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DEVELOPMENTAL DIFFERENCES IN PRESCHOOLERS' COMPREHENSION OF WH-QUESTIONS

DISSERTATION

Presented in Partial Fulfillment of the Degree of Doctor of Philosophy in the Graduate School of The Ohio State University

By

Gregory Ernest Bell, B.A., M.Ed.
The Ohio State University
1984

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[Signature]
Department of Educational Theory and Practice
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1984
DEDICATION

For my wife, Beverly, without whose encouragement, patience, understanding, and love this dissertation would not have been possible. Also to my beloved, deceased committee member, Dr. Alvia Bozeman whose guidance and spiritual support provided the motivation necessary to complete this dissertation. I'll always remember one of her favorite sayings:

Oh God, give me the guidance to know when to hold on and when to let go. And give me the grace to make the right decision at the right time in the right way.
ACKNOWLEDGEMENTS

Without the guidance, encouragement, and support of many individuals this dissertation would not have been possible. I am deeply indebted to my advisor, Dr. Roger T. Cunningham, who was very personal and professional in providing his diligent guidance. He was continuously open-minded and supportive throughout the entire process. I am most grateful to my other committee members, Dr. Marlin Languis and Dr. Lorren Stull, also to my Graduate Representative, Dr. Penelope Griffing for their scholarly advice and support.

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Finally, through love, devotion, and continuous support from my parents, in-laws, and other relatives, I was encouraged to complete this dissertation. They will always have my enduring gratitude.
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PUBLICATION

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CHAPTER I

STATEMENT OF THE PROBLEM

Introduction

Recent development in education has placed heavy emphasis on trying to identify specific competencies that a teacher should possess. According to Carin and Sund (1978) people often rank as primary importance the teacher's ability to interact with students in personal, humane ways. Studies of teacher-student interactions have shown that teachers spend 70 to 80 percent of their time asking questions. The assumption is that students understand these questions and have the ability to give appropriate responses. A question is a verbal utterance that seeks a response from the person to whom it is directed (Cunningham, 1972, p. 85).

Several scholars have stressed the importance of asking and using questions in the classroom (Sanders, 1966; Bossing, 1942; Hunkins, 1972; Hildebrand, 1976; Bloom, 1972). Traditionally, questions have been used to determine what students have already learned. As Cunningham (1972) indicates questions asked and used in an effective way facilitate development of desirable attitudes, develop and sustain interests, provide new ways of dealing with subject matter, and give quality and purpose to evaluation (p. 85).
Although the literature related to teachers' question-asking behaviors is extensive, relatively few studies have focused on preschoolers' comprehension of questions, specifically, wh-questions (Ervin-Tripp, 1970; Cairns and Hsu, 1978; Tyack and Ingram, 1977; Gullo, 1979; 1982). The present investigator defines a wh-question as a verbal utterance that begins with an interrogative term such as "who", "what", "why", "where", and "when" that seeks a specific type of response. Examples of wh-questions are as follows.

"Who is the dog jumping?"
"What is the girl jumping?"
"Why is the boy running?"
"Where is the girl jumping?" and
"When is the boy jumping?" (Gullo, 1979, p. 68).

In previous wh-question comprehension studies the objectives were to examine: 1) the sequence in which preschoolers correctly responded to wh-questions (Ervin-Tripp, 1970; Tyack and Ingram, 1977; Cairns and Hsu, 1978; Gullo, 1979; 1982), 2) any possible patterns of correct/incorrect responses to wh-questions (Tyack and Ingram, 1977; Cairns and Hsu, 1978; Gullo, 1982), and 3) any differences between White middle and low socioeconomic status (SES) preschoolers' responses to wh-questions (Gullo, 1979; 1982).
In these previous studies various modes of pictorial stimuli were administered in order to assess the preschoolers' ability to comprehend the wh-questions. For example, Erwin-Tripp (1970) used a picture book; Tyack and Ingram (1977) utilized photographs; Cairns and Hsu (1978) administered video-tapes, while Gullo (1979; 1982) presented black and white line illustrations as the stimulus for examining questions and response patterns.

In general, the previous studies of question comprehension have revealed: 1) the developmental sequence in which children correctly respond to wh-questions is who, what, where, why, how, and when (Erwin-Tripp, 1970; Tyack and Ingram, 1977; Cairns and Hsu, 1978; Gullo, 1979; 1982), 2) there is a developmental difference in preschoolers' ability to answer wh-questions. As children become older their ability to comprehend wh-questions increase (Erwin-Tripp, 1970; Tyack and Ingram, 1977; Cairns and Hsu, 1978; Gullo, 1979; 1982), 3) certain response strategies are employed when giving correct/incorrect answers to wh-questions (Tyack and Ingram, 1977; Cairns and Hsu, 1978; Gullo, 1979; 1982), 4) there are differences between the White middle and low socio-economic status (SES) preschoolers' ability to correctly respond to wh-questions (Gullo, 1979; 1982), and 5) the amount of information present in a pictorial stimuli has an impact on the
preschoolers' ability to correctly respond to wh-questions (Gullo, 1979; 1982). A more detailed discussion of these question comprehen-
sion studies is presented in Chapter II.

Purpose of the Study

What are good questions? Cunningham (1972) writes:

Good questions make provisions for different levels of thinking. A good question can be judged by its clarity. A question that is clearly posed, leaves no doubt of its purpose, and is stated with a sensibie word order is much more successful than one without these characteristics.... A good question provides for reflective and critical thinking; to do so, it should relate meaningfully to the experiences of the persons being questioned - familiar terms and examples make this possible. Good questions facilitate the accomplishment of goals set by the teacher. The attainment of behavioral objectives for an instructional unit by a group of learners depends very heavily on the quality of questions in the program, since a good question provides suitable guidelines for the pupil to form a meaningful response. Therefore, the quality of a question is very much a part of the way it is phrased (p. 85).

The investigator highly motivated by Cunningham's (1972) descriptive characteristics of a "good" question reexamined the literature related to preschoolers' comprehension of wh-questions. Inspection of this literature revealed that the studies regarding preschoolers' comprehension of wh-questions have provided a very meaningful source of knowledge to the early childhood field. The
following concerns led this investigator to research the notion of preschoolers' comprehension of wh-questions further. First, there is no empirical evidence that has been documented which has focused on Urban Black preschoolers' ability to comprehend wh-questions in previous question comprehension studies (Ervin-Tripp, 1970, Cairns and Hsu, 1978; Tyack and Ingram, 1977; Gullo, 1979; 1982). Secondly, although Gullo's (1979; 1982) research design was well constructed, there were too many pictures (a total of 45) administered to preschool children between the ages of 3.6 - 5.0 years old in an attempt to assess their ability to comprehend wh-questions. It is this investigator's belief that the preschoolers' ability to answer the wh-questions is Gullo's (1982) study may have been influenced by two factors: 1) the wh-word type being asked and 2) the number of pictures presented in a 20 minute testing session. This contention is based upon the short attention span of preschool children. A pilot study was conducted to test this notion further (see Chapter III for results).

The primary purpose of this study is to ascertain whether there are developmental differences between Urban Black preschool children between the ages of 3 and 5 years old in their ability to appropriately respond to wh-questions. No attempt in this study is made to compare social class differences among the
subjects. A secondary purpose of this investigation is to determine whether certain response patterns are employed when appropriate/inappropriate responses are given to wh-questions.

The investigator believes that in order to examine preschoolers' comprehension of wh-questions a review of the literature relative to how children learn (Models of Learning), how language is developed (Stages of Language Development), and how children's perceptual skills develop (Children's Perceptual Development) is warranted. The preceding bodies of research will be discussed in Chapter Two - Literature Review.

Research Questions

Group I:

When pictorial stimuli are presented are there any differences in Urban Black preschool boys and girls between the ages of three and five years, rate of appropriate responses to oral wh-questions who, what, why, where, and when based on the following factors:

a. age group?

b. sex differences?

c. stimulus options (single or multiple) present in the pictorial situations?

d. order of stimulus presented first?

e. wh-word type?

f. interactions of any of the above factors?
Group II:

Are there any differences in the response types to why, where and when questions which can be attributed to age level?

Group III:

Are there any possible patterns that can be determined based on the frequency of inappropriate responses to oral who, what, why, where, and when questions?

Quantitative Hypotheses

Group I:

There is a difference in Urban Black preschool boys and girls between the ages of three and five years, rate of appropriate responses to oral wh-questions (who, what, why, where, and when) when pictorial stimuli are presented based on the following factors:

a. age group (Early 3's; Late 3's; Early 4's; Late 4's)
b. sex differences (Male or Female)
c. stimulus options (single or multiple) present in the pictorial situations
d. order of presentation of the two stimulus options (single first or multiple)
e. wh-word type (who, what, why, where, when)
f. interactions of any of the above factors.
Qualitative Hypotheses

Group II:

There is a difference in the two-way frequency patterns for four response types to why, where, and when questions when pictorial stimuli are presented to Urban Black preschool boys and girls between the ages of three and five years old.

Group III:

There is a pattern of inappropriate responses to wh-questions (who, what, why, where, and when) that can be determined when pictorial stimuli are presented to Urban Black preschool boys and girls between the ages of three and five years old.

Definition of Terms

Preschoolers. For the purpose of this study, refers to Urban Black children between the ages of three and five years old.

Independent Variables. There are five independent variables in this study: 1) age (which had four levels: 3.0-3.5; 3.6-3.11; 4.0-4.5; and 4.6-4.11); 2) sex (which had two levels: male and female); 3) order of presentation (which had two levels: single option stimulus first or the multiple option stimulus first); 4) quantity of stimulus option (which had two levels: single option stimulus and the multiple option stimulus); 5) wh-word
type (which had five levels consisting of: who, what, where, why, and when).

Dependent Variables. In this study, the appropriate responses to the wh-questions were the dependent variables.

Wh-words. In this study, refers to those words which are placed at the beginning of each stimulus question, such as who, what, where, why, and when (Gullo, 1982; Tyack and Ingram, 1977).

Information. In this study, is defined as the number of options provided to the children in picture form as possible answers to questions (Gullo, 1982).

Single Option Stimulus Condition. In this study, refers to pictures designed such that only the information to answer the wh-questions is presented.

Multiple Option Stimulus Condition. In this study, refers to pictures designed such that more than one type of wh-question could be answered from the information presented (Gullo, 1982).

Stimulus questions. In this study, refers to those wh-questions which begin with the wh-word such as who, what, where, why, and when that are asked of preschoolers to test their comprehension of wh-questions.

Verbs. In this study, refers to those words which depict action such as running and jumping, that are used in the
pictures/questions presented to the preschooler (Gullo, 1982).

**Nouns.** In this study, refers to those words which depict names of people or objects, such as boy, girl, and dog that are used in the pictures/questions presented to the preschooler (Gullo, 1982).

**Pictorial stimuli.** In this study, refers to the black and white drawings used (Gullo, 1982).

**Appropriate responses.** In this study, refers to those responses that a child gives to the wh-questions which meet the criteria described by Tyack and Ingram (1977). (See Data Analysis section for details.)

**Response types.** For the purpose of this study, refers to those responses that a child gives to specific wh-questions (why, where, when) which meet the criteria described by Carins and Hsu (1978). (See Data Analysis section for details.)

**Confusion response.** In this study, refers to an inappropriate response to a wh-question which a child gives to represent another wh-question response, as described by Tyack and Ingram (1977). An example of a confusion response would be when a child gives a "what" response to a "who" question.

**Language.** In this study, refers to the verbal or nonverbal (pointing) responses that a child uses to answer the wh-questions.
Assumptions

1. There is a high frequency of wh-questions asked by some preschool teachers.
2. The statistical procedures used to analyze the data are appropriate.
3. Preschool teachers regularly use visual stimuli to encourage their students to talk.

Limitation

This study was limited to eighty Urban Black preschool children in four Head Start centers in Columbus, Ohio. They ranged in ages from 3.0-5.0 years. This study can not be generalized other than to this population.

Design of the Study

The present investigation is a pre-experimental design, one-shot case study, in which a single group of subjects is studied only once, as described by Campbell and Stanley (1963, p. 6). The independent variables were age, sex, order of presentation, quantity of stimulus, and wh-word type. The dependent variables were the stimulus responses to the wh-questions.

There are three major components in the present investigation. First, the quantitative component examines the rate of appropriate responses to five oral wh-questions (who, what, why, where,
and when) by preschoolers between the ages of 3.0 and 5.0 years. The second component investigates the type of responses that are given when answering three selected wh-questions (why, where, and when). The third component examines which wh-words are most often confused with other wh-words when responding to wh-questions (who, what, why, where, and when).

It is important to note that the last two components in this study focus on qualitative differences, therefore, no statistical analysis is administered.

**Organization of Dissertation**

Chapter One presented the introduction of the problem, the purpose of the study, and the hypotheses. The literature related to this study is reviewed in Chapter Two. The collection method and the analysis procedures are presented in Chapter Three. The data analysis and discussion are discussed in Chapters Four and Five.

**Summary**

Chapter One began with an introduction to the problem which motivated the investigation of this study, followed by the purpose of the study. The hypotheses were presented to address both the quantitative and qualitative components of the study. The definition of terms, assumptions, limitations, and the design of
the study followed. A chapter by chapter summary was presented to indicate what each section of this dissertation represents. In Chapter Two, a review of the literature related to the present investigation is presented to develop a basis for understanding the developmental characteristics of preschoolers.
CHAPTER II
LITERATURE REVIEW

Introduction

In order to adequately address the major thrust of this study, which is to investigate preschooler's comprehension of wh-questions, with specific emphasis on their responses, the investigator contends that the review of the following literature is warranted. An investigation of the learning process with respect to the generative learning model and the hemispheric brain model are presented to provide a basis for understanding how children learn and process information. Another area of interest presented is the literature related to children's perceptual development which provide insight into how children process pictorial stimuli. A review of the literature related to stages of language development is presented to grasp an awareness of how children acquire spoken speech. In the final section, a review of the existing wh-question studies is presented.

Therefore, an examination of this chapter will provide the reader with literature related to:

The Learning Process (The Generative Learning Model
The Hemispheric Brain Model)
Information Perceived by the Brain
Children's Perceptual Development
Language Development
Comprehension of Wh-Questions

The Learning Process

The Generative Learning Model

For several years scholars have been interested in exploring how children learn. Piaget (1962) refers to learning as an active process. He argues that a child builds up knowledge by actively constructing his own perceptions about the world throughout many interactions with his environment. He also proposes that a child learns by a process of assimilation and accommodation. Assimilation is the interpretation of a new object or experience in accordance with ideas or experiences that the child has already acquired. Accommodation requires the modification of the child's ideas about the world to take into account new information (Segal and Manburg, 1981, p. 15).

Bruner (1975) maintains that a child learns about his environment by acting on or reacting to environmental stimulation. Wittrock (1977) stresses the importance of imagery in the learning process. He contends that a child learns by actively constructing meaning of new stimuli related to existing knowledge.
Proponents of the generative learning model maintain that the learner be introduced to ideas so that he can use them with knowledge that has already been acquired. They suggest that the teacher can tell the learner answers, but the learner must use his own construction process before meaning can occur for him.

In summary, proponents of the generative learning model argue that the learner "must" actively engage in the thought process in order for learning to be meaningful. In the next section the hemispheric brain model is discussed.

The Hemispheric Brain Model

An area of brain research which shows great promise for educational innovation is that of hemispheric specialization. The brain's neocortex is divided into two anatomically similar hemispheres, resembling a large soft walnut. These halves (right and left) are joined by a bundle of connecting nerve fibers called the corpus callosum. Myelination of these fibers is complete at about age nine or ten, allowing the hemispheres to share information and its processing (Johnson, 1982, p. 43).

For years several studies have focused on the anatomical and functional differences of the two halves of the brain (Broca, 1861; Wernicke, 1876; Berlin, 1978; Wittrock, 1980; Kraft, 1977; Languis, Sanders, and Tipps, 1980). In these studies terms such as
"hemispheric lateralization", and "hemisperhic asymmetry" are synonymously used to refer to the anatomical and functional differences between the two hemispheres of the human brain. The functional differences are based upon processing differences. In general, the right hemisphere uses an analytical, gestalt mode of processing appropriate to visuo-spatial and musical tasks; while the left hemisphere uses a logical, analytical mode of processing suitable to verbal tasks (Berlin, 1978, p. 10).

The following list developed by Coulter (1981) comprehensively summarizes the differences between the information processing systems of the human brain:

<table>
<thead>
<tr>
<th>Right Hemisphere</th>
<th>Left Hemisphere</th>
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<td>Intuitive</td>
<td>Logical</td>
</tr>
<tr>
<td>Holistic</td>
<td>Sequential</td>
</tr>
<tr>
<td>Divergent</td>
<td>Convergent</td>
</tr>
<tr>
<td>Inclusive</td>
<td>Exclusive</td>
</tr>
<tr>
<td>Synthesizing</td>
<td>Analyzing</td>
</tr>
<tr>
<td>Multiple Implications</td>
<td>Either/or</td>
</tr>
<tr>
<td>Creative</td>
<td>Decision making</td>
</tr>
<tr>
<td>Consequences of decisions</td>
<td>Right or wrong (Johnson, 1982, p. 43).</td>
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</table>

Languis, Sanders and Tipps (1980) contend that the two processing systems represented by the right and left hemispheres of the brain are both needed for optimal learning.

Berlin (1978) argues that a young child's brain up and through the age of eight years old functions essentially like
that of a split-brain individual. She also indicates that sex differences with regard to brain specificity becomes routine and reliable by age ten.

Another basic difference between the two hemispheres is that they develop differing, but complementary, abilities (Johnson, 1982, p. 45). The following list developed by Coulter (1981) comprehensively illustrates the way information is perceived by the human brain:

**Information Perceived by the Human Brain**

<table>
<thead>
<tr>
<th>Right Hemisphere</th>
<th>Left Hemisphere</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. visual images-pictures</td>
<td>1. abstract-symbols</td>
</tr>
<tr>
<td>2. language-verbal</td>
<td>2. language-verbal</td>
</tr>
<tr>
<td>a. expression</td>
<td>a. alphabet</td>
</tr>
<tr>
<td>tone</td>
<td>words (spelling)</td>
</tr>
<tr>
<td>intonation</td>
<td>sentences (syntax)</td>
</tr>
<tr>
<td>b. body language</td>
<td>b. reading</td>
</tr>
<tr>
<td>gestures</td>
<td>speaking</td>
</tr>
<tr>
<td>facial expression</td>
<td>writing</td>
</tr>
<tr>
<td>c. logos-pictorial symbols</td>
<td></td>
</tr>
<tr>
<td>3. language-mathematical</td>
<td>3. language-mathematical</td>
</tr>
<tr>
<td>a. spatial</td>
<td>a. numerals</td>
</tr>
<tr>
<td>shapes</td>
<td>operations</td>
</tr>
<tr>
<td>b. geometry</td>
<td>(basic facts)</td>
</tr>
<tr>
<td>shapes-relationships</td>
<td>b. computation</td>
</tr>
<tr>
<td>c. patterns</td>
<td>addition, subtraction,</td>
</tr>
<tr>
<td>d. relationships</td>
<td>multiplication, and</td>
</tr>
<tr>
<td></td>
<td>division</td>
</tr>
<tr>
<td>4. creativity</td>
<td>4. logic</td>
</tr>
<tr>
<td>5. melody</td>
<td>5. rhythm</td>
</tr>
<tr>
<td>6. time-cyclical</td>
<td>6. linear time</td>
</tr>
<tr>
<td>a. seasons</td>
<td>a. seconds-minutes-hours-</td>
</tr>
<tr>
<td></td>
<td>days-weeks-years</td>
</tr>
<tr>
<td>7. functions</td>
<td>7. definitions</td>
</tr>
<tr>
<td>8. images-pictures</td>
<td>8. labels (Johnson, 1982, p. 43)</td>
</tr>
</tbody>
</table>
There has been a developmental aspect identified that is related to hemispheric specialization. Kraft (1977) found that when children were presented with Piagetian tasks, the right hemisphere was activated first. When they had processed the information, activity switched to the left hemisphere as they answered the questions. She indicates that the right to left preference seems to dominate until the person has absorbed enough sensory information about the task at hand (Johnson, 1982, p. 45).

One final area of brain research that the investigator believes has great promise for educational practices is that of Epstein's (1979) brain growth spurts. Epstein found evidence of brain growth spurts, at similar predictable ages as described by Piaget in his Cognitive Development Theory - Sensorimotor Period (birth-2 years), Preoperational Period (2-7 years), Concrete Operational Period (7-11 years), Formal Operational Period (age 11 through adult). A look at neuron development and performance also reveals evidence that correlates with the cognitive processes described by Piaget and may account for the Epstein's growth spurts (Johnson, 1982, p. 41). (For a more comprehensive summary of Epstein's brain growth spurts refer to Coulter's text in the reference section.)
In conclusion, Lyons (1982) presents a summary of the extensive research concerning the specialized roles of the cerebral hemispheres. She indicates that the general consensus among researchers who have studied hemispheric and lateral specialization may be summarized as follows:

1. The two cerebral hemispheres function as one: Various parts of each hemisphere are conjointly active. Each cerebral hemisphere receives the same information and processes it in its own specialized mode. Therefore, we have two different modalities for processing information (Bogen, 1969).

2. The two cerebral hemispheres are capable of functioning independently in some degree ... (Bogen, 1969).

3. The two cerebral hemispheres may be logically incompatible. The right hemisphere synthesizes over space, while the left hemisphere analyzes over time. The right hemisphere notes visual similarities to the extension of conceptual similarities, while the left hemisphere does the reverse. The right hemisphere codes sensory input in terms of images, while the left codes in terms of linguistic descriptions (Levy, 1974).

4. Individuals are capable of engaging in both modes of information processing, however, the mode an individual actively uses depends on other variables (i.e., personal intention, salient features of the experience, instruction, habitual reliance on one type of processing) (Languis, Sanders, and Tipps, 1980, pp. 26-27).

In the next section, the literature related to how children approach perceptual and intellectual activities is presented.
Children's Perceptual Development

Research in cognitive style provides a basis for understanding how individuals approach perceptual and intellectual activities (Witkin, 1962). Goldstein and Blackman (1978) define cognitive style as the characteristic way in which individuals conceptually organize their environment.

Witkin (1962) proposes a field-dependent - independent construct in an attempt to explain how individuals approach spatial-learning experiences. He defines field-dependence as the cognitive tendency to submit passively to influence of the prevailing background and the inability to keep an item separate from its surroundings. Witkin suggests that an individual with a field-dependent way of perceiving information tends to experience his surroundings in a relatively global manner, passively conforming to the influence of the prevailing field or context. The investigator believes that a field-dependent person tends to use his right hemisphere mode of processing most often (Lyons, 1982, p. 10).

In contrast, Witkin defines field-independence as the cognitive tendency to differentiate objects from the background. He indicates that an individual with a more field-independent way of perceiving information tends to experience his surroundings analytically, with objects as discrete from their background. The investigator
believes that a field-independent person tends to use his left hemisphere mode of processing most often (Lyons, 1982, p. 10).

Piaget (1962) proposed a theory of perceptual development that has served as a meaningful and rich source of knowledge for the field of education and psychology. Perception is not an innately fixed mechanism for registering stimuli, but is a "developing" system which becomes increasingly adaptive with age. In the young child perception is passive and dominated by the "best" organization of the visual field. With the development of perceptual operations (internalized action), however, the child's perception becomes active and spontaneously restructures the field into its many possible organizations (Piaget, 1962, p. 16).

Smart and Smart (1973) comprehensively summarized the characteristics of preschool thinking. They write: A child's thinking is egocentric and is dominated by perceptions. They suggest that he is greatly influenced by what he sees, hears, or otherwise experiences at a given moment. Literally, "seeing is believing".

The static picture is what the child believes; he does not pay attention to transformation or changes from one stage to another. They further suggest that what he perceives at any one
time is, however, not what a more mature person would perceive (p. 75).

The Stanford-Binet test shows that the preschool child's typical response to pictures is the naming of figures in them, while the child of 6 or 7 and 11 or 12 tells about actions as well and the child over 12 gives a theme. Thus the conceptualizing of pictures develops from simple and concrete to abstract and complex (Smart and Smart, 1973, p. 77).

With regard to the development of visual exploration, Piaget (1962) suggested that children at the preoperational level (2-7 years old) are more likely than children at the concrete level (7-11 years old) to fix attention or "center" on the most compelling aspects of a stimulus display to the exclusion of other less striking aspects of the visual field (p. 178). This notion described by Piaget is referred to as the "centration hypothesis".

Elkind, Doornick and Schwarz (1968) sought to demonstrate that the perceptual activities which Piaget described with respect to geometric illusions were also operative with respect to figurative materials. Their findings indicate that the ability to perceptually recognize pictorial materials improved with age as predicted by Piaget's theory (Elkind, 1964; Elkind and Scott, 1962).
In conclusion, the overall results of the perceptual development studies reveal that younger children performed at a compatible level with older children when knowledge of background features were not necessary for accurate performance, but they performed more poorly than older children when knowledge of background information was necessary for accurate performance. In general, these findings suggest a tendency in young children to "center" on the figure to the detriment of the ground. Older children, in contrast, appear to be able to "decenter" and to respond to the peripheral as well as the "central features" of a display.

In the following section, a review of the literature related to the stages of language development is presented.

Stages of Language Development

Chomsky's (1957) Theory of Generative Transformational Grammar's major purpose was to describe children's language in terms of an adult's system of grammar. However, during the 1970's research regarding children's language focused on two major areas: 1) language content (semantics) and 2) language use (pragmatics and contexts). The major goal of research regarding children's language was to focus on the nature of their communication (Gullo, 1979). A brief discussion of each research area is presented.
The first direction in children's language research was based on the "semantic approach". The major goal of this research direction was to move away from the adult grammatical (form) descriptions of children's speech (Chomsky, 1957), toward a view that the child's own meanings are the core units of language structure (Clark, 1973; Palermo, 1978; Moerk, 1977; Bowerman, 1973; Brown, 1973). In general, the semantic approach to children's language led to several demonstrations that their language has its own structure that is based on the child's own meaning. Proponents of the semantic approach suggest that a child acquires meaning of language out of the interaction between the adult's knowledge of the world and the context: the persons, objects, and events that are around the child (Bates, 1976; Nelson, 1973, 1974; McNeil, 1970; Moerk, 1977).

The second approach in children's language research and the primary area of concern for this investigation has been in the area of language use (Gullo, 1979). Proponents of language use research have examined language primarily as a "social tool for communication" rather than looking at language in terms of systematic structures or semantic units. Theorists of language use suggest that the communicative purposes of an utterance are more essential than the

Language use has two major components: 1) pragmatics and 2) context. Child language has been defined in terms of pragmatics (Halliday, 1973; Bates, 1976; Dale, 1972; Moerk, 1977). Pragmatics refers to the way language functions in social settings.

Halliday (1973) in studying the social functions of children's language found that many of the early developing language functions could be executed nonverbally as well as verbally. Among the seven functions that Halliday identified (informational, regulatory, interactional, personal, heuristic, imaginative, and informative) the first six had appeared in a nonverbal protolanguage style (Gullo, 1979).

In regards to the notion of "nonverbal communication," Robison (1983) suggests that physical communication such as touching, gestures, uttering sounds, and moving are important in establishing rapport and common understanding among young children. She also indicates that teachers usually verbalize most messages, but they clarify messages by "pointing out" directions or expectations, and using facial expressions to convey feelings. Young children often convey more of their messages physically than
verbally, even those who are highly articulate (Robison, 1983, p. 309).

Children can understand and act on far more speech than they use, an observation that is true for almost any age group (Chomsky, 1972; Robison, 1983; Stalling, 1975). In short, receptive language is always greater than productive language. The investigator maintains that such models of language functions are not models of how the child learns language, thus the remaining portion of this section will focus on how language is developed.

Bruner (1975) suggests that the child acquires language through the rehearsal of sounds he hears in his environment, along with interactions between himself and a particular person or persons in his environment. He also suggests that a child learns language just as he learns other activities, by becoming able to actively engage in the language and/or activity with a significant adult/person (Bertrand, 1984).

Several scholars have identified distinct stages that a child goes through in the acquisition of spoken language. Dale (1972) indicates that the first stage of a child's spoken language is holophrastic speech, in which a single word carries many meanings for the child. He also suggests that holophrastic utterances are strongly linked to actions, particularly the child's own
actions. The second stage is referred to as telegraphic speech in which two and three word utterances are used to convey a message. This stage of speech marks the beginning of syntax; however, the emphasis is still placed on the meaning intended (Brown and Bellugi, 1964). This stage is referred to as telegraphic speech because words are omitted that do not carry meaning, similar to a telegram message.

Piaget (1962) identified two major categories of speech. The first is called egocentric speech: speech whether uttered in solitude or in the presence of others can be judged to lack a primary communicative intent. There is no real attempt to take the role of the listener into account (hence the term egocentric) or to adapt the message to his informational level. The second category is socialized speech, which includes those utterances that do appear to possess genuine communication aims.

Piaget distinguished three subclasses of egocentric speech (repetition or echolalia, monologue, collective monologue). The category of most importance for the present study is the repetition or echolalia speech of a child. In this stage of speech, the child repeats for his own pleasure, his own utterances, and those of others. This even comes in the context of a conversation. Halliday (1969) suggests that such speech serves as a personal
function, where the child expresses his unique views, feelings, and attitudes, through language (personal function). She suggests that through language a child establishes his personal identity.

Bates (1976) identified three stages in which children progress in developing their speech (purlocutionary, illocutionary, locutionary). During the purlocutionary stage, the "cry" is utilized to convey a child's message; while nonverbal gestures (pointing and touching) are utilized in the illocutionary stage; and spoken words are employed during the locutionary stage to convey messages (Gullo, 1979).

Vygotsky (1962) suggests that the history of the society in which a child is reared and the child's own developmental history in terms of his experiences in that society are both extremely important in facilitating the ways he will be able to think. He further suggests advanced modes of thinking - conceptual thinking - must be transmitted to the child by means of words, thus language becomes a critical tool for deciding how children learn to think (Thomas, 1979, p. 32). According to Vygotsky spoken speech includes the following stages (primitive, naive, egocentric, and ingrowth). His stages of speech parallels that of Piaget's which both place heavy emphasis on the cognitive component of a child's
experiences. Both theorists stress the importance of the child's "active" engagement with users of language.

In conclusion, as the child grows up in an environment with language all around him, he is faced with the task of what language means and how it works. Through continual interactions with other language users, and through concrete experiences he has had, he forms hypotheses about what language can do for him. Continual interaction with members of the child's environment produces a child who, by the age of five, has become a very competent language user, capable of generating his own thoughts into language structures others can understand (Vygotsky, 1978). Thus, the process of acquiring oral language is one of learning and using language in context. In short, "language does something and means something" (Halliday, 1973, p. 2).

In the next section, a review of the literature related to children's comprehension of wh-questions is presented.

Preschoolers' Comprehension of Wh-Questions

Ervin-Tripp's (1970) study was the first detailed investigation that focused on the comprehension of questions by young children. She reports that the developmental acquisition with which children correctly respond to wh-questions is what, where, whose, whom, who, how and when. Ervin-Tripp attributed this developmental
order of responses to the varying syntactic complexity required to answer the questions, varying cognitive complexity required to answer the questions, varying cognitive complexity related to the various wh-question words, and varying degree of abstractness related to the wh-word types (Gullo, 1979, p. 736). The kinds of errors the children made revealed some difficulties in the processing of the questions. If a child had not yet acquired the meaning of a particular wh-question word, he would process it as if it were one that was known. For example, the question "Why is the dog drinking?" might receive a nominal answer as if the question had been "What is the dog drinking?" (Ervin-Tripp, 1970; Tyack and Ingram, 1977).

Tyack and Ingram (1977) indicated that Ervin-Tripp's (1970) study was a major breakthrough in our knowledge of how children comprehend questions. However, they suggested that there were at least two aspects that required further study. First, further work was needed to establish the order of acquisition of the wh-form and the kinds of errors that are made. In Ervin-Tripp (1970) study only four questions were used per question-word and very few verbs were selected. Since the semantics of the verbs proved to be so important, further control of them needed to be attempted.
Secondly, it may be likely that the context of the questions suggested one particular response over another.

Ervin-Tripp (1970) mentions that this was an inherent problem in her study, and that there is a need for more ambiguous contexts so that children have to process the sentence. They further indicate that, "we do not have such ideal data, and in the free-text questions are often asked in just those situations most likely to produce categorically correct answers" (p. 214). Thus, Tyack and Ingram sought to discover more about children's production and comprehension of questions with the work of Smith (1933) and Ervin-Tripp (1970) providing the point of departure. Their major objectives were to determine whether there is a consistent order of acquisition in which the different types of wh-questions are understood and whether there are any general strategies that children follow in responding to wh-questions.

In Ingram and Tyack's (1977) comprehension study the children were between the age of 3 and 5 years old. In contrast to the picture book used by Ervin-Tripp (1970), photographs were used by Ingram and Tyack (1977) as the pictorial stimuli to elicit the children's responses. The results of their study indicate 1) that the frequency of correct response increased with the age of the children and 2) when children made mistakes, their responses were
not random, but appeared to be following certain question-asking strategies. These included attention to semantic features of verbs as well as the placement of the verbs in the sentence.

In the earlier wh-question comprehension studies a variety of pictorial stimuli has been utilized (picture book, photographs, videotapes) to determine how well children understood the questions. Gullo (1981) decided to vary the amount of information presented in the stimuli in order to determine whether the salient (striking or compelling) information contained in the pictures affected children's ability to comprehend wh-questions, thus extending the findings of the earlier study (1979).

In his follow-up study (1981) there were two levels of stimuli presented to the children. One stimulus condition presented the subjects with 15 pictures designed such that more than one type of wh-question could be answered from the information presented (Multiple Option Stimulus Condition). This was the same as the stimulus condition used in the earlier study (Gullo, 1979). A second stimulus condition was used which presented the subjects with 30 pictures designed such that only the information to answer the stimulus questions were presented (Single Option Stimulus Condition).
The study consisted of children between the ages of 3-5 years old. The goal of the study was to determine whether there were social class differences between middle and low socioeconomic status (SES) White preschoolers' comprehension of wh-questions. He found that differences in question comprehension varied according to which wh-word was the target word. He suggested that for wh-words which are acquired earlier (what, who, where) and whose referents are observable objects easily identifiable in pictures, SES differences were nonsignificant. In contrast, the later acquired wh-words (why, how, when) which require the abstract referents of cause-effect, time, and manner, respectively, SES differences were pronounced. In short, the findings indicate that the middle-SES children comprehend significantly more of these types of questions (why, how, when) than low-SES children. According to Gullo (1982), the basis for such difference was indicated by Gullo (1981) to be due to language use differences between the two groups.

In addition, two other findings were revealed in Gullo's (1982) study: 1) wh-questions such as (why, where, how, when) received a great deal of "ritualistic" responses. For example, when a child was asked, "Why is the boy running?", the response was "because". The same response pattern occurred for "where" questions which
received "here", "there" responses; "when" questions received "now" responses and "how" questions received "fine" or "good" responses (Cairns & Hsu, 1978); and 2) "what" responses were given to describe the object observed in the picture when the child did not know the appropriate answer to the question. For example, a "When is the dog jumping?" received a "dog jumping" response as if the question asked was "What is the dog doing?" (Tyack and Ingram, 1977).

In conclusion the writer has attempted in this section to present the findings of previous studies relative to preschoolers' comprehension of wh-questions. However, there is a need to expand our knowledge by investigating the Urban Black preschoolers' ability to comprehend wh-questions. Currently, there is no empirical evidence available which has examined this cultural group. In Chapter III the methodology and procedures are presented which were used to conduct the present investigation.
CHAPTER III
PROCEDURES

Introduction

Six major sections are presented in this chapter. The initial section, Preliminary Procedures discusses the objectives and results of the pilot study which led to the design of this present investigation; the second section, Selection of Sample presents the procedures used to select the participants; the third section, Data Collection, General Procedures discusses the testing procedures used for the two treatment groups; the fourth section, entitled Instrumentation discusses the types of pictures, questions, and instructions used; the fifth section, Data Scoring Procedures presents the manner in which the children's responses were scored; and the sixth section, Methods of Analysis Procedures discusses the methods used to analyze the quantitative and qualitative components of this study.

Preliminary Procedures

Pilot Study

During the Spring Quarter of 1983, a pilot study was conducted to determine:
1. whether the nouns and verbs selected were easily understood by each age group. The preschoolers were asked to a) name the subject(s) (boy, girl) and the object(s) (rope, box) in the pictures and b) to describe the specific action(s) depicted in the pictures (running, jumping).

2. the sequence in which the preschoolers appropriately responded to the wh-questions. The criteria used for scoring responses is presented in the Data Scoring Procedure section - Group I which is discussed later in this chapter.

3. whether certain response patterns were employed by the preschoolers when responding to selected wh-questions such as why, where, and when. The criteria used for scoring categories of response types is presented in the Data Scoring Procedure section - Group II which is discussed later in this chapter.

4. which wh-words are confused with other wh-words when responding to wh-questions.

5. whether the amount of information presented in the pictures affected the frequency of appropriate responses.

6. whether the amount of appropriate responses are different between boys and girls.

7. whether the number of pictures presented in each session were adequate for preschoolers' attention span.

8. whether using a "focusing" (pointing strategy) facilitated more appropriate responses in the Multiple Option Stimulus Condition.

There were 18 Urban Black preschoolers selected from three local Head Start centers in Columbus, Ohio to participate in the pilot study. The sample group consisted of 9 boys and 9 girls.
Children's parents provided written consent for them to participate in the study at a parent meeting held by the investigator. The children also were able to decide whether or not to participate by responding to the question "Would you like to look at some pictures and answer some questions as to what you see in the pictures?"

Each child was tested individually in approximately 20 minutes. The following instructions were given:

WE ARE GOING TO LOOK AT SOME PICTURES. THE PICTURES ARE ABOUT PEOPLE AND ANIMALS DOING DIFFERENT THINGS LIKE EATING, RUNNING, JUMPING, AND HELPING. I AM GOING TO ASK YOU SOME QUESTIONS ABOUT THE PEOPLE AND ANIMALS IN THE PICTURES. IF YOU DON'T KNOW WHAT IT IS YOU CAN ASK ME. DO YOU UNDERSTAND WHAT WE ARE GOING TO DO? OKAY, HERE IS THE FIRST PICTURE. LOOK AT THE PICTURE AND TELL ME "________." (Gullo, 1979, p. 123).

There were two treatment groups in the pilot study, Group A, consisting of 9 subjects received the Single Option Stimulus first, and then the Multiple Option Stimulus, while Group B, consisting of 9 subjects received the Multiple Option Stimulus first, followed by the Single Option Stimulus. A Single Option stimulus refers to a picture designed such that only the information to answer the stimulus question is presented. In contrast, a Multiple Option Stimulus Condition refers to a picture designed such that more
than one type of wh-question could be answered from the information presented.

There were 15 Multiple Option Stimulus pictures and 30 Single Option Stimulus pictures presented during the testing sessions. The pictures chosen were the same as those used in Gullo's (1979; 1981) study. The only change was that some of the pictures were modified to depict a "multi-cultural portrayal of Black and White Americans, rather than only one cultural group. (The rationale for this change is presented in the Instrumentation section of Chapter III).

All of the nouns and verbs selected for the pilot study appeared commonly across Dolch's word lists, Fry's (1957) First 300 words, and Stone's (1950) word list. The nouns used were "boy", "girl", "man", "lady", "horse", "dog", "cat", and "wagon". The verbs chosen were "jump", "help", "run", "eat", "ride", and "touch".

There were a total of 45 wh-questions asked to each individual subject. There were 15 questions in the Single Option Stimulus Condition and 30 questions in the Multiple Option Stimulus Condition. All of the responses were tape recorded by the investigator.

In the pilot investigation the following results were found: (1) all of the nouns and verbs selected were appropriate for each
age level (3, 4, and 5 year olds) on the basis of their ability to describe the subjects, objects, and actions depicted in the picture; (2) the sequence in which the preschoolers appropriately responded to the wh-questions was (who, what, why, where, how, and when); (3) the response patterns varied according to the developmental level of the child; (4) the greatest confusion existed in the question that required the preschoolers to give an answer to "where", "how", and "when" questions; (5) the Single Option Stimulus received greater numbers of appropriate responses than the Multiple Option Stimulus; (6) the girls gave more appropriate responses on the "where", and "when" questions than the boys; (7) the amount of pictures presented (a total of 45) appeared to be "too" many for the preschoolers to attend to within the 20 minute testing period; and (8) the "focusing strategy" (see definition of terms section) was not effective for increasing the number of appropriate responses received in the Multiple Option Stimulus Condition. This conclusion was based on the low frequency counts obtained by the preschoolers when responding to the wh-questions.

Selection of Sample

Eighty Urban Black preschoolers were selected by the directors from four local Head Start centers in Columbus, Ohio to participate
in this study. There were a total of 40 boys and 40 girls divided into two treatment groups. Group A (the first 2 centers tested) consisting of 20 boys and 20 girls received the Single Option Stimulus first, followed by the Multiple Option Stimulus, while the subjects in Group B (the last 2 centers tested) received the reverse (Multiple Option Stimulus first, followed by the Single Option Stimulus). The subjects ranged in ages from 3.0-5.0 year old. The investigator received written consent from the Head Start agency and the parents (See Appendix A and B).

The following tables illustrate the age and sex distribution for Group A and Group B:
AGE AND SEX DISTRIBUTION FOR SINGLE OPTION
STIMULUS AND MULTIPLE OPTION STIMULUS

<table>
<thead>
<tr>
<th>Group</th>
<th>Single Option Stimulus</th>
<th></th>
<th>Multiple Option Stimulus</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Boys</td>
<td>Girls</td>
</tr>
<tr>
<td>3.0 - 3.5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>3.6 - 3.11</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>4.0 - 4.5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>4.6 - 4.11</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>20</td>
<td>Total</td>
<td>20</td>
</tr>
</tbody>
</table>

Data Collection/General Procedures

Each subject was tested individually in two different sessions on alternate weeks in a room assigned by the center's director. The only persons present in the testing room were the investigator and the preschooler being tested. The total testing period for the entire group (80 subjects) lasted for two months (October and November, 1983). The group consisted of preschoolers who attended both morning sessions (A.M.) and afternoon sessions (P.M.). Each
session was approximately 10 minutes. Group A received the Single Option Stimulus followed by the Multiple Option Stimulus. Group B received the Multiple Option Stimulus in the first session, followed by the Single Option Stimulus. (The Single and Multiple Option Stimulus are discussed in the next section entitled Instrumentation). All the subjects' responses were tape recorded.

Instrumentation

Pictures. There were 10 pictures in the Single Option Stimulus Condition (pictures designed such that only one type of wh-question could be answered from the information presented). Examples of two Single Option Stimulus Condition pictures are shown in Figures 1 and 2.

Each multiple option picture was shown twice with a different wh-question asked at each showing. Thus, a total of 10 pictures were used in the Multiple Option Stimulus Condition. An example of a Multiple Option Stimulus Condition picture is shown in Figure 3. All of the pictures used in this study are presented in Appendix C (Single Option Stimulus) and Appendix D (Multiple Option Stimulus).

The criteria for drawing the pictures was consistent with Gullo's (1979; 1981) guidelines, except for one major change. The pictures were changed to represent two cultural groups (Blacks
Figure 1. Example of a picture in the Single Option Stimulus Condition for a "who" question.
Figure 2. Example of a picture in the Single Option Stimulus Condition for a "what" question.
Figure 3. Example of a picture in the Multiple Option Stimulus Condition for a "who" and "what" question.
and Whites) as opposed to all White Americans. According to Banks (1983) there should be a strong attempt by educators to expose people (especially young children) to the notion of multi-ethnic portrayals when using pictorial media to foster a more multicultural perspective. Therefore, a strong effort was made by the investigator to include a more culturally diverse selection of stimulus in this study, because there were no pictorial illustrations that depicted Black Americans in previous comprehension studies (Gullo, 1979; 1982).

The other guidelines for designing the pictures in this study were:

1. The mode of presentation of pictorial stimuli were simple black and white drawings due to the perceptual development of the preschool child (Elkind, 1967).

2. The objects and actions represented were the central figure in the picture because preoperational children tend to focus their attention on the center of pictorial displays (Piaget, 1962).

3. Each scene in the picture was designed to depict information appropriate for answering the Single Option questions or the Multiple Option Stimulus questions.

4. Life-like situations were pictorially represented. To insure that the questions asked were realistic and reflected true-to-life situations, two verbs (jumping, running) and three nouns (boy, girl, dog) were depicted in the pictures (Ingram and Tyack, 1977; Gullo, 1982). This decision was based on the idea that if a small
number of nouns and verbs were used, the chances of the children giving appropriate responses would be better because the complexity of trying to process the sentence would not be a major factor in answering the questions.

Questions. There were 10 wh-questions used in each treatment condition (See Appendix E for Single Option Stimulus Condition Questions and Appendix F for Multiple Option Stimulus Condition Questions). There were 2 questions for each of the 5 wh-word types (who, what, why, where, when). An example is: "What is the dog jumping?" and "What is the girl jumping?".

In order to control for the syntactic complexity of the questions, (a noted problem in a previous comprehension study, Ervin-Tripp, 1970) the same question frame was used for all questions (Ingram and Tyack, 1977). All of the wh-questions asked in this study followed the same syntactic frame: wh-word + is + the + noun + verb + ing. Example: Who is the dog jumping? Why is the boy running?

Instructions. Each subject was given the same instructions as in the pilot study (See Appendix G).

Data Scoring Procedures

The data collected for Groups I, II, and III were scored using the following procedures:
Group I

Responses to wh-questions (who, what, why, where, when) scored categorically appropriate or inappropriate by using the following scoring procedures adapted from Tyack and Ingram (1977) in order to determine the sequence in which the preschoolers understood the wh-questions.

1. A categorically appropriate response to a "who" question included nouns such as the boy, girl, man, lady, mother, father, brother, or sister. "Who" questions required an animate human response, or inanimate object (dog). For example, "Who" is the boy helping?

2. A categorically appropriate response to a "what" question included nouns such as the box, wagon, fence, or rope. "What" questions required an inanimate or non-human noun response. For example, "What" is the boy eating?

3. A categorically appropriate response to a "why" question included answers such as "cause", "because", "to run from the dog", or "to help clean up the glass". "Why" questions required a causal response. For example, "Why" is the boy running?

4. A categorically appropriate response to a "where" question included answers such as "there", "here", "at the table", "in front of her house", or "on the ground". "Where" questions required a location response. For example, "Where" is the girl jumping?

5. A categorically appropriate response to a "when" question included answers such as "now", "today", "at lunch time", or "at night". "When" questions required a response indicating time. For example, "When" is the dog jumping?
Responses could be verbal or nonverbal (pointing) because preschoolers tend to use nonverbal gestures when they are unable to articulate their thoughts, ideas, and feelings (Robison, 1983). In addition, the responses needed only to reflect the criteria of the stimulus wh-word to be scored as appropriate, regardless of whether or not the response reflected the answer expected from the stimulus picture. During the testing sessions the questions were repeated upon request, since memory was not being tested (Gullo, 1979; 1982).

Group II

Another scoring was used to determine the response patterns to the following wh-words (where, when, why). The procedure that was used to determine response types has been adapted from the Cairns & Hsu (1978) study. The criteria for determining the four response types were as follows:

Response Type 1. Totally uncomprehending, or "I don't know."

Response Type 2. A response indicating some understanding, but a failure to form more than a minimal, fixed, or ritualistic response. For example, such responses as "there" to a "where" question, "now" to a "when" question, "fine" to a "how" question, "because" to a "why" question, are considered ritualistic, fixed, or minimal responses.
Response Type 3. A response indicating understanding, but the response is slightly semantically or syntactically inappropriate. For example, if a child responds to the question "Why is the boy running?" with a "because the dog" response, it would be categorized as a Response Type 3. The reason for such scoring is because the correct response would be that the dog is chasing the boy, which would indicate a cause-effect relationship.

Response Type 4. A completely appropriate, contextually accurate response. For example, "the boy is running from the dog" or "the cat is running from the dog."

Group III

When a response was confused with another wh-word it was scored in the appropriate wh-word category. For example, if a child gave a "where" response to a "when" question it was scored as a confused response in the "where" category.

Methods of Data Analysis/Procedures

The mode of analysis used to see if the data collected tended to lend support to the research hypothesis was as follows:

Group I: Quantitative Component

A three-between, two-within subjects Analysis of Variance (ANOVA) was administered. The between subjects variables were the ages, sex, and order of presentation of the stimulus options. The
within subjects variables were the repeated measures of stimulus option and wh-word type.

A Tukey post-hoc test (Kirk, 1968) was used to determine whether significant differences existed between the means for the variables of age and sex by wh-word to further confirm the results of the ANOVA.

**Group II: Qualitative Component**

A qualitative analysis of the two-way tables of summed frequencies of response types by wh-words (why, where, when) for each age level was administered.

**Group III: Qualitative Component**

A qualitative analysis (confusion matrix) of the two-way tables of summed frequencies for each age level was administered to determine confusion between wh-words (who, what, where, why, when) for all responses.

In conclusion, this chapter has presented 1) the objectives and results of the pilot study, 2) the general procedures utilized to select subjects and to collect data, 3) the data scoring procedures, and 4) the data analysis utilized for the investigation. In the next chapter, the results of the investigation are presented.
CHAPTER IV
ANALYSIS AND DISCUSSION OF DATA

Introduction

There are two major sections presented in this chapter:
1) Analysis of Quantitative Data; and 2) Analysis of Qualitative Data. The quantitative analysis is divided into reporting and discussing the statistical results as they relate to the data for the quantitative hypotheses listed in Group I (Chapter One). The qualitative analysis is divided into two major sections which reports and discusses the data relative to the qualitative hypotheses listed in Group II and III (Chapter One).

Analysis of Quantitative Data

In order to test the quantitative hypotheses (Group I), the data was subjected to a three-between, two-within subjects Analysis of Variance (ANOVA) to ascertain significant group differences.

Table 1 is a summary of the ANOVA results.
### Table 1

#### Analysis of Variance Summary

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between Subjects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>3</td>
<td>21.150</td>
<td>8.884*</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>0.845</td>
<td>0.354</td>
</tr>
<tr>
<td>Order of Presentation</td>
<td>1</td>
<td>1.445</td>
<td>0.607</td>
</tr>
<tr>
<td>Age x Sex</td>
<td>3</td>
<td>1.055</td>
<td>0.443</td>
</tr>
<tr>
<td>Age x Order</td>
<td>3</td>
<td>1.728</td>
<td>0.726</td>
</tr>
<tr>
<td>Sex x Order</td>
<td>1</td>
<td>1.620</td>
<td>0.680</td>
</tr>
<tr>
<td>Age x Sex x Order</td>
<td>3</td>
<td>1.216</td>
<td>0.511</td>
</tr>
<tr>
<td>Error</td>
<td>64</td>
<td>2.380</td>
<td></td>
</tr>
<tr>
<td><strong>Within Subjects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stimulus Option</td>
<td>1</td>
<td>3.645</td>
<td>10.983*</td>
</tr>
<tr>
<td>Age x Option</td>
<td>3</td>
<td>0.248</td>
<td>0.748</td>
</tr>
<tr>
<td>Sex x Option</td>
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<td>0.500</td>
<td>1.506</td>
</tr>
<tr>
<td>Order x Option</td>
<td>1</td>
<td>0.500</td>
<td>1.506</td>
</tr>
<tr>
<td>Age x Sex x Option</td>
<td>3</td>
<td>0.456</td>
<td>1.376</td>
</tr>
<tr>
<td>Age x Order x Option</td>
<td>3</td>
<td>0.395</td>
<td>1.195</td>
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<tr>
<td>Sex x Order x Option</td>
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<td>0.005</td>
<td>0.015</td>
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<tr>
<td>Age x Sex x Order x Option</td>
<td>3</td>
<td>0.068</td>
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</tr>
<tr>
<td>Error</td>
<td>64</td>
<td>0.331</td>
<td></td>
</tr>
<tr>
<td>Wh-word Type</td>
<td>4</td>
<td>41.070</td>
<td>76.834**</td>
</tr>
<tr>
<td>Age x Wh-word</td>
<td>12</td>
<td>1.661</td>
<td>3.108**</td>
</tr>
<tr>
<td>Sex x Wh-word</td>
<td>4</td>
<td>3.023</td>
<td>5.655**</td>
</tr>
<tr>
<td>Order x Wh-word</td>
<td>4</td>
<td>0.891</td>
<td>1.668</td>
</tr>
<tr>
<td>Age x Sex x Wh-word</td>
<td>12</td>
<td>0.153</td>
<td>0.288</td>
</tr>
<tr>
<td>Age x Order x Wh-word</td>
<td>12</td>
<td>0.604</td>
<td>1.130</td>
</tr>
<tr>
<td>Sex x Order x Wh-word</td>
<td>4</td>
<td>1.454</td>
<td>2.720</td>
</tr>
<tr>
<td>Age x Sex x Order x Wh-word</td>
<td>12</td>
<td>0.280</td>
<td>0.523</td>
</tr>
<tr>
<td>Error</td>
<td>256</td>
<td>0.534</td>
<td></td>
</tr>
<tr>
<td>Option x Wh-word</td>
<td>4</td>
<td>0.454</td>
<td>1.853</td>
</tr>
<tr>
<td>Age x Option x Wh-word</td>
<td>12</td>
<td>0.095</td>
<td>0.388</td>
</tr>
<tr>
<td>Sex x Option x Wh-word</td>
<td>4</td>
<td>0.096</td>
<td>0.395</td>
</tr>
<tr>
<td>Age x Sex x Option x Wh-word</td>
<td>12</td>
<td>0.191</td>
<td>0.779</td>
</tr>
<tr>
<td>Order x Option x Wh-word</td>
<td>4</td>
<td>0.190</td>
<td>0.777</td>
</tr>
<tr>
<td>Age x Order x Option x Wh-word</td>
<td>12</td>
<td>0.099</td>
<td>0.407</td>
</tr>
<tr>
<td>Sex x Order x Option x Wh-word</td>
<td>4</td>
<td>0.158</td>
<td>0.645</td>
</tr>
<tr>
<td>Age x Sex x Order x Option x Wh-word</td>
<td>12</td>
<td>0.133</td>
<td>0.546</td>
</tr>
<tr>
<td>Error</td>
<td>256</td>
<td>0.245</td>
<td></td>
</tr>
</tbody>
</table>

* ps .01

** ps .001
Inspection of this table indicates significant effects for:
Age \( (F = 8.884; \text{df} = 3, 64; p \leq .01) \); Stimulus Option \( (F = 10.983; \text{df} = 1, 64; p \leq .01) \); Wh-word Type \( (F = 76.884; \text{df} = 4, 256; p \leq .001) \); Age x Wh-word Type Interaction \( (F = 3.108; \text{df} = 12, 256; p \leq .001) \); and Sex x Wh-word Type Interaction \( (F = 5.664; \text{df} = 4, 256 p \leq .001) \). A discussion of each of the quantitative hypotheses with regard to the analysis results follows.

There is a difference in Urban Black preschool boys and girls between the ages of three and five years, rate of appropriate responses to oral wh-questions (who, what, why, where, and when) when pictorial stimuli are presented based on:

Hypothesis 1a: age group (Early 3's; Late 3's; Early 4's; Late 4's).

Hypothesis 1b: sex differences (male or female).

Hypothesis 1c: stimulus options (single or multiple).

Hypothesis 1d: order of presentation (single first or multiple first).

Hypothesis 1e: wh-word type (who, what, why, where, and when).

Hypothesis 1f: the interaction of age and wh-word type.

Hypothesis 1g: the interaction of sex and wh-word type.

Table 2 lists the descriptive data (Appropriate Score Means and Standard Deviations) for each stimulus condition by age levels.
### TABLE 2

STIMULUS OPTIONS APPROPRIATE

SCORE MEANS AND STANDARD DEVIATIONS BY AGE LEVELS

<table>
<thead>
<tr>
<th>Age Level</th>
<th>Single Option</th>
<th>Multiple Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early 3's</td>
<td>Mean 0.65</td>
<td>Mean 0.59</td>
</tr>
<tr>
<td></td>
<td>S.D. 0.93</td>
<td>S.D. 0.85</td>
</tr>
<tr>
<td>Late 3's</td>
<td>Mean 1.07</td>
<td>Mean 0.88</td>
</tr>
<tr>
<td></td>
<td>S.D. 0.91</td>
<td>S.D. 0.85</td>
</tr>
<tr>
<td>Early 4's</td>
<td>Mean 1.23</td>
<td>Mean 1.14</td>
</tr>
<tr>
<td></td>
<td>S.D. 0.67</td>
<td>S.D. 0.66</td>
</tr>
<tr>
<td>Late 4's</td>
<td>Mean 1.48</td>
<td>Mean 1.28</td>
</tr>
<tr>
<td></td>
<td>S.D. 0.58</td>
<td>S.D. 0.54</td>
</tr>
</tbody>
</table>

**Discussion**

The prediction in Hypothesis 1a is supported by the results of the ANOVA (see Table 1). As expected, the rate of appropriate responses in both the Single and Multiple Option Stimulus Condition increased with age. This developmental notion is consistent with other wh-question comprehension studies (Ervin-Tripp, 1970; Tyack and Ingram, 1977; Cairns and Hsu, 1978; Gullo, 1979; 1982).

Hypothesis 1b: There is a difference in Urban Black preschool boys and girls between the ages of three and five years, rate of appropriate responses to oral wh-questions (who, what, why, when) when pictorial stimuli are presented based on sex differences (male or female).
Table 3 presents the descriptive data (Appropriate Score Means and Standard Deviations) for each stimulus condition by sex.

**TABLE 3**

**STIMULUS OPTIONS APPROPRIATE**

**SCORE MEANS AND STANDARD DEVIATIONS BY SEX GROUPS**

<table>
<thead>
<tr>
<th>Sex Group</th>
<th>Single Option</th>
<th>Multiple Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male (N=40)</td>
<td>Mean 1.12</td>
<td>Mean 1.03</td>
</tr>
<tr>
<td></td>
<td>S.D. 0.75</td>
<td>S.D. 0.72</td>
</tr>
<tr>
<td>Female (N=40)</td>
<td>Mean 1.10</td>
<td>Mean 0.92</td>
</tr>
<tr>
<td></td>
<td>S.D. 0.83</td>
<td>S.D. 0.75</td>
</tr>
</tbody>
</table>

**Discussion**

The prediction in Hypothesis 1b was not supported by the analysis results (see Table 1). To the writer's knowledge there is no evidence that has been documented to support the notion of significant sex differences related to preschoolers' wh-question comprehension. However, the results tend to slightly favor the males in both treatment conditions. This difference should be examined in future studies with early elementary school students (kindergarten to third grade) to ascertain whether sex differences might exist among older children.

Hypothesis 1c: There is a difference in Urban Black preschool boys and girls between the ages of three and five years, rate of
appropriate responses to oral wh-questions (who, what, why, where, and when) when pictorial stimuli are presented based on the stimulus options (single or multiple).

Table 4 lists the descriptive data (Appropriate Score Means and Standard Deviations) by Stimulus Options.

<table>
<thead>
<tr>
<th></th>
<th>Single Option (N=80)</th>
<th>Multiple Option (N=80)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1.11</td>
<td>0.97</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.79</td>
<td>0.74</td>
</tr>
</tbody>
</table>

Discussion

The prediction in Hypothesis 1c was confirmed by the results of the analysis (see Table 1). This result suggests that the preschoolers' appropriate score means were significantly higher in the Single Option Stimulus Condition than in the Multiple Option Stimulus Condition. This finding is consistent with Gullo's (1979; 1982) results.

Possible explanations for this finding may be related to the bodies of research in the perceptual development area. With regard to the development of visual exploration, Piaget (1962) suggested
that children at the preoperational level (2-7 years old) are more likely than children at the concrete operational level (7-11 years old) to fix attention or "center" on the most compelling aspect of a stimulus display to the exclusion of other less striking aspects of the visual field (p. 178). This notion described by Piaget is referred to as the "centration" hypothesis. It has been supported in other perceptual development studies (Elkind and Scott, 1962; Elkind and Weiss, 1967; Gullo, 1979; 1982). It is important to note that the pictures in the Single and Multiple Option Stimulus Condition were designed such that the objects and subjects were in the center of the display. However, in the Multiple Stimulus Condition more information was presented in the pictorial display than in the Single Stimulus Condition. Therefore, the difference in the preschoolers' ability to respond correctly to more of the wh-questions in the Single Condition as compared to the multiple condition may be attributed to the number of subjects and objects presented in the pictorial display.

Another possible explanation for this finding may be related to the mode of pictorial presentation research. Studies have documented that children's recognition rate for detail (Hinz, 1969) and children's speed of recognition (Ryan and Schwartz, 1956) are facilitated when pictures are presented in a more simplified fashion.
Hypothesis 1d: There is a difference in Urban Black preschool boys and girls between the ages of three and five years, rate of appropriate responses to oral wh-questions (who, what, why, where, and when) when pictorial stimuli are presented based on the order of presentation (single first or multiple first).

Table 5 presents the descriptive data (Appropriate Score Means and Standard Deviations) by the order of presentation for the two stimulus options.

**TABLE 5**

**APPROPRIATE SCORE MEANS AND STANDARD DEVIATIONS BY ORDER OF PRESENTATION**

<table>
<thead>
<tr>
<th>Stimulus</th>
<th>Order</th>
<th>First (N=40)</th>
<th>Second (N=40)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td>1.09</td>
<td>0.82</td>
</tr>
<tr>
<td>Multiple</td>
<td>Mean</td>
<td>0.91</td>
<td>0.77</td>
</tr>
</tbody>
</table>

**Discussion**

This prediction was not supported by the results of the analysis (see Table 1). A possible explanation as to why this prediction was not supported may be related to the previous discussed "centration" hypothesis proposed by Piaget (1962). According to Piaget's
hypothesis, it is not the order in which the pictures are presented, but rather the arrangement of the subjects and objects in the pictorial displays that will influence the answers given by the preschoolers in this study.

Hypothesis 1 e: There is a difference in Urban Black preschool boys and girls between the ages of three and five years, rate of appropriate responses to oral wh-questions (who, what, why, where, and when) when pictorial stimuli are presented based on the wh-word type (who, what, why, where, and when).

Table 6 lists the descriptive data (Appropriate Score Means and Standard Deviations) by wh-word type for each stimulus condition.

**TABLE 6**

**APPROPRIATE SCORE MEANS AND STANDARD DEVIATIONS BY WH-WORD TYPE**

<table>
<thead>
<tr>
<th>Stimulus Option</th>
<th>Who</th>
<th>What</th>
<th>Why</th>
<th>Where</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single (N=80)</td>
<td>Mean 1.48</td>
<td>1.48</td>
<td>1.36</td>
<td>0.84</td>
<td>0.39</td>
</tr>
<tr>
<td></td>
<td>S.D. 0.74</td>
<td>0.79</td>
<td>0.85</td>
<td>0.82</td>
<td>0.75</td>
</tr>
<tr>
<td>Multiple (N=80)</td>
<td>Mean 1.28</td>
<td>1.39</td>
<td>1.29</td>
<td>0.81</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>S.D. 0.82</td>
<td>0.79</td>
<td>0.81</td>
<td>0.42</td>
<td></td>
</tr>
</tbody>
</table>
Discussion

The analysis provided support for this prediction (see Table 1). Earlier wh-question comprehension studies have documented that the earlier acquired wh-word types (who and what) are those which require concrete referents or are easily observed, while the later acquired wh-words (where and when) require the ability to relate to more abstract constructs, such as space and time, respectively. It may be recalled that all of the object/subject in the pictures which required a "who", "what", and "why" response were the central features (striking aspects) in each pictorial display. Therefore, the preschoolers' ability to respond appropriately to the "who", "what", and "why" questions may be related to the "centration" hypothesis earlier discussed. Other possibilities may be that the preschoolers learn very early in their development to "label" and give names to objects and subjects in their immediate environment, and that the objects and subjects in the pictures were easy to identify.

In addition, Piaget (1967) indicates that the constructs of space and time are not fully developed until the elementary school period. Based on Piaget's notion, it may be suspected that as the preschoolers in this study become older, their ability to provide more appropriate responses to "where" and "when" questions improves.
Another possible explanation for the preschoolers' inability to respond appropriately to the "where" and "when" questions may be that they perceive pictorial displays as being "static" (Smart and Smart, 1973). In general, the preschoolers perceive the pictures which they are viewing as existing at that particular moment. If this position is true, it may be possible that the preschoolers in this study were unable to demonstrate the ability to "transport" their internalized thought-processes in a manner which was necessary to respond appropriately to the "where" and "when" questions. This finding is consistent with other wh-question comprehension studies (Ervin-Tripp, 1970; Tyack and Ingram, 1977; Cairns and Hsu, 1978; Gullo, 1979; 1982).

Hypothesis 1f: There is a difference in Urban Black preschool boys and girls between the ages of three and five years, rate of appropriate responses to oral wh-questions (who, what, why, where, and when) when pictorial stimuli are presented based on the interaction of age and wh-word type.

Table 7 reports the descriptive data (Appropriate Score Means and Standard Deviations) for the age x wh-word interaction.
TABLE 7
APPROPRIATE SCORE MEANS
AND STANDARD DEVIATIONS FOR AGE X WH-WORD INTERACTION

<table>
<thead>
<tr>
<th>Age</th>
<th>Who Mean (N=20)</th>
<th>Who S.D.</th>
<th>What Mean</th>
<th>What S.D.</th>
<th>Why Mean</th>
<th>Why S.D.</th>
<th>Where Mean</th>
<th>Where S.D.</th>
<th>When Mean</th>
<th>When S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early 3's</td>
<td>0.80</td>
<td>0.94</td>
<td>0.88</td>
<td>1.04</td>
<td>0.85</td>
<td>1.03</td>
<td>0.43</td>
<td>0.85</td>
<td>0.15</td>
<td>0.50</td>
</tr>
<tr>
<td>Late 3's</td>
<td>1.35</td>
<td>0.88</td>
<td>1.18</td>
<td>0.94</td>
<td>1.20</td>
<td>0.96</td>
<td>0.80</td>
<td>0.86</td>
<td>0.35</td>
<td>0.74</td>
</tr>
<tr>
<td>Early 4's</td>
<td>1.58</td>
<td>0.75</td>
<td>1.75</td>
<td>0.58</td>
<td>1.63</td>
<td>0.62</td>
<td>0.78</td>
<td>0.79</td>
<td>0.20</td>
<td>0.57</td>
</tr>
<tr>
<td>Late 4's</td>
<td>1.78</td>
<td>0.49</td>
<td>1.93</td>
<td>0.28</td>
<td>1.63</td>
<td>0.57</td>
<td>1.30</td>
<td>0.75</td>
<td>0.28</td>
<td>0.60</td>
</tr>
</tbody>
</table>

The results of the ANOVA (see Table 1) confirmed the prediction. However, the ANOVA results are further analyzed and discussed with regard to a series of Tukey post hoc test (Kirk, 1968) that follow. The criteria for the level of significance was set at .05. The Tukey tests were administered to obtain the significant difference between means for the rate of appropriate responses.

**Tukey Post Hoc General Results**

Table 8 reveals the results of the Tukey test for group differences with respect to the "who" question.
**TABLE 8**

TUKEY TEST RESULTS

OF SIGNIFICANT MEAN DIFFERENCES FOR THE "WHO" QUESTION

<table>
<thead>
<tr>
<th></th>
<th>Early 3's</th>
<th>Late 3's</th>
<th>Early 4's</th>
<th>Late 4's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early 3's</td>
<td></td>
<td>0.55</td>
<td>0.78*</td>
<td>0.98*</td>
</tr>
<tr>
<td>Late 3's</td>
<td></td>
<td></td>
<td>0.23</td>
<td>0.43</td>
</tr>
<tr>
<td>Early 4's</td>
<td></td>
<td></td>
<td></td>
<td>0.20</td>
</tr>
<tr>
<td>Late 4's</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p ≤ .05  
q = 0.60

Inspection of this table indicates that there were significant differences among the appropriate score means of the early and late four year olds (X = 1.58; \( \bar{X} = 1.78 \)) as compared to the early three year olds (X = 0.80).

Table 9 presents the results of the Tukey test relative to the "What" question.
TABLE 9
TUKEY TEST RESULTS

<table>
<thead>
<tr>
<th></th>
<th>Early 3's</th>
<th>Late 3's</th>
<th>Early 4's</th>
<th>Late 4's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early 3's</td>
<td></td>
<td>0.30</td>
<td>0.87*</td>
<td>1.06*</td>
</tr>
<tr>
<td>Late 3's</td>
<td></td>
<td></td>
<td>0.57</td>
<td>0.75*</td>
</tr>
<tr>
<td>Early 4's</td>
<td></td>
<td></td>
<td></td>
<td>0.18</td>
</tr>
<tr>
<td>Late 4's</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p ≤ .05
q = 0.60

Inspection of this table indicates a significant group difference among the appropriate score means of the latter two groups, early and late four year olds ($\bar{X} = 1.75; \bar{X} = 1.93$), as compared to the early three year olds ($\bar{X} = 0.88$); as well as the late four year olds ($\bar{X} = 1.93$) and the late three year olds ($\bar{X} = 1.18$).

Table 10 lists the results of the Tukey test with respect to the "Why" question.
**TABLE 10**
TUKEY TEST RESULTS

<table>
<thead>
<tr>
<th></th>
<th>Early 3's</th>
<th>Late 3's</th>
<th>Early 4's</th>
<th>Late 4's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early 3's</td>
<td></td>
<td>0.35</td>
<td>0.78*</td>
<td>0.78*</td>
</tr>
<tr>
<td>Late 3's</td>
<td></td>
<td></td>
<td>0.43</td>
<td>0.43</td>
</tr>
<tr>
<td>Early 4's</td>
<td></td>
<td></td>
<td></td>
<td>0.00</td>
</tr>
<tr>
<td>Late 4's</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p ≤ .05
q = 0.60

The results of this table reveal a significant group difference among the appropriate score means of the latter two groups, early and late four year olds (\(X = 1.63; \bar{X} = 1.63\)), as compared to the early three year olds (\(X = 0.85\)).

Table 11 presents the results of the Tukey test with respect to the "Where" question.
**TABLE 11**

**TUKEY TEST RESULTS**

<table>
<thead>
<tr>
<th>Where</th>
<th>Early 3's</th>
<th>Late 3's</th>
<th>Early 4's</th>
<th>Late 4's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early 3's</td>
<td></td>
<td>0.37</td>
<td>0.35</td>
<td>0.07*</td>
</tr>
<tr>
<td>Late 3's</td>
<td></td>
<td></td>
<td>0.02</td>
<td>0.50</td>
</tr>
<tr>
<td>Early 4's</td>
<td></td>
<td></td>
<td></td>
<td>0.52</td>
</tr>
<tr>
<td>Late 4's</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p ≤ .05  \( q = 0.60 \)

Inspection of this table indicates only one significant group difference among the appropriate score means of the late four year olds (\( \bar{X} = 1.30 \)) as compared to the early three year olds (\( \bar{X} = 0.43 \)).

Table 12 lists the results of the Tukey test with respect to the "When" question.
TABLE 12
TUKEY TEST RESULTS

When

<table>
<thead>
<tr>
<th>When</th>
<th>Early 3's</th>
<th>Late 3's</th>
<th>Early 4's</th>
<th>Late 4's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early 3's</td>
<td>___</td>
<td>0.20</td>
<td>0.05</td>
<td>0.13</td>
</tr>
<tr>
<td>Late 3's</td>
<td>0.15</td>
<td>___</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>Early 4's</td>
<td></td>
<td></td>
<td>___</td>
<td>0.08</td>
</tr>
<tr>
<td>Late 4's</td>
<td></td>
<td></td>
<td></td>
<td>___</td>
</tr>
</tbody>
</table>

*p \leq .05 \quad q = 0.60

Inspection of this table indicates no significant group differences among the appropriate score means for the four age groups: early three (\( \bar{X} = 0.15 \)); late three (\( \bar{X} = 0.35 \)); early four (\( \bar{X} = 0.20 \)); and late four year olds (\( \bar{X} = 0.28 \)).

Summary of Tukey Test Results

The results of the Tukey tests suggest that the early three year old's appropriate score means were significantly lower than the latter two age groups when responding to the who, what, and why questions. Possible explanations for this result may be that the younger preschoolers in this study had problems in recognizing the objects in the pictures and that they were also not yet at the
developmental level necessary for comprehending who, what, and why questions (Gullo, 1979).

In addition, the results of the Tukey test indicates that the "where" and "when" questions appeared to be too difficult for all four age groups in this study to comprehend based upon their low appropriate score means. A possible explanation for this result may be related to Piaget's (1971) notion of the abstract constructs of space and time being too difficult for preschoolers to grasp. An interesting finding is that there is some evidence of improvement in the late four year olds' appropriate score means for the "where" question. This result suggests that the four year olds in this study were better able to comprehend the "where" question than the other three groups.

Hypothesis 1g: There is a difference in Urban Black preschool boys and girls between the ages of three and five years, rate of appropriate responses to oral wh-questions (who, what, why, where, and when) when pictorial stimuli are presented based on the interaction of sex and wh-word type.

Table 13 lists the descriptive data (Appropriate Score Means and Standard Deviations) for the sex x wh-word type interaction.
TABLE 13

APPROPRIATE SCORE MEANS AND STANDARD DEVIATIONS FOR SEX X WH-WORD TYPE INTERACTION

<table>
<thead>
<tr>
<th></th>
<th>Who</th>
<th>What</th>
<th>Why</th>
<th>Where</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1.54</td>
<td>1.49</td>
<td>1.49</td>
<td>0.74</td>
<td>0.11</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.75</td>
<td>0.81</td>
<td>0.81</td>
<td>0.82</td>
<td>0.40</td>
</tr>
<tr>
<td>Female</td>
<td>1.21</td>
<td>1.38</td>
<td>1.16</td>
<td>0.91</td>
<td>0.38</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.81</td>
<td>0.74</td>
<td>0.83</td>
<td>0.81</td>
<td>0.76</td>
</tr>
</tbody>
</table>

The results of the ANOVA (see Table 1) supports the prediction. This data is further analyzed and discussed by means of a series of Tukey post hoc tests (Kirk, 1968). The criteria for the level of significance was set at .05.

Table 14 reports the results of the Tukey test for group differences among the appropriate score means of the male subjects for the five wh-word types.
TABLE 14
TUKEY TEST RESULTS

<table>
<thead>
<tr>
<th>Wh-Word Type</th>
<th>Male Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Who</td>
</tr>
<tr>
<td>Who</td>
<td>___</td>
</tr>
<tr>
<td>What</td>
<td>___</td>
</tr>
<tr>
<td>Why</td>
<td>___</td>
</tr>
<tr>
<td>Where</td>
<td>___</td>
</tr>
<tr>
<td>When</td>
<td>___</td>
</tr>
</tbody>
</table>

*p ≤ .05
q = 0.37

Inspection of this table indicates significant group differences among the appropriate score means for the male subjects' responses to who, what, and why questions (\(\bar{X} = 1.54; \bar{X} = 1.49; \bar{X} = 1.49\)) as compared to "where" questions (\(\bar{X} = 0.74\)). In addition, there are also significant group differences among the appropriate score means for the male subjects' responses to what, why, and where questions (\(\bar{X} = 1.49; \bar{X} = 1.49; \bar{X} = 0.74\)) as compared to "when" questions (\(\bar{X} = 0.11\)). There was also a significant difference found between "where" (\(\bar{X} = 0.74\)) and "when" (\(\bar{X} = 0.11\)).
Table 15 presents the results of the Tukey test for group differences among the appropriate score means of the female subjects for the five wh-word types.

TABLE 15
TUKEY TEST RESULTS

<table>
<thead>
<tr>
<th>Wh-Word Type</th>
<th>Female Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Who</td>
</tr>
<tr>
<td>Who</td>
<td></td>
</tr>
<tr>
<td>What</td>
<td></td>
</tr>
<tr>
<td>Why</td>
<td></td>
</tr>
<tr>
<td>Where</td>
<td></td>
</tr>
<tr>
<td>When</td>
<td></td>
</tr>
</tbody>
</table>

*p ≤ .05

Inspection of this table indicates significant group differences among the appropriate score means for the who, what, and why and where questions (X = 1.21; X = 1.38; X = 1.16; X = 0.91) as compared to when (X = 0.38). Also, a significant appropriate score mean was found between the what (X = 1.38) and the where (X = 0.91).
Summary of Tukey Test Results

The Tukey test results confirmed the ANOVA. The results of the Tukey test suggest that the who, what, and why questions were better understood by the boys and girls in this study than the where and when questions. These results also indicate that the boys tended to demonstrate a slightly better understanding of the earlier acquired wh-word types (who, what, and why), while the girls demonstrated slightly higher appropriate mean scores for the "where" and "when" questions. To the investigator's knowledge the significant sex x wh-word type interaction revealed in this study is unique with respect to previous studies of preschoolers' comprehension of wh-questions.

In the next section, the results of the qualitative analysis with respect to the qualitative hypotheses in Group II and III, Chapter One, are presented.

Analysis of Qualitative Data

In order to assess the response type categories of the wh-questions (why, where, and when), the scoring procedure from Cairns and Hsu's (1978) study was administered. The criteria for determining the four response type categories was:

Response Type 1. Totally uncomprehending, or "I don't know."
Response Type 2. A response indicating some understanding but a failure to form more than a minimal, fixed, or ritualistic
response. For example, such responses as "there" to a "where" question, "now" to a "where" question, "fine" to a "how" question, "because" to a "why" question, are considered ritualistic, fixed, or minimal responses.

Response Type 3. A response indicating understanding, but the response is slightly semantically or syntactically inappropriate. For example, if a child responds to the question "Why is the boy running?" with a "because the dog" response, it would be categorized as a Response Type 3. The reason for such scoring is because the correct response would be that the dog is chasing the boy, which indicates a cause-effect relationship.

Response Type 4. A completely appropriate, contextually accurate response. For example, "the boy is running from the dog" or "the cat is running from the dog".

Table 16 lists response types for the eighty subjects in this study with respect to the oral why, where, and when questions for each age level.
### TABLE 16
RESPONSE TYPES
BY AGE LEVEL (FREQUENCIES)

<table>
<thead>
<tr>
<th></th>
<th>Why</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Early 3 (N=20)</td>
<td>46</td>
<td>15</td>
<td>5</td>
<td>14</td>
<td>63</td>
<td>6</td>
<td>4</td>
<td>7</td>
<td>74</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Late 3 (N=20)</td>
<td>32</td>
<td>12</td>
<td>3</td>
<td>33</td>
<td>48</td>
<td>6</td>
<td>2</td>
<td>24</td>
<td>66</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Early 4 (N=20)</td>
<td>16</td>
<td>31</td>
<td>6</td>
<td>27</td>
<td>49</td>
<td>3</td>
<td>5</td>
<td>23</td>
<td>72</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Late 4 (N=20)</td>
<td>15</td>
<td>16</td>
<td>3</td>
<td>46</td>
<td>28</td>
<td>5</td>
<td>2</td>
<td>45</td>
<td>69</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>109</td>
<td>74</td>
<td>17</td>
<td>120</td>
<td>188</td>
<td>16</td>
<td>13</td>
<td>99</td>
<td>281</td>
<td>5</td>
<td>30</td>
</tr>
</tbody>
</table>

*Four responses per subject per wh-word type.*

Hypothesis II: There is a difference in the two-way frequency patterns for the four types of responses to oral why, where, and when questions when pictorial stimuli are presented to Urban Black preschool boys and girls between the ages of three and five years old.

**Discussion**

Inspection of this table indicates that the "when" questions received the greatest number of response type 1 (283). This result suggests that the "when" question was infrequently understood by the
preschoolers in this study. This finding is consistent with other
wh-question comprehension studies (Ervin-Tripp, 1970; Tyack and
Ingram, 1977; Cairns and Hsu, 1978; Gullo, 1979; 1982). The "why"
question received the least amount of response type 1 (109)
followed by the "where" question (188). These findings suggest
that the preschoolers in this study demonstrated a better understand-
ing of the "why" question as compared to the "where" and "when"
questions.

With respect to the response type 2 category, the results
reveal that the "why" question (74) received more "ritualistic"
responses such as "cause", "because" than the "where" question (16)
"there", "up", "here" and the "when" question (13) "now".

An unexpected finding with regard to the response type 3
category was revealed. A response indicating understanding, but
is slightly semantically or syntactically inappropriate would be
scored as a response type 3. The "when" question (30) received more
response type 3's than the "why" (17) and the "where" (13) question.
A possible explanation for this finding may be related to the scoring
procedure used in this study. For example, if a child responded to
the "when" question by identifying the "sun" or the "moon" in the
picture, he would receive a response type 3 score. Examples of
such responses were as follows: Question: "When is the boy jumping?
Response: "When the moon comes out." Question: "When is the dog jumping?" Response: "When the sun comes out."

With respect to the response type 4 category, the highest number of frequencies was found for the "why" question (120) followed by the "where" (99) and the "when" question (4).

To summarize, the results of the relative response type patterns suggest that the "why" question was better understood by the preschoolers in this study. The constructs of space and time as evidenced by the results of Table 16, provides support for the notion that such concepts are too difficult for the cognitive abilities of the preschool child, specifically the eighty subjects in this study.

In the final section, the results of which wh-word types were most confused with other wh-words are presented.

Hypothesis III: There is a pattern of inappropriate responses to wh-questions (who, what, why, where, and when) that can be determined when pictorial stimuli are presented to Urban Black preschool boys and girls between the ages of three and five years old.

Tables 17 through 20 list the summed two-way frequencies of inappropriate responses to the wh-questions (who, what, why, where, and when) for each age level.
### Table 17
Inappropriate Response Categories (Early 3)

<table>
<thead>
<tr>
<th>Wh-Question Asked</th>
<th>Who</th>
<th>What</th>
<th>Why</th>
<th>Where</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who</td>
<td>0</td>
<td>39</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>What</td>
<td>0</td>
<td>*26</td>
<td>4</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Why</td>
<td>0</td>
<td>35</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Where</td>
<td>0</td>
<td>41</td>
<td>13</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>When</td>
<td>0</td>
<td>33</td>
<td>21</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>174</td>
<td>41</td>
<td>32</td>
<td>0</td>
</tr>
</tbody>
</table>

### Table 18
Inappropriate Response Categories (Late 3)

<table>
<thead>
<tr>
<th>Wh-Question Asked</th>
<th>Who</th>
<th>What</th>
<th>Why</th>
<th>Where</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who</td>
<td>0</td>
<td>9</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>What</td>
<td>0</td>
<td>*19</td>
<td>5</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Why</td>
<td>0</td>
<td>15</td>
<td>0</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Where</td>
<td>0</td>
<td>25</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>When</td>
<td>0</td>
<td>14</td>
<td>23</td>
<td>24</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>82</td>
<td>46</td>
<td>40</td>
<td>1</td>
</tr>
</tbody>
</table>
### TABLE 19
**INAPPROPRIATE RESPONSE CATEGORIES (EARLY 4)**

<table>
<thead>
<tr>
<th>Wh-Question Asked</th>
<th>Who</th>
<th>What</th>
<th>Why</th>
<th>Where</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who</td>
<td>0</td>
<td>11</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>What</td>
<td>0</td>
<td>*3</td>
<td>8</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Why</td>
<td>0</td>
<td>11</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Where</td>
<td>1</td>
<td>28</td>
<td>19</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>When</td>
<td>1</td>
<td>13</td>
<td>26</td>
<td>32</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2</td>
<td>66</td>
<td>58</td>
<td>40</td>
<td>0</td>
</tr>
</tbody>
</table>

### TABLE 20
**INAPPROPRIATE RESPONSE CATEGORIES (LATE 4)**

<table>
<thead>
<tr>
<th>Wh-Question Asked</th>
<th>Who</th>
<th>What</th>
<th>Why</th>
<th>Where</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who</td>
<td>0</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>What</td>
<td>0</td>
<td>*0</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Why</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Where</td>
<td>1</td>
<td>18</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>When</td>
<td>0</td>
<td>10</td>
<td>19</td>
<td>33</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1</td>
<td>43</td>
<td>25</td>
<td>44</td>
<td>0</td>
</tr>
</tbody>
</table>
Discussion

Inspection of table 17 through 20 indicate that the most frequent inappropriate answer given was a "what" response confusion. This finding is consistent with Tyack and Ingram (1977) and Gullo's (1982) findings. For example, if the question "Who is the dog jumping?" was asked, a frequent response was given such as "the wagon" or "the box". According to Tyack and Ingram (1977) this confusion is attributed to an error in "animacy", which is a confusion between persons and objects.

The confusion most frequently made by the younger children (early three year olds) who tended to "describe" the action of the object or subject in the picture may be attributed to Piaget's (1962) "echolalia speech" concept. In this stage of speech the child repeats for his own pleasure, his own utterances, and those of others. For example, for the question "Who is the dog jumping?" a typical response by an early three year old was "dog jumping".

There were two other types of confusion patterns found. The "why" and "where" responses were given for the "when" question. For example, the question: "When is the dog jumping?" received responses such as "Cause his Mommy told him," "Because he wants to", or "Dog jumping over the boy". This finding may be attributed to the children's inability to fully understand the time or temporal construct (Piaget, 1971).
In conclusion, the results of this study indicate that the ability to appropriately respond to wh-questions vary depending on the age level of the child and the amount of information present in a picture. It was also found that when errors were made they tended to follow a pattern for answering such questions. In the next chapter a discussion of what these findings suggest for educational practices and future research are presented.
CHAPTER V
SUMMARY
IMPLICATIONS AND FUTURE RESEARCH DIRECTIONS

Introduction

There are three major sections in this chapter: 1) Summary of the Findings; 2) Implications for Educational Practices; and 3) Recommendations for Future Research Directions. In the initial section the results of this study are discussed. In the second section, a discussion of how these results relate to the educational practices of early childhood educators are provided. In the final section, possible suggestions for related research are presented.

Summary of Findings

This study was designed to 1) examine the rate of appropriate responses to five oral wh-questions (who, what, why, where, and when) for eighty Urban Black preschool boys and girls between the ages of 3 and 5 years old, 2) determine whether there were certain response strategies used to answer certain wh-questions (why, where, and when), and 3) investigate which wh-words were most often confused with other wh-words when responding to wh-questions (who, what, why, where, and when).
In order to assess their performance there were two sets of pictorially presented situations utilized. These pictures were adopted from Gullo's (1979; 1982) wh-question comprehension studies. The first set consisted of pictures designed such that only the information to answer the wh-questions being asked was presented (Single Option Stimulus Condition). In contrast, the second set was designed such that more than one type of wh-question could be answered from the information presented (Multiple Option Stimulus Condition). All of the pictures used in this study are illustrated in the Appendix section.

As predicted, the results revealed significant differences based on age levels of the children in this study. This result was further supported by a significant difference found in the age x wh-word type interaction. It was found that certain wh-word constructs were acquired earlier than others. In this study, the early acquired wh-words were ("who", "what", and "why"), while the later acquired wh-words were ("where" and "when"). This order of acquisition was attributed to the inability of the preschoolers to fully comprehend the abstract constructs of space and time (Piaget, 1971).

With respect to the preschoolers' ability to respond better in the Single Option Stimulus Condition as compared to the Multiple Option Stimulus Condition, a significant difference was revealed.
This result indicates that the preschoolers in this study were better able to understand the wh-questions when the information was presented in a simplified fashion (Hinz, 1967; Gullo, 1979; 1982).

It was also found that the "why" questions received the most "ritualistic" type of responses. For example, when the preschoolers were asked the question "Why is the boy jumping?", responses such as "Cause", or "Because" were given. In contrast, the "where" and "when" questions did not receive as many ritualistic-type responses. A possible explanation for this may be the abstract construct of the cause-effect relationship emerges before the space and time concepts. According to Piaget (1971) the understanding of the constructs of space and time does not begin to develop in children until around age six.

Another result revealed that the preschoolers tended to give "what" responses to "who", "why", "where", and "when" questions. This finding was also consistent with other wh-question comprehension studies (Ingram and Tyack, 1977; Gullo, 1982). A possible explanation for this result was attributed to the confusion between subjects and objects, "animacy" as described by Ingram and Tyack, 1977, and the "centration" hypothesis as described by Piaget, 1971. In addition, it was also suspected that when the preschoolers were unable to answer the wh-question they demonstrated a tendency to
"name" or "label" the objects or subjects in the center of the pictorial display or described the action depicted in the picture (Smart and Smart, 1973).

In addition, another interesting finding was revealed in this study relative to the "what" responses. It was evidenced in this study that the preschoolers tended to respond to the question "What is the dog jumping?" with a response such as "dog jumping." It is important to note, that this type of response was given on a frequent basis by the youngest group in this study (early three year olds). This finding suggest that the early three year olds are not quite at the developmental level necessary to completely understand the "who" construct (Ingram and Tyack, 1977), therefore, they tended to repeat what was heard as described by Piaget's (1962) concept of "echolalia speech."

**Implications for Educational Practices**

The data may provide a source of knowledge to the early childhood field for pre-service and in-service teachers, parents, curriculum planners, and significant caregivers of young children.

The results of the study suggest that pre-service teachers, specifically those in the early childhood education field become aware of the importance of questioning in the teaching-learning context. They can be provided the opportunity to participate in field experiences which will enable them to practice asking
questions, specifically wh-questions, to ascertain what type of
questions are understood by preschoolers.

In addition to field experiences, undergraduate education stu-
dents and preschool teachers and parents can be given instructional
training that could be utilized to help them strengthen their
question-asking skills such as observing the following: 1) the
ability to comprehend wh-questions depends on the age of the child,
2) some wh-question constructs are understood earlier (who, what,
why) than other wh-question constructs (where and when), 3) the
amount of information presented in a picture has an impact on the
child's ability to understand wh-questions, 4) when preschool chil-
dren do not know the answer they tend to give a "what" response to
wh-questions such as why, where, and when, and 5) preschoolers tend
to give ritualistic responses to why, where, and when questions.

Such instructional experiences may include tape-recordings of
teaching-learning situations or informal discussions with classmates
or friends. As a result of utilizing the tape recording technique,
teachers may become aware of other areas that could contribute to
their ability to enhance children's learning experiences. For
example, teachers may find out that they are asking too many ques-
tions without a sufficient amount of "wait-time" to allow for chil-
dren's responses.
With respect to in-service teachers, this study may provide insight into what types of wh-questions are better understood by preschoolers. The results of this study indicate a possible need for teachers to become more aware of the types of pictorial stimuli they use when attempting to teach new concepts. It suggests that preschool teachers utilize very simple pictures when teaching a new concept. Once the concept has been learned more complex pictures may be used. This procedure may be particularly useful when working with very young children such as early 3 year olds because of their developmental abilities (Smart and Smart, 1973).

Teachers may also become more aware of the types of responses children give to specific wh-questions (why, where, when). As indicated in this study, the preschoolers tended to give "ritualistic" responses which followed patterns when responding to these wh-questions. As a result of the teacher actively listening to the type of responses the children give, along with in-service training sessions with respect to developing better question-asking skills, teachers may become skillful and competent question askers.

The results of this study suggest that parents may also be given insights into the types of wh-questions their children can comprehend in order that they may expand upon developing concepts in the home. It may be useful for parents to also become a part of seminars/workshops that may help them become skillful question
askers. The role of the parent can be beneficial in helping develop children's skills in answering wh-questions. For example, by giving the children the opportunity to become exposed to various environmental stimuli, specifically pictures, enables them an opportunity not only to ask questions, but also to answer them.

It is the investigator's contention that a very important aspect of any educational program is the curriculum. Therefore, the results of this study could be useful to the curriculum planner of early childhood programs. To the researcher's knowledge, very little attention has been given to developing the preschool teacher's ability to ask "good" questions. It is the investigator's belief that a "good" question is one that takes into account the developmental level of an individual as well as the level of thinking it stimulates (Cunningham, 1980). Given this position, the results of this study may serve as a basis for in-service training. As a result, insights into the types of responses that preschoolers give may be identified.

Finally, with respect to the caregivers of young children, specifically in the home context, this study could provide a meaningful source of insight based primarily on the assumption that a great deal of verbal interactions exist between the child and the caregiver. It could benefit the caregiver to know that certain
types of wh-questions are not as easily understood as others. This study may serve as a basis for providing such an understanding.

In conclusion, the results of this study suggest that many teaching-learning contexts are impacted by the type of interactions we have with young children.

Future Research Directions

As a result of this study, the following recommendations are presented as possibilities for future research.

It is recommended that further research on children's comprehension of wh-questions be conducted by using an older sample to determine at what age the where and when questions are acquired.

Different types of visual stimuli are recommended in further research studies such as picture books, flannel boards, video-tapes, photographs, and the like to be utilized to determine which form of stimulation is most conducive to comprehending wh-questions.

It is recommended to change the syntactic framing of the questions to see if this would make a difference in the children's ability to comprehend the questions.

Another recommendation would be to ask the children to tell you about the picture first; based on their response(s) the researcher could then ask a wh-question.

Another research possibility could be to look at social class differences or include another cultural group as a part of the study.
In addition, investigations related to brain-functioning research could be done to investigate which part of the brain is activated first when presented with oral questions about visual stimuli.

A final recommendation is to record question-asking behaviors in a naturalistic setting to determine what types of questions are asked, what types of responses are given, and what feedback strategies are used.

Effective questioning is not an innate talent that only a few possess; it is a skill that can be developed with practice. It is one of the teacher's basic tools of communication. Teachers who are not adept at questioning, who do not develop a questioning attitude, and who do not pose questions as they prepare for teaching will have difficulty directing the learning of children (Cunningham, 1972, p. 84).

It is the investigator's contention that this study may serve as a starting point for many training sessions to enhance the questioning skills of early childhood participants.
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APPENDIX A

CONSENT LETTER FROM HEAD START AGENCY

and

HUMAN SUBJECTS REVIEW COMMITTEE APPROVAL FORM
Dear Mr. Bell:

As discussed with you we, at Head Start, have a deep interest in the importance of your study to investigate whether there are developmental differences in urban-Black low-socio-economic preschool children's responses to the WH-questions. This acceptance is translated into our consent and cooperation in conducting the Pilot and Research studies. The directors of the Head Start Centers were contacted and the Pilot study was completed and approval was granted for the research study in the Fall.

There will be 60 boys and 60 girls in the sample. Group I will consist of ten 3 year olds, ten 4 year olds, and ten 5 year olds (boys and girls). Group II will consist of the same ratio of boys and girls as Group I. The study in the Fall will be conducted in Broad Street, Children's, Second Avenue and St. Peter's Head Start Centers.

We will be looking forward to working with you in the Fall.

Sincerely,

Gertrude Tyree
Program Director
CMACAO Head Start
ACTION OF THE REVIEW COMMITTEE

With regard to the employment of human subjects in the proposed research entitled:

**DEVELOPMENTAL DIFFERENCES OF PRESCHOOL CHILDREN'S RESPONSES TO WH-QUESTIONS**

Roger T. Cunningham, Gregory E. Bell is listed as the principal investigator.

Early & Middle Childhood Education

THE SOCIAL AND BEHAVIORAL SCIENCES REVIEW COMMITTEE HAS TAKEN THE FOLLOWING ACTION:

- [ ] Approved
- [ ] Disapproved
- [X] Approved with conditions *
- [ ] Waiver of Written Consent Granted

* Conditions stated by the Committee have been met by the Investigator and, therefore, the protocol is approved.

It is the responsibility of the principal investigator to retain a copy of each signed consent form for at least four (4) years beyond the termination of the subject's participation in the proposed activity. Should the principal investigator leave the University, signed consent forms are to be transferred to the Human Subject Review Committee for the required retention period. This application has been approved for the period of one year. You are reminded that you must promptly report any problems to the Review Committee, and that no procedural changes may be made without prior review and approval. You are also reminded that the identity of the research participants must be kept confidential.

Date: APR 29 1983

Signed: [Signature]

(Chairperson)

cc: Original - Investigator

File

HS-025B (Rev. 7/81)
Dear Parents:

The purpose of this letter is to verify that the following information has been presented during the parent meeting conducted by Mr. Gregory E. Bell, from The Ohio State University.

During the meeting, Mr. Bell discussed the following information with the group:

A. The purpose of the meeting.
B. The tentative arrangements made with Mrs. Tyree, the educational coordinator of CMACO Head Start, and the director of each center involved.
C. The title and purposes of the study.
D. How long your child would be tested.
E. The days and location that your child would be tested.
F. The rights that your child have to participate in the study.
G. What will take place during the testing session (specifically, what would be said to your child).
H. What would happen to the information collected during the test.

As the parent(s) of a potential participant in the research study of Mr. Gregory E. Bell:

___ Has my permission to involve my child,
___ Does not have my permission to involve my child.

In addition, to the above permission, my child must agree to participate in the research study before the testing session begins. If at any time he/she wants to stop answering the wh-questions asked by Mr. Bell the research session must end.

Sincerely,

Gregory E. Bell

__________________________
Parent(s) Signature

__________________________
Director (Witness)
CONSENT FOR PARTICIPATION IN
SOCIAL AND BEHAVIORAL RESEARCH

I consent to participating in (or my child's participation in) research entitled:

Developmental Differences in Preschool Children's Responses to Wh-Questions

(Principal Investigator) or his/her authorized representative has explained the purpose of the study, the procedures to be followed, and the expected duration of my (my child's) participation. Possible benefits of the study have been described as have alternative procedures, if such procedures are applicable and available.

I acknowledge that I have had the opportunity to obtain additional information regarding the study and that any questions I have raised have been answered to my full satisfaction. Further, I understand that I am (my child is) free to withdraw consent at any time and to discontinue participation in the study without prejudice to me (my child). The information obtained from me (my child) will remain confidential unless I specifically agree otherwise by placing my initials here.

Finally, I acknowledge that I have read and fully understand the consent form. I sign it freely and voluntarily. A copy has been given to me.

Date: ___________________________ Signed: ___________________________

Signed: ___________________________ Signed: ___________________________

(Principal Investigator or his/her Authorized Representative) (Person Authorized to Consent for Participant - If Required)

Witness: ____________________________

(The Ohio State University Protocol No. 8380072)

EH-027 (Rev. 12-81) - To be used only in connection with social and behavioral research.
APPENDIX C
SINGLE OPTION STIMULUS CONDITION
PICTURES
1. Who is the dog jumping?
2. What is the girl jumping?
3. Where is the boy running?
5. When is the dog jumping?
6. What is the dog jumping?
7. Where is the girl jumping?
8. Why is the boy running?
9. When is the boy jumping?
10. Who is the dog jumping?
APPENDIX D
MULTIPLE OPTION STIMULUS CONDITION
PICTURES
1. What is the dog jumping?
2. Where is the girl jumping?
3. Why is the boy running?
5. When is the boy jumping?
5. Who is the dog jumping?
7. What is the girl jumping?
8. Where is the boy running?
9. Why is the boy jumping?
10. When is the dog jumping?
APPENDIX E

SINGLE OPTION STIMULUS CONDITION QUESTIONS
1. Who is the dog jumping?
2. What is the girl jumping?
3. Where is the boy running?
4. Why is the boy jumping?
5. When is the dog jumping?
6. What is the boy jumping?
7. Where is the girl jumping?
8. Why is the boy running?
9. When is the boy jumping?
10. Who is the dog jumping?
APPENDIX F

MULTIPLE OPTION STIMULUS CONDITION QUESTIONS

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MULTIPLE OPTION STIMULUS CONDITION QUESTIONS

1. What is the dog jumping?
2. Where is the girl jumping?
3. Why is the boy running?
4. When is the boy jumping?
5. Who is the dog jumping?
6. Who is the dog jumping?
7. What is the girl jumping?
8. Where is the boy running?
9. Why is the boy jumping?
10. When is the dog jumping?
INSTRUCTIONS

The following instructions were given:

WE ARE GOING TO LOOK AT SOME PICTURES. THE PICTURES ARE ABOUT PEOPLE AND ANIMALS DOING DIFFERENT THINGS LIKE RUNNING AND JUMPING. I AM GOING TO ASK YOU SOME QUESTIONS ABOUT THE PEOPLE AND ANIMALS IN THE PICTURES. IF YOU DON'T KNOW WHAT IT IS, YOU CAN ASK ME. DO YOU UNDERSTAND WHAT WE ARE GOING TO DO? WOULD YOU LIKE TO BE IN THE ACTIVITY? OKAY, HERE IS THE FIRST PICTURE. LOOK AT THE PICTURE AND TELL ME "______."