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COBBS, Howard Bruce, 1928-
A STUDY OF THE INFLUENCE OF PRE-KINDER-
GARTEN EXPERIENCE ON CONCEPT DEVELOP-
MENT OF DISADVANTAGED CHILDREN IN THE
FIRST GRADE.

The Ohio State University, Ph.D., 1968
Education, general

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A STUDY OF THE INFLUENCE OF PRE-KINDERGARTEN EXPERIENCE
ON CONCEPT DEVELOPMENT OF DISADVANTAGED CHILDREN IN THE FIRST GRADE

DISSertation

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

By
Howard Bruce Cobbs, B.A., M.E.

* * * * * *

The Ohio State University
1968

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ACKNOWLEDGMENTS

The writer wishes to express his sincere gratitude and deep indebtedness to Lowry W. Harding, his adviser, for the encouragement, support, and advice which he offered so willingly during the writing of this dissertation. A special note of appreciation and respect is extended to Loren R. Tomlinson and M. Eugene Gilliom for serving on the author's reading committee.

Appreciation is extended to Joseph L. Davis, to other members of the administrative staff, and to the teachers of the Columbus Public Schools for their professional attitude and cooperation.

A special thanks is expressed to those who assisted in the data collection and to Elizabeth L. Miller for her diligence and skill in typing this dissertation.

An expression of gratitude is given to the many other individuals who contributed their knowledge, experience, and time to this endeavor.

Recognition is given to the Ohio State University for the facilities and services of the Computer Center.
DEDICATION

This study is dedicated to my wife, Georgia, and to my children, Kimberly, Kelly and Kristen, for their understanding, encouragement and faith.
VITA

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CHAPTER I

INTRODUCTION

The prevalence of poverty and the blighted human conditions which it frequently creates have become of vital concern not only to those who live within but also to those who live outside of the deprived circumstances resulting from subsistant living. The significance of the problem is partially represented in a numerical dimension which, it has been estimated, includes approximately one-fifth of the population of the United States—some thirty-five to fifty million people are poor.¹ Further implication and magnification of the problem are seen in the manifestations of poverty such as discrimination, unemployment, inadequate housing, and inferior educational opportunities which are characteristic in the lives of the deprived.

Although no single institution alone can offer a complete solution to the problems and concerns of the deprived, the school has come to be viewed as one institution capable of providing a positive approach to overcoming certain social, economic, and educational obstacles which confront the disadvantaged. Through a series of legislative enactments, the federal government has made available large sums of money to finance a wide variety of educational programs and opportunities for the disadvantaged. Many of these educational programs and provisions have been

placed in the public schools; others have been relegated to community agencies outside the formal school structure.

Of specific relevance and interest to the study to be described are the Economic Opportunity Act of 1964 and the Elementary and Secondary Education Act of 1965 which contain provisions for the establishment of Head Start and Pre-Kindergarten programs for pre-school disadvantaged children.

The movement to establish pre-kindergarten educational experience for the disadvantaged is supported by a plethora of sociological and psychological data which emphasize the cruciality of the early years of childhood. During the formative period of development, children's learning patterns, attitudinal perspectives, aspirational goals, and self images are rapidly forming the psychological matrixes upon which their future learning and, ultimately, their social, economic, and educational destinations significantly depend. Bloom has summarized research data indicating that environmental factors can have their greatest effect during periods of rapid physiological change; that deprivation in the early years of a child's life may cause irreversible harm if unattended.² He further stated that long term overall effects of living in a culturally deprived, as against a culturally abundant environment, is likely to influence negatively one's intellectual development as much as 20 IQ points.³ Deutsch, discussing


³ Ibid.
the similar effects of deprivation, estimates that up to 60 per cent of lower class children are retarded two years or more in reading by the time they leave elementary school. In reference to concept development and other mental functions, Deutsch says that "functions which are inherent in the child, but which are not stimulated in a restrictive environment do not mature, and so, the lower class child enters school already behind his middle class counterpart in a number of skills highly related to scholastic achievement."

The culturally disadvantaged child comes from an environmental background which is severely restricted in the range and variety of stimuli it provides. This type of deprivation prevents proper growth of cognitive and language skills essential to subsequent learning. On the other hand, the middle class child comes from a home with a "built in curriculum" which prepares him with skills, experiences, and mind sets which are contiguous with the curriculum the elementary school offers. Intellectual and achievement differences between children from a deprived environment and those from a more advantaged one are smallest at the first grade level and tend, from this point, to become more divergent through the elementary school grades. This phenomena, referred to respectively by Deutsch, Jensen, and Hechinger as "cumulative deficit," "progressive achievement decrement," and "deprivation build-up" represents a consensus of thought,


i.e., learning, being cumulative in nature, depends upon prior experience and knowledge as a basis for further learning. Thus culturally disadvantaged children, lacking in cognitive skills and intellectual development upon entering a formal school program meet learning defeat early, and tend to fall progressively farther behind children from middle class environments in academic achievement, language development, and intellectual growth.

Observations and research data, such as those cited, provided the impetus for the federal government to initiate and facilitate massive educational intervention programs for culturally disadvantaged children, namely, Project Head Start under OEO and pre-kindergarten programs under ESEA. Many questions relative to the influence and effect of these preschool intervention programs have been asked; many remain to be answered.

STATEMENT OF THE PROBLEM

There is currently a great deal of interest and effort being directed towards assessing the immediate and long term effects of pre-school programs for the disadvantaged. The investigation, to be described in this section of the paper, is concerned primarily with studying the influence of pre-kindergarten experience upon specific abilities or functions of the disadvantaged child following a lapse of time of approximately eighteen months.

The central purpose of the study is to seek answers to the question: Do pre-kindergarten experiences especially designed for culturally disadvantaged children produce a significant difference in concept development of lower class children at the first grade level with regard to selected
social studies curricular materials? A secondary purpose, correlative with the main focus of the study, is to seek answers to the question: Do pre-kindergarten experiences specifically formulated for disadvantaged children make a significant difference in the development and utilization of selected thought processes, namely, identification, association, and classification?

Stated in terms which permit the utilization of statistical analysis and interpretation, the questions central to the intent of the investigation are presented in the following null hypotheses:

a. There is no statistically significant difference in concept development between and among the sample groups.

b. There is no statistically significant difference in the development and utilization of mental functions between and among the sample groups.

The .05 level of significance is the level of confidence employed in the study for determining significant statistical differences between or among the sample groups as stated in the null hypotheses above. The .05 level of probability was selected as an acceptable level of confidence for the study because obtained differences at this level are not merely chance happenings. Values of this magnitude tend to occur by chance only 5 per cent of the time and 95 per cent of the time because of some significant difference between samples. "The .05 level of confidence has persisted with researchers because it is considered a reasonably good gamble. It is neither too high nor too low for most social scientific research."^6

Pertinent to the main concerns of the study are a series of subsidiary objectives which relate to other important aspects of the central problem. These objectives are:

1. To provide objective data which may serve as one basis for the validation or invalidation of subjective evaluations made regarding the effectiveness of pre-kindergarten programs.

2. To contribute to the accumulation of objective data concerning effects of pre-kindergarten experiences upon disadvantaged children.

3. To provide data which may be utilized in making decisions and judgments relative to curricula for disadvantaged children at the first grade level.

4. To seek information which will assist in determining whether or not formal pre-kindergarten experiences for the disadvantaged recognizably increase the probability of such children dealing more capably with curricular expectations at the first grade level. Specific attention is directed towards the social studies area.

5. To collect and make available data which may be utilized in ascertaining whether or not planned pre-school experiences for children of deprived environments produce a significant carry-over value into the first grade with respect to concept development and/or mental operations.

6. To develop an instrument which will discriminate and differentiate levels of concept development and mental operation utilization among disadvantaged children at the first grade level with regard to social studies concepts.

JUSTIFICATION OF THE PROBLEM

The need for objective evaluative studies of pre-kindergarten programs for disadvantaged children emanates from several factors which were present, and to a considerable extent still are, when the first pre-school programs (Project Head Start) were initiated in the early part of 1965. One significant factor was the expediency with which pre-kindergarten programs were formalized and put into action. The haste
with which programs were conceptualized and instituted permitted only minimal time for evaluative considerations of important components such as selection of disadvantaged pre-schoolers, development of appropriate program, procurement of qualified personnel, and the obtainment of adequate facilities.

A second important factor was the specific and formal attention given to the disadvantaged pre-school child who was new and different in the arena of public education, i.e., it was new from the point of view that this was the first effort of the federal government or any other social institution to establish and provide a national educational program for deprived preschoolers; different from the position that little was known about the lifestyle, the environmental background, and the learning capabilities and potentialities of disadvantaged pre-kindergarten children.

A third relevant condition present in the initial stages of developing pre-school programs was concerned with diversified uncertainties regarding processes by which disadvantaged children learn. Formulated programs were built on various psychological and sociological assumptions, assumptions which were yet to be validated by research and reality application. These psychological and sociological suppositions or hypotheses provide the bases for much of the research which is presently being conducted in the area of pre-school education for disadvantaged children.

Hence, the factors of expediency of program development and implementation, of the new disadvantaged pre-school clientele, and of basic psychological and sociological assumptions which were present in the initial programs for the disadvantaged pre-schooler provide a set of conditions which are directly related to this study. These are discussed below and provide the basis and justification for undertaking the investigation.
1. Evaluations made in close time proximity to pre-kindergarten experiences have provided a limited amount of objective data and have frequently indicated the positive effects of these programs. A substantial portion of pre-kindergarten evaluations have been of a subjective nature based essentially on observations, impressions, and experiences of persons having some type of direct involvement with these programs.

Therefore, one purpose of the study is to add to the accumulation of objective data relevant to the influence of pre-kindergarten programs on disadvantaged children. It is further the intent of the study to provide a basis for substantiating or refuting subjective evaluations of pre-kindergarten experiences.

2. A frequently stated purpose of pre-kindergarten programs for disadvantaged children is that planned pre-school experiences tend to offset the effects of early deprivation with regard to learning capabilities. To accomplish this end, planned opportunities for cognitive development and experiential learning have been proposed with the intent of increasing the likelihood of success of disadvantaged children in the more formalized program of the elementary school.

Therefore, it is a purpose of the investigation to ascertain the probability disadvantaged children have of more adequately meeting academic expectations of the elementary school in relation to formalized pre-kindergarten experiences in which they have participated.

3. The schools, in responding to the needs and characteristics of the disadvantaged pre-school child, have encountered tasks and functions which are new and different and to which there appears to be no immediate solution or definite answer. Factors such as appropriate curricula, viable learning materials, individual learning styles and motivation and
successful teaching techniques and methodology, to cite only a few, have tended to create a whole new area of educational thought: pre-school education for the disadvantaged.

Therefore, it is a purpose of the study to collect objective data which may contribute to the body of knowledge concerned with pre-school education for disadvantaged children and which may be utilized by schools and other social agencies involved in developing, planning, and administering these educational programs.

4. From 1965 to the present the federal government has expended several millions of dollars per annum in sponsoring programs for disadvantaged preschoolers. Federal funds have been appropriated with the expectation that planned educational experiences will provide children of poverty academic and learning skills which will enable them to take fuller advantage of subsequent educational opportunities. Ultimately, it is anticipated that the poverty cycle which is perpetuated through children may be broken by providing a quality educational background; that children in becoming young adults may attain a recognizable degree of economic security and social mobility.

Therefore, it is an intent of the study to collect data which will be useful in determining if planned pre-kindergarten experiences provide the development of selected academic skills which carry over into the first grade level and which tend to increase the probability of children meeting the achievement expectations of the school.

Data collected in the study may be helpful in determining if pre-kindergarten programs for the deprived are generally achieving certain objectives for which pre-school programs have been established. Data
relative to this point may be useful in making judgments and recommendations pertaining to items such as financial appropriations, expanded educational provisions, personnel, and facilities.

PROCEDURES: A GENERAL OVERVIEW

The procedures employed in the study are briefly presented in this section to provide an overview and a general orientation to the operational processes utilized in the investigation. A more detailed and specific description and explanation of procedures are presented in Chapter III.

The study was conducted in the public schools of Columbus, Ohio. The population from which sample groups were drawn consisted of all first grade pupils who qualified according to the criteria established in the study. Members of sample groups were in attendance in fourteen elementary schools which were designated by the Columbus school system as "inner city" schools according to specific criteria established by the central funding agency.

The samples used in the study were made up of one hundred fifty first grade, disadvantaged children who were selected on the basis of the kind and amount of formal school experience each child had had prior to his entrance into first grade. Children included in the study were categorized into three sample groups according to the nature and duration of pre-first grade educational experiences. Each of the three sample groups was composed of fifty disadvantaged children: twenty-five females and twenty-five males.

A Professional Judgment Questionnaire was developed by the investigator and was submitted to pre-kindergarten and first grade teachers for the purpose of validating the content which was subsequently incorporated into the development of the test instrument used in the study.
The instrument utilized by the investigator to collect data consisted of several series of pictures and correlated sets of questions. The pictures and questions of the test instrument were designed to represent concepts and topical areas of the social studies which had been determined to be relevant to the instructional programs of both pre-kindergarten and first grade. A sample copy of the test instrument appears in Appendix D.

The original test instrument was trial tested with a sample of disadvantaged first grade children who were similar in background and experience to children in the study sample groups. The trial administration of the instrument provided data for reviewing test items and preparing the test in revised form.

With reference to the main part of the study, the test was administered to the sample groups approximately eighteen months after the children had completed formalized pre-kindergarten experiences. The test was administered individually to each child.

DEFINITION OF TERMS

Terms which are relevant to the study are identified and defined below. The definition and explanation of terms encompassed in the study are given to establish a basis for understanding and to provide a degree of definitiveness for the study.

Concepts of the Social Studies.--This term is more appropriately defined by examining its component parts: "concepts" and "the social studies." A concept, as defined by Darrow, is a formulated mental image which is a result of that which a learner has internalized, that which he has revised and qualified for himself. It is an abstraction, a mental identity which is created
by and developed through the personal and psychological ordering of experiences. Brownell and Hendrickson state that a concept, although identified by an arbitrary association (a word), is more than a word, it is an abstraction which applies to a class or group of objects which have certain qualities in common. These definitions appear to be reasonably representative of definitions offered in current literature and will, therefore, serve as a basis for the definition of concept used in the study, i.e., a concept is a mental abstraction or association developed by a learner which tends to classify and/or relate personal experiences which are of a similar nature or character.

The social studies, as described by Michaelis, is that aspect of the elementary school curriculum which deals with "the study of man and his interaction with his social and physical environment in the past, present, and emerging future." Clements and others define the social studies as "a study of human variety: people, their acts, and their arrangements for living."

The social studies, in this investigation, refers to that portion of the elementary school curriculum which is concerned with the study of man and his relationships with his physical and social environs. Thus, as the

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terms "concept" and "the social studies" and their meanings are brought into
the relationship established in the study; the expression "concepts in the
social studies" is defined as those synthesized mental images or impressions
held by disadvantaged children at the first grade level which have been for-
mulated out of personal experiences and which are related to human function-
ing and activity. The concepts of the social studies are more specifically
and operationally defined by the instrument which was employed to collect
data and to measure concept development among disadvantaged first graders.
Generally, the social studies concepts utilized in the study are categorized
under the topical or substantive headings of home, neighborhood, and commu-
nity. Specific concepts in these topical areas are more descriptively
treated in Chapter IV and are identified in the test instrument.

Culturally Disadvantaged.--The term "culturally disadvantaged," although
having variable connotations and meanings, is generally used to describe or
refer to those adults and children whose background and environment do not
provide the opportunities and advantages available to the more privileged
social-economic classes. Terms such as economically, socially, and educa-
tionally disadvantaged or deprived are also frequently used in referring to
people who live in substandard conditions and circumstances.

The term "disadvantaged" was legally defined in 1964 in Public Law
88-665, section 1101. Under this legal provision, the disadvantaged were
interpreted to mean children from families outside the mainstream of
American culture who, due to their circumstances of poverty, have been pre-
cluded from taking advantage of educational opportunities, who have been
discriminated against by American society, and who, for external reasons, have not been able to develop their potential.\footnote{Gordon J. Kropf and Grada U. Bowman, Teacher Education in a Social Context (New York: Mental Health Materials Center, Inc., 1966), p. 36.}

The Office of Economic Opportunity has identified the disadvantaged by more specific criterion, i.e., by an economic classification derived from the utilization of an Index of Poverty which uses household size and levels of family income as a basis for defining deprivation.

For purposes of the study, the term culturally disadvantaged refers to those children who come from deprived environments which are characterized by poor housing, low income, unemployment, school dropouts, minority groupings, and a general lack of affluence and social-class mobility.

Operationally defined, culturally disadvantaged include those deprived children who are currently enrolled in the first grade in specified elementary schools and who fulfill the criteria established in the study for defining the population. Further delineation and refinement of the term culturally disadvantaged is given in Chapter III.

Mental Operations.--The process of concept development requires, among other mental activities, certain fundamental thought processes such as identification, discrimination, accommodation, and assimilation. Mental processes such as these are necessary in differentiating between various stimuli and in grouping perceptual responses into diverse classifications and relationships which are inherent in and essential to the development of concepts. Russell states that "initially, very young children's perceptions are relatively
vague, diffuse, and undifferentiated. Through a process of differentiation, perceptions become more refined; as they are refined and related, they form concepts.12

The mutual and reciprocal relationship between concept development and fundamental thought processes, denoted in the study as mental operations, is utilized to maximize data output gained from the study and to determine if selected mental operations which have important implications for subsequent school achievement are effected by planned pre-kindergarten experiences.

It is not an intent of the study to deal in a comprehensive manner with the detailed complexities of thinking. The purpose is more of a delimited nature and is concerned with selected mental operations which are representative of more complex mental processes.

Mental operations are defined in the study as those thought processes which require a child to differentiate and discriminate among presented perceptual stimuli. In behavioral terms, mental operations are defined as acts or behaviors displayed by a child in response to perceptual and verbal stimuli which necessitate not only a certain kind of mental activity but also the overt act of pointing to specific pictures included in the test instrument. The specific mental operations employed in the study are:

1. Identification--the act of identifying specific objects, things or situations. This entails knowing specifics.

2. Association--the act of perceiving relationships between objects, things, and situations. This involves denoting a relational connection between two or more quantities or qualities.

3. Classification—the act of categorizing common factors or characteristics among objects, things, and situations. This entails recognizing certain systematic relations among specified quantities or qualities.

**Pre-kindergarten Experience.**—The central concern of the investigation was to study the influence of formalized pre-school programs upon specific quantities or characteristics of disadvantaged children in the first grade. Pre-kindergarten experience as designated in the study refers to an especially designed pre-school program for children from deprived backgrounds; developed and initiated for the purpose of providing increased educational opportunities which may ultimately lead to successfully interrupting the cycle of poverty.

The term pre-kindergarten is used in the study to differentiate this particular pre-school program from the Head Start program which too is a specifically planned pre-school educational experience directed toward the educational needs of disadvantaged children. The difference between pre-kindergarten experience as used in the study and the Project Head Start program is basically a technical one, the former program being funded under ESEA and the latter being funded under OEO. Although different in name and in the source of federal funds, both Project Head Start and the pre-kindergarten programs are nearly identical in the educational curriculum offered. The pre-kindergarten program like Project Head Start, has a philosophical base which emphasizes the child development concept. In this concept, the child and his environment are represented as a totality with specific attention being given to various aspects of health, education, and welfare. The broad scope perspective of the pre-kindergarten program presents a comprehensive front in seeking to alleviate or change conditions and effects of deprivation among children and their families. Through the child
development approach, every effort is made to ensure that the impoverished child is provided services necessary to narrow the gap between him and his more advantaged peers.\(^\text{13}\)

Within the comprehensive approach of pre-school programs for disadvantaged children are more specific aspects of the curriculum designed to extend the experiential base of the disadvantaged youngster and to develop certain understandings, skills, attitudes, and behaviors.

Pre-kindergarten experience in the study is defined as those components of a distinctively structured pre-school program for disadvantaged children instituted to develop understanding and comprehension of identifiable social concepts. The pre-kindergarten program directly related to the central hypotheses of the study was operative during the time interval of February to August of 1966. Detailed description of the pre-kindergarten program employed in Columbus schools may be obtained from the following publications:

1. Booklet Series (8)
   Project Head Start
   Community Action Program
   Washington, D.C.

2. A Resource Guide for Pre-Kindergarten Teachers, 1967, Division of Special Services, Columbus Public Schools, Columbus, Ohio

   Submitted to the Office of Economic Opportunity
   Columbus Public Schools
   Columbus, Ohio

   College of Education and School of Home Economics
   The Ohio State University
   Columbus, Ohio

   A Manual of Policies and Instructions
   Community Action Program
   Office of Economic Opportunity
   Washington, D.C.

SCOPE AND LIMITATIONS OF THE STUDY

The nature of the problem and the general research design used in the study suggest recognizable constraints with respect to the interpretation and application of data derived from the study. These constraints, expressed in terms of scope and limitations, are listed and briefly discussed below.

Generalization of Findings. -- The results of the study will be generalized, most specifically, to the population from which the sample was drawn, i.e., culturally disadvantaged children in the city of Columbus, Ohio, who entered first grade in September of 1967, and who were exposed to an especially designed pre-kindergarten program which was operative from February to August of 1966.

However, it should be noted that Columbus, although not characterized by extensive heavy industry, is similar to many other cities of comparable size in its social, economic, and educational structure. Less desirable sections of Columbus tend to attract persons of lower socio-economic levels and members of minority groups and to represent areas where the poor are concentrated. This concentration of low income people tends to create a homogeneity of poverty within confined geographical areas of the city. Likewise, conditions and influences of poverty which produce common problems among the poor such as discrimination, prejudice, unemployment, and lower educational achievement, although possessing some unique dimensions at the local level, have a universality which transcends the particulars of a given community. Similarly, the pre-kindergarten program in Columbus has important elements in common with pre-school programs in other communities across the nation not only with respect to the disadvantaged children it serves but also to the source of funds which support such programs and to the curricular guidelines which provide a structuring of educational experiences.
Because of the homogeneity of social, economic, and educational factors concerning the poor, there is a strong probability that inferences, conclusions, and recommendations drawn from the study have applicability and generalizability to populations and pre-school programs beyond those employed in the study.

**Sample Group Equivalence.**—Working within limits of an ex post facto design, an important consideration of the study was that of establishing some type of equivalency measures among groups prior to their participating in a planned pre-kindergarten program. Pre-measures were not taken of either individual or group characteristics in instituting pre-kindergarten classes. Therefore, measures or data were not available for determining sample group qualities or quantities prior to pre-kindergarten treatment.

Children who made up the population from which sample groups were selected, were neither randomly selected nor assigned in any prescribed manner at the point of establishing pre-kindergarten classes. Initially, those children enrolled in pre-kindergarten classes were taken on a first come first serve basis. Consequently, due to the fact that pre-measures of children participating in pre-kindergarten classes were lacking and that randomization was not utilized in establishing groups experiencing the pre-kindergarten program, the assumption that original groupings were of an unbiased or homogeneous nature before pre-kindergarten programs were experienced contains a degree of uncertainty.

Within the limitations posed by uncertainty of sample group characteristics, a series of provisions were made in the study to minimize the restrictions of this condition. First, criteria were established for defining the population to attain some degree of control over relevant factors. Second, random selection was utilized in drawing sample groups from the defined
population. Third, data were collected at the time of the test administration which were helpful in establishing sample group parameters. The techniques employed to formulate measures of homogeneity with respect to population characteristics prior group participation in pre-kindergarten experiences are more completely described in Chapter III.

Although the previously stated techniques were utilized to establish sample group equivalency, it is recognized that conclusions of the study are subject to the limitations of the uncertainty of group homogeneity prior to pre-kindergarten experience.

Kindergarten—First Grade Experience.—From the completion of pre-kindergarten to the point of data collection there existed an eighteen-month interim period during which members of sample groups participated in other planned educational programs, namely, a full year of kindergarten and six months of first grade. These intervening educational experiences suggest alternative considerations regarding the interpretation and generalization of data provided by the study. The educational exposure received in kindergarten and first grade possessed an inherent potentiality and possibility of effecting changes in the characteristics and qualities investigated in the study. The influences of the interim educational experiences may minimize or contribute to the dissipation of changes in behavior or learning directly attributable to the pre-kindergarten program or may positively support concept development and thinking processes, thus contributing directly to achievement differences in these two areas. This condition is theoretically minimized through the application of randomization. Members of sample groups were selected randomly to attain some degree of normal distribution among the effects of kindergarten and first grade instruction.
The study was limited with reference to controlling or accounting for quantity differences attributable to the diffusion process which has a tendency to minimize initial gains among children over a given period of time.

Curricular Area.--The study was specifically concerned with the content area of the social studies rather than dealing more broadly with other aspects of the elementary school curriculum. Therefore, it is recognized that conclusions and recommendations evolving from the study are directed to this curricular area and are not intended to relate to other subject areas or activities.

The fact that the social studies at the pre-kindergarten and first grade levels of instruction were of an indefinite and general nature made identification of social concepts at these levels somewhat elusive. Pre-school and first grade programs contained a considerable amount of curricular materials which were integrative and correlative in nature. These instructional materials were representative not only of the social studies but also other subject and activity areas in the respective curricula.

A Professional Judgment Questionnaire was developed by the writer and submitted to pre-kindergarten and first grade teachers to identify concepts a) which had a social studies orientation and b) which had been given instructional emphases and time. The development and utilization of the questionnaire is explained in a more detailed manner in Chapter III.

Psychological Parameters.--The multi-dimensional nature of pre-kindergarten programs and of the disadvantaged children for whom these experiences were developed suggested unlimited possibilities for a wide variety of research studies in this area. Therefore, there was a need to delimit individual research to specifics and to concentrate upon selected aspects of the total problem. The central focus of this study dealt in a limited manner with two
psychological parameters: concept development and thought processes. Other dimensions of social, emotion, and psychological behavior, although vitally important to the area of pre-school education, were not within the intended scope of the study. As a consequence, data from the investigation had been confined to inferences and conclusions relative to the development of concepts and to the utilization of mental operations as defined in the study and as determined by disadvantaged children in first grade.

The test instrument developed for the study likely contained certain cultural biases which were due in part to the background of the writer and to the socio-economic status of pre-kindergarten and first grade teachers whose professional judgments were utilized in determining and validating the content of the test. This limitation of cultural bias is recognized in many commonly used intelligence tests. The Davis-Eells Games and the Draw-A-Man Test which were designed to overcome cultural bias contain certain test items, which in response to, reflect the influence of the examinee's cultural background.

The fact that the test was developed to determine concept development of the deprived child relating to content areas incorporated into the instructional and curricular programs of pre-kindergarten and first grade rather than to ascertain the type of knowledge possessed by the disadvantaged child as a result of living in a particular environment suggests, in and of itself, a cultural favoritism--one which the deprived must currently deal with.
CHAPTER II

A REVIEW OF THE LITERATURE

The intent of the author in writing this chapter was to present a review of the literature which is relevant to the primary interest of the study: the influence of pre-school programs upon the concept development of disadvantaged children in the first grade. The first portion of the chapter is concerned with the literature which deals with the meaning, formulation, and utilization of concepts among young children. This is followed by a discussion of the literature which focuses attention upon thinking processes relative to concept formation and the utilization of mental operations inherent in concept attainment. The latter part of the chapter summarizes research studies directly related to Head Start or pre-school programs. In this section, studies are classified according to the particular time period in which evaluations were made relative to the respective pre-school programs utilized in the investigations.

The review of the literature of the study is oriented towards the present status of the field rather than towards a historical perspective of concept attainment. The historical position appears to be well documented in such references as the Encyclopedia of Educational Research, the Handbook of Research on Teaching, psychology textbooks, dissertations, and journal articles on concept formulation and growth.
Curti had written a historical study concerning concept development and attainment. Research on concept development had been summarized by Smoke (1946), Vinacke (1951), and D. H. Russell (1954). Although certain studies and references with historical orientations were consulted as a basis for viewing and studying the present thinking regarding concept formation and growth, it seemed more appropriate to utilize information of a more timely nature because of the character of the problem. Therefore, studies and references cited in the following discussion of the literature are essentially products of the last decade. Detailed historical documentation had intentionally been limited.

Concepts.--Concepts and their development are primary components of psychological functioning, mental development, and school achievement. Because concepts are essential to the intellectual growth of an individual, they are of a fundamental concern to educators and the educative process. Concepts are considered by psychologists and educators to be basic to thinking processes and to psychological matrixes for organizing, retaining, and using knowledge. Furthermore, the great increase in the accumulation of knowledge and the availability of content materials have caused educators


and scholars to focus their attention on the development and utilization of concepts within the school curriculum and instructional program.

The development of concepts is the means by which stimuli and subsequent perceptions are organized into some meaningful abstraction or mental image. A child learns to deal conceptually with the universe—a universe he has constructed for himself. A newborn child possesses a nervous system ready to receive and respond reflexively to stimuli. Initially, he does not understand the signals but learns to relate and associate sets of cues. As he does, he begins to define reality. Perceptions gain meaning and the child begins to know what they signify. Through conceptualization, he learns to represent physical action by mental imagery and thought has begun.

Bruner defines a concept as "a network of inferences that are or may be set into play by an act of categorization." He views concept learning as the acquiring of a common response to a class of objects varying in appearance. Concepts are idiosyncratic in nature and develop within the individual according to his experiences and his capacity or ability to discriminate, organize, and classify these experiences in some personalized manner. Concepts are the mental equivalents to actualized experiences, and as Michaelis asserts, ideas generalized from particulars and detached from specific experiences. They are properties of experience and are formulated out of series of experiences which are similar with regard to certain aspects and differentiated from others in

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certain characteristics. The psychological grouping of similarities as well as the mental denoting of differences are fundamental to concept learning. Likewise, the abilities to identify, differentiate, and categorize are inherent in the development of concepts.

The development of concepts in young children is essentially an inductive process. The child mentally accommodates and subsequently assimilates various perceptions of wholes and parts and classifies these sense impressions according to similarities and differences as they relate to previous experiences which have been internalized and organized. Initial concepts tend to involve common objects and situations of the immediate environment, and as a child matures and his range of perceptual experiences increases, his concepts usually become broader in scope and reflect a greater degree of understanding and abstractness.

Concepts develop from sensations extracted by the child from environmental stimuli. The immediate awareness to stimuli is in the form of perception, the sensitivity to an object, quality, or relationship. Perception is the process by which environmental data is taken in, interpreted, and organized by the organism and from which concepts emerge. Initially, young children's perceptions are gross and vague but, through a process of differentiation and discrimination, they become more refined. As they become more refined, related, and generalizable, they form concepts. The type of experiential background in which a child lives has important ramifications as to his perceptual learning, and ultimately, his conceptual development. Almy, in reviewing Piaget's work, states that he feels "The most basic ideas are those that a child is first able to group. Knowledge arises and becomes organized as a child interacts with his environment."  

An ingredient important to perception and concept learning is that of experience, i.e., the doing, the involvement of a child as he interacts with his environment. It is the contact, the awareness, the process of actualization which provides a child with sense impressions which are internally distilled and personally fabricated into abstract mental representations of experience. Darrow states that experience itself seems to count as the greatest single factor in conceptual learning, outweighing both mental age and vocabulary strength.\textsuperscript{8} Breadth of experience, Harlow points out, rather than intensity of training appears to be the key to efficient concept development.\textsuperscript{9} Children develop breadth and depth in their concepts only after much first-hand and vicarious experience in the particular area involved. Piaget has remarked "that experience is always necessary to intellectual development and that physical activity and social interaction are ingredients of experience."\textsuperscript{10} A child's concepts represent and reflect his understanding of his world. As a child experiences, he sorts, classifies, and relates these experiences according to mental references which he has established from prior exposures to stimulation. New experiences bring new meaning to previously held concepts. As this occurs, meanings of experience are converted into various memory traces and prepare the child with different psychological perspectives for subsequent experiences. Hunt states that, according to Piaget

\textsuperscript{8} Helen F. Darrow, "Research: Children's Concepts," \textit{Childhood Education}, XL (January, 1964), 249.


"the more things a child has seen and the more he has heard, the more things he is interested in seeing and hearing. Moreover, the more variation in reality with which he has coped, the greater his capacity for coping."

Deutsch, similarly emphasizing the importance of experience, indicates that "a child from any circumstance who has been deprived of a substantial portion of the variety of stimuli which he is maturationally capable of responding to is likely to be deficient in the equipment required for learning."

Lacey (1932) studied concept development among first, second, and third grade children and found that concept attainment showed progressive growth through each of the grades and that age and experience were directly relevant to fuller understanding of the social concepts utilized in the investigation. A study by Lowry (1963) to determine common concepts among second graders in four major topical areas found there were statistically significant differences among areas measured and thus concluded that children have more knowledge in some areas than in others. A study of social studies information at the beginning of second grade children by Mugge (1962) showed that children who had had a wider variety of experience tended to obtain higher scores on a social studies information test than those with a more limited variety of experience.

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experience. Robinson, in teaching rather sophisticated economics concepts to kindergarten children, found that most learning occurred in concepts where direct experiences were utilized. Drawing a similar conclusion from a study of first grade children regarding the nature and deviation of social concepts, Huck stated that direct experience was the most frequently cited source of tested knowledge and that active contact with environmental persons, places, and things provided the most accurate source of information.

Research data such as these tend to substantiate the fact that experience plays a vital role in concept development, and that as a child encounters a wider range of experience there is a corresponding variation in his concept meanings and his ability to deal more abstractly with environmental stimuli.

The findings of research and the conclusions of authors in the area of concept development have important implications with reference to the intellectual development of disadvantaged children. Deprived children experience life in a circumscribed environment, geographically and experientially. They are limited in the range of perceptual things which, in more advantaged environments, normally provide extensive opportunities to identify, differentiate, relate, and classify various experiences. They are restricted in their relationship with adults which, in middle-class homes, contribute importantly to verbal interchange and to the utilization of words or symbols for abstract

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ideas. Relative to this, one of the fundamental purposes of pre-school programs for the deprived is to provide an enriched experiential program to offset the effects of deprivation and to establish a basis for intellectual growth and development.

All learners, deprived or advantaged, develop concepts which are variable in dimension and meaning. This points to an important characteristic of a concept—its differential quality. It is, as Henry and Brown affirm, "The way a concept is acquired—its genetic development in the learner—that determines the quality of the concept attained." Each child or adult, in the process of developing concepts, usually creates within a particular concept certain characteristics or qualities which tend to be commonly understood and accepted by others. A common definition of an abstraction, labeled with some arbitrary association like words or some other symbolic representations and the personal knowledge possessed of a particular abstraction, enable persons to communicate certain ideas and understandings. Yet, within each concept or its symbolic counterpart, there is a personalized meaning which is unique to the individual, and which, at times, tends to confound and complicate communicative processes. Concept attainment is not only affected by the content or knowledge which an individual's experiences produce but also by the psychological functions which facilitate the incorporation of selective data into some meaningful, usable form.

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George Henry and John A. Brown, *An Inquiry Into the Nature of Concept Development Within the On-going Classroom Situation* (Newark, Delaware: University of Delaware, 1965), p. 79.
Concept development and growth is a continuous, accumulative, interactive process. As one encounters new or different experiences, concepts in these areas take on different dimensions and provide the learner with additional psychological data for future experiential learnings. Levels of concept development seem to involve a hierarchy of understanding, each advanced stage being dependent upon prior conceptual attainment. In recognizing the evolving nature of concepts, Russell describes them "as moving along a continuum from simple to complex, from concrete to abstract, from undifferentiated to differentiated, from discrete to organized and from ego centric to more social."19 Although the growth of concepts is the result of an orderly, sequential accumulation and assimilation of knowledge, children of the same chronological age group demonstrate a wide range of understanding among different kinds of concepts. Differences in levels of concept understanding are the result of a child's ability or inability to extract meaning from his experiences and to organize sense impressions in some logical manner. Likewise, the type of environment, enriched or deprived, in which a child lives may significantly influence his capacity to relate experiences. Depending on a child's intellectual capacity, his experiences, and his environmental background, he may know a concept in varying degrees, i.e., thoroughly, partially, inaccurately or not at all. Henry and Brown have summarized several studies in psychology which have shown that past learning with non-verbal materials can be a "determining tendency" in present learning. They make the point that "one truth can be so held as to resist or block deeper and other dimensions of itself."20

This has special relevance for disadvantaged children, for their environment

19 Russell, op. cit., 249.
20 Henry and Brown, op. cit., 205.
and cultural patterns encourage concepts and understandings of a particular nature which are, in many instances, discontinuous with ideas and expectations of the school and of the broader society. This difference in perceptual skills and conceptual knowledge potentially inhibits satisfactory or progressive school learning.

Children usually develop a great many concepts before coming to school and continue to exhibit growth of understanding in these and other areas from both in school and out of school activities. Misconceptions held by a child are the result of limited experience and the opportunity and/or the ability to utilize adequately environmental data. Variety of experiences provides reference points for concept development and understanding. The greater the range of experience, the greater the probability of a child's attaining fuller concept development with respect to his level of maturation.

According to Russell, knowledge of concepts is related closely to background of experience and positively to such factors as chronological age, mental age, socio-economic status, and in some cases sex.\(^\text{21}\) He further states that, in children, concepts seem to be related somewhat more closely with chronological age than to mental age.\(^\text{22}\) The direct correlation of such factors to levels of concept development accounts, in part, for the great degree of variability of concept attainment among children. Because of their direct relationship to concept development and growth, the factors of chronological age, socio-economic status, and sex have been incorporated into the design of the study.

\(^{21}\) Russell, op. cit., 163.

\(^{22}\) Ibid., 249.
Concepts represent a totality of experience, the understanding and knowledge a child has of the world. It is, therefore, apparent that levels of conceptual development have direct relevance to school learnings and expectations. Taba has stated that concept development can be considered the basic form of cognition on which all other cognitive processes depend.  

The meaning and understanding associated with concepts are, likewise, important to language development and usage. Language serves as a symbolic representation of experience and is used as a communicative device to share personal interpretations of perceptual happenings. The acquisition of language is a central feature of a child's intellectual development. Huttenlocher states that by the time a child is three and a half, his speech, from a syntactical point of view is very similar to adult speech, i.e., the child has developed implicit rules for combining words. This presents a communication as well as a psychological problem to the deprived child for the speech patterns in the culture of the poor are noticeably different from those normally represented in the school. Disadvantaged children have weaknesses in the utilization of normative abstract symbols to represent and interpret their feelings, experiences, and environmental surroundings. Ausubel concludes that a delay in the acquisition of certain formal language forms results in difficulty in the transition from concrete to abstract modes of thought. A child's knowledge, although not identical with his vocabulary,


has been found to be closely related to his verbal ability. Concept development is both independent of and dependent on language processes. Bernstein, an English sociologist, points out that the lower class tends to use informal language and mainly to convey concrete needs and immediate consequences, while the middle-class usage tends to be more formal and to emphasize the relating of concepts.

It is generally recognized that deprived children do poorly in academically oriented learning as it is presently defined by the school. Reasons for this begin to appear rather early in the life of a disadvantaged child. At approximately eighteen months of age, deprived children start trailing their middle-class age mates in tests of general intelligence and language development.

Research consistently reveals that disadvantaged children generally have lower I.Q. scores as measured by standardized intelligence tests. Also, they have been found to have inferior auditory and visual discrimination abilities. In conceptual abilities, the lower-class child has been found to have greater difficulty with abstractions than does the middle-class child. As the disadvantaged proceed through school, they tend to fall progressively further behind their middle-class counterpart in general school achievement. It is estimated that by the sixth grade, disadvantaged children as a whole are retarded two years or more in reading achievement. Between the first grade

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26 Russell, op. cit., 22.
and high school many children with deprived backgrounds show a drop of as much as twenty points in I.Q. 29  The substandard performance of disadvantaged children in academic achievement is related directly to noticeable differences in environmental background, concept development, learning skills, and language facility. According to Russell, "the clarity and completeness of a child's concepts are the best measure of his probable success in school learning because meaning is fundamental to such learning." 30

Henry and Brown have summarized various studies pertaining to concept formation, attainment, and development and have devised a list of theoretical constructs about the nature of conceptualization as a process applicable to educational method. Selected statements presented by Henry and Brown summarize much of the previous discussion of concept growth and understanding and seem appropriate as a concluding commentary to this portion of the chapter. These statements are:

1. A concept is best learned through the progressive development of meaning rather than as products or finished definitions.

2. The strategy of concept development is best acquired by exploration (heuristics) rather than by a step-by-step direction (algorithmics).

3. A concept is best developed as it serves to harmonize more and more cases and discriminates among these cases. A concept is not a storing up of many cases.

4. A concept is very personally held despite the fact that it is a common strategy for all pupils.

5. A concept is to be perceived as a synthesis, a creation, not as an aggregate of instances or a list of common elements, or a family likeness; different concepts may stand in relationship to their elements in different ways.


30 Russell, op. cit., 120.
6. The process of developing a concept is basically the same despite variations in the pattern and content of subject matter. Although one concept may be quantified more precisely than another, the "mind" creates concepts in the same operational way.

7. The fact that a concept is never fully learned is part of the realization of its attainment.

8. A concept is a set of strategies in inventing a web of relations.\(^{31}\)

Thinking Processes.--Concept development and thinking processes are mutually supportive of and reciprocal to one another. They are not only intricately interrelated to each other but also to many other human factors of growth and intelligence. Various thought patterns or activities are inherent in the development and growth of concepts. Likewise, concepts or abstractions are essential ingredients of thinking and logic. Thinking may be generally considered as a determined source of ideas, symbolic in nature, initiated by some problem or task, and leading to a conclusion. It is a process involving a sequence of ideas moving from some beginning, through some sort of pattern of relationships, to some objective or goal.\(^{32}\)

Approaches employed to study and to analyze the various psychological aspects of thinking have evolved different kinds of categories or systems of classifications. Psychologists and/or educators do not completely agree upon terminology, the meaning of terms, or the psycho-physiological process associated with thought. Much of what is known about the internal processes of thinking is represented by theoretical constructs. In some differentiations, thinking is characterized by mental operations such as comparing, summarizing, observing, classifying, interpreting, and criticizing. In others,

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\(^{31}\) Henry and Brown, *op. cit.*, 122-123.

\(^{32}\) Russell, *op. cit.*, 27.
thinking is analyzed through the utilization of other types of psychological functions such as meaning, relationship, defining, generalizing, analyzing, associating, selecting, and inferring. In these classifications, as in other variations that seem to be available, it is the product of thinking which is utilized and analyzed in an effort to understand the process of thought, the behavior exhibited by the doer as a result of engaging in some type of psychological activity, and not the thinking process itself. Russell recognizes different levels of thinking which represent a hierarchical relationship, moving from the more elementary processes to the more complex processes. He classifies thinking with respect to distinguishable characteristics of thought in terms of definitiveness of goals or conclusions to be reached. Levels of thinking identified by Russell are:

a. Perceptual thinking. A type of thinking which is a response to a stimuli. It is least directed to a conclusion.

b. Associative thinking. A type of thinking which exhibits some direction towards an objective. It is more than random behavior.

c. Inductive-deductive thinking. A type of thinking which leads to concept formation or conclusion. It is more direct and brings together a series of related experiences.

d. Problem solving. A type of thinking in which the organism is conscious of a particular problem and psychologically initiates or seeks alternative solutions to the problem.

e. Critical thinking. A kind of mental function which necessitates making critical judgments concerning certain decisions and judgments. This type of thinking is frequently a component of other classifications of thinking.

f. Creative thinking. A category of thinking in which one goes beyond a routine solution of a problem to a new or different synthesis or creation. It infers an intuitive, creative conclusion of or response to a problem situation.33

Not all Russell's categories of thinking were directly relevant to the purposes of the study because they represented levels of thought processes different than those investigated and because they are characteristically related to developmental thought patterns of more mature persons, and consequently not applicable to, or possibly not attainable by, disadvantaged children in the first grade.

Although the study did not specifically utilize the levels of thinking presented by Russell, it sought to identify and employ mental operations inherent in the first three of his categories. The mental operations were not considered as process, per se, but as functions or behaviors which were called upon in the thinking process. Each of the mental operations defined in Chapter I, i.e., identification, association, and classification were relevant to these levels of thinking, different in the type of mental activity or ability each required, and characteristic of the process of concept development. The interest in selected mental operations within the study emanated from their relevancy to concept development, their relationship to differentiated levels of thinking, and their importance to psychological and learning objectives normally assumed by elementary schools. The study of defined mental activities employed in the investigation provides only a limited sampling of the more sophisticated and complex processes involved in the broader aspects of thinking. It is rather commonly agreed that perception and conception can be enhanced and improved through directed effort. One way to develop and refine such abilities is to be conscious of and concerned with the psychological means by which they occur. The processes of identification, of differentiation, of seeking relationships, and of classification are representative of these psychological behaviors.
The process of concept development involves a sequence of intellectual activities: perception, differentiation, generalization, and conceptualization. Perception is the act or process of becoming aware of environmental stimuli: the personal sensitivity to that which creates a sense impression. Differentiation is the act or process of discriminating among various aspects of stimulation: the ability to distinguish or recognize differences among perceived parts or wholes. Generalization is the act or process of grouping perceptual responses into an established or created classification or relationship which tends to represent common factors or characteristics: the psychological facility to synthesize perceptions in some meaningful manner. Conceptualization is the act or process of creating or developing psychological imagery from experienced happenings: the ability to assimilate and incorporate new sensory data into new or previously formed abstractions. Each phase of the process of concept formation and growth necessitates, among other behaviors, the employment of thinking skills or mental operations. The development of thinking processes which facilitate the response to and the grouping of experiences enables one to develop more accurate concepts and to learn more readily and systematically.

Piaget has devised a hierarchical taxonomy of psychological development with reference to thought processes. His "stages of logical operations" propose a sequential development of thinking processes and abilities which begin with a sensori-motor period in which a child relates to his world with elementary responses, and progress to formal operations in which a person deals with the abstract without reference to the actual. Conditions influencing the moving from one level of thinking to a higher level of abstract functioning include such factors as maturation, experience, social transmission (encounters

\[34\] Almy, op. cit., 17-18.
with adults), and equilibration or self regulation. Almy states that in low-class neighborhoods children tend to function at the pre-operational stage into the second and third grades possibly as a result of the operation of these factors. On the other hand, she states, children from middle-class environments move more consistently and more rapidly beyond the pre-operational stage into higher levels of thinking.35

According to Piaget's taxonomy of logical operations, all or the great majority of disadvantaged children included in the sample groups of the study were at the "pre-operational representation stage" with reference to the development of thought processes. In other words, children, especially disadvantaged youngsters, at the chronological age of six and seven are capable of responding to an object or an objective psychologically but the thought processes representing the action are not yet reversible. Logical operations become reversible when that which is added can be subtracted, and that which is joined can be separated—the ability to mentally hold an object in a fixed state and analyze or alter its components.

The child's abilities in recognition and recall grow much as his perceptual abilities grow, states Russell. As he develops the ability to analyze and perceive whole patterns, with clear relationship between parts, so he develops a memory for details and the logical relationship among them.36

There is a considerable amount of evidence that perceptual judgments can be improved. Pre-school and kindergarten programs stress the development of a fund of valuable precepts and correlative mental processes as a basis for further learning. Studies by Machnits, Jonas, and Martin show that stressing

35 Ibid., 19.

36 Russell, op. cit., 98.
thinking processes tends to increase achievement in subject areas. Although these studies were conducted in grades three, four, and five, it seems probable that similar effects would be attainable in the early primary grades. Research efforts by Bereiter using a highly structured, academically oriented pre-school program seem to confirm this assumption.

Classifications of thinking and the ability of children to function at a particular level at a given age are overlapping and flexible. Levels of thinking are not rigidly defined categories but are rather, general labels applied to certain kinds of thought processes used to identify, analyze, and study various types of psychological behavior. There is general agreement that thinking is a developmental, maturational ability which becomes more refined, complex, and versatile as children develop psychologically and intellectually. Current thinking indicates that young children are capable of different types of thought processes, most of which are similar in pattern to adults, the difference being the materials used for thinking and the ultimate product of thought. Knowledge does not guarantee good thinking, but high level thinking is dependent upon knowledge. Psychological materials, i.e., precepts, images, memories, and concepts are critical to thought. These can be taught and learned. It is with the disadvantaged child that he is limited both in the materials for thinking and in the psychological skills essential to processing and utilizing environmental and psychological data. The available evidence seems to indicate that the pre-school child is capable of using each of the thought processes identified by Russell, but that his conclusions are hampered by the lack of data to manipulate or knowledge by which to judge.

37 Ibid., 304-305.
Based on a limited amount of research data, there are indications that specific thinking abilities can be developed in school children at all ages if direction is definitively oriented towards such improvements.

Research on Pre-School Programs for the Disadvantaged.--A major premise of pre-school programs for the deprived is that intellectual ability can be enhanced through compensatory efforts and enrichment experiences. From a historical perspective, it has been only recently that human intelligence has come to be recognized as a changeable, alterable quality. Previously, intelligence was thought to be a permanent, fixed human characteristic, pre-determined at birth, and subsequently unaffected by environmental conditions experienced in later life. One of the early studies to question the immutability of intelligence was conducted by Klineberg in 1935. His study dealt with the differential intellectual abilities of the Northern and Southern Negro. He concluded that the superiority of the Northern Negro was not due to "selective migration" but to significant environmental factors.39 Recent work by such persons as Piaget, Bloom, Hunt, Deutsch, and others have been fundamental in establishing the widely held notion that human ability to a great extent is a social product; that intelligence is a malleable quantity which can be rather significantly influenced by various environmental factors and circumstances. Both group and individual abilities depend for their development upon the opportunities offered by the environment for varied experience, and for giving scope and meaning to this experience. It appears that intellectual abilities are susceptible to broad modifications and that inherited potentialities are shaped by the influences

of personal interaction and human culture. Bloom has stated that intelligence quotients may vary as much as twenty points as a result of the long-term overall effects of living in a culturally deprived environment.\(^4^0\) In discussing the essential nature of environment to the development and maintenance of intellectual activity, McCandless concluded that it seems likely that intelligence level may be a function of the amount of material available for learning and the type of learnings which occur.\(^4^1\)

Akin to the position that intelligence is a developmental ability is a second fundamental thesis regarding the formulation of pre-school experiences for disadvantaged children which asserts that the early years of a child's development are the most crucial with reference to intellectual growth; that the formative years of a child's life more directly influence and determine intellectual development than his later years. Bloom, in addressing himself to the importance of the first years of life, states that from birth to four years of age a child develops 50 per cent of his measured intelligence and that the other years through eighteen years of age account for the remaining growth of a individual's intellectual development.\(^4^2\)

Thus, the research findings and conclusions which support the idea that intelligence is an affectable and variable quality and which permit the hypothesis that environmental manipulation during the early years of a child's life can produce changes in intellectual development have provided the major


\(^4^1\) Boyd R. McCandless, "Environment and Intelligence," American Journal of Mental Deficiency, LVI (1952), 674-691.

\(^4^2\) Bloom, op. cit., 68.
propositions upon which pre-school programs for disadvantaged children have been formulated. Both positions are rather broadly agreed upon by authorities in the field and are documented by an impressive amount of scientific and empirical data. Putting it in similar terms, Goldberg states that the rationale for pre-school programs is based on the theory which asserts "that intelligence is developed through experience: that impoverished cognitive and language environment of the disadvantaged child prevents development of his full intellectual capacities and consequently retards his academic progress." Therefore, the corollary to the rationale for pre-school suggests that by providing compensatory educational experiences of an enriching nature, the potential for intellectual development among deprived children is enhanced, and the probability of subsequent achievement in learning is increased.

Fowler points out that "seemingly minimal cognitive stimulation in the pre-school years, when organized appropriately to the capabilities of the child, can be highly effective in accelerating the development of intellectual functions." Deutsch, responding to the value of planned pre-school experiences for the disadvantaged, states that "the possibility that conceptual learning sets, behavior patterns, and interest areas may be more favorably established" is greater at this stage of development than at other times during a child's growth.

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Pre-school compensatory educational programs for disadvantaged children have generated considerable support among those who feel that such programs provide at least a possible solution to some of the learning difficulties of the deprived. Likewise, the hypothesized effects which these experiences were to produce in the form of achievement results are being anticipated with equal enthusiasm by those who support such programs and by those who are skeptical of their value. Inquiries about the short term and long term influences of pre-school experiences are being made and tentative conclusions are being formulated. Research findings are now beginning to appear in the literature with some degree of consistency: much more is expected to follow. Research findings included in the study have been selected on the basis of their relevancy to the problem. The selective sampling of writings is not intended to represent the broad spectrum of literature regarding the disadvantaged child but to deal primarily with the effects of pre-school programs upon the deprived. Many of the studies cited in this section of the chapter are concerned more broadly with intellectual development and achievement than with the specific of concept development. The reasons for this are twofold: one reason is that only a limited amount of writing or research deals with the particular of concept development; the other is that because concept development is an integral part of intellectual development and intricately related to other psychological functions, research included from a broader context appears not only advisable but appropriate. The remaining portion of this chapter is given to presenting research studies which focus upon concept development and the more general area of achievement and intellectual growth.

To facilitate the presentation of research findings regarding the influences of pre-school programs upon the disadvantaged, the results of studies gained from reviewing the literature were classified according to
the short term and long term effects which had been determined by the major purpose of the investigators in the research cited. The "short term effects" classification refers to results of studies which had been determined at the conclusion of the pre-school program or in the first portion of kindergarten. The "long term effects" category refers to the results of research which had been ascertained during the latter part of kindergarten or in the primary grades of the elementary school. Each study is presented in a condensed form, giving the general format of the study and the findings as reported by the respective investigators.

SHORT TERM EFFECTS OF PRE-KINDERGARTEN PROGRAMS

1. Carl Bereiter and Siegfried Engleman utilizing a group of fifteen Negro children who were one and one-half years below an average language ability as determined by the Illinois Test on Psycholinguistic Abilities reported the following results: a) a gain of two years in language scores in seven months (ITPA), b) gains in IQ's from the lower 90's to slightly over 100's (Standard-Binet) in seven months, and c) scores at the second grade level on arithmetic and at the first grade level in reading (The Wide-Range Achievement Test).

Bereiter and Engleman utilized a highly structured, academically oriented program.46

2. Harry Miller reported gains in language from eighteen to twenty-one months after a six month interval of exposure to pre-school programs.

The research was conducted in day care centers in Boston and was based on matched experimental and control groups. The results were determined by the Gesell Developmental Evaluations test.47

3. Van Egmond et al, utilizing 104 pairs of matched Head Start and non-Head Start children, stated a) that both groups were "essentially similar" in responding to learning tasks initiated by teacher and interviewers, b) that non-Head Start children did "consistently but not significantly better" in responding to readiness tests, and c) that in the second and third week of kindergarten, Head Start children "were noticeably more active" in exploring, manipulating, and contacting room contents.48

The instrumentation employed in the study consisted of interviews and observations, readiness tests, and teacher ratings, respectively.

The finding that non-Head Start children did better in reading test scores is explained by improper matching of experimental and control groups according to the investigators.

4. Robert Hess et al, reporting the results of a comparative study using eighty-two Head Start children and eighty-two non-Head children matched according to socio-economic backgrounds, indicated that a) there were no significant differences between groups as determined by Pre-school Inventory Test, Nation Test on Reading Readiness, or Draw-a-Man IQ test; b) there were significant differences consistently favoring Head Start children on teacher ratings of progress and achievement.

The investigators further stated that "from the available information there was no evidence that Head Start prepares children better for reading

(Reading Readiness Test), or teaches them substantial amounts of information (Pre-school Inventory Test), or increases their intelligence (Draw-a-Man Test).\textsuperscript{49}

Significant differences between groups were determined by Teacher's Ratings regarding Head Start children's ability to adapt and adjust to kindergarten. These results and evaluations were obtained during the second month of kindergarten.

5. In Baltimore, Eisenberg and Conner studied the influence of a six-week pre-school enrichment program regarding selected aspects of cognitive development. The sample consisted of a Head Start groups and a non-Head Start group. Pre and post tests results were compared. The findings of the study concluded a) that pre-school experiences "produced significant gains in intellectual measures compared with the control group not participating in the enrichment program," and b) that pre-school enrichment programs "have demonstrated significant gains attributable to the Head Start experience by both the Peabody Picture Vocabulary Test and the Draw-a-Man Test."\textsuperscript{50}

6. M. E. Allerhand made a comparative study involving 125 Head Start children and 125 non-Head Start children in twenty-five Cleveland public schools. Pre and post tests were given to both groups on concept attainment.


\textsuperscript{50} Leon Eisenberg and C. Keith Conners, The Effects of Head Start on Developmental Processes (Baltimore, Maryland: School of Medicine, John Hopkins University, October, 1966) (mimeographed).
Results of the study reported that Head Start children responded favorably to formalized pre-school experiences. "In almost all instances, wherever there are indications of higher performance during kindergarten, the Head Start group continued to be out in front of the non-Head Start group. However, the impact as reflected by cross-sectional testing, demonstrates that as a group the Head Start children were not able to maintain the accelerated pace initiated during the summer program. A sub-group of about 25 per cent of the Head Start sample seemed to retain the positive impact and were consistently higher kindergarten performers." It is further reported that Head Start children showed a much greater variability in concept development. The results of the investigation were obtained the first few months of kindergarten.

7. Conners and Eisenberg studied the effects of teacher behavior on intellectual development of disadvantaged children at the pre-school level. The study included thirty-two teachers and 500 Head Start children. The results of the research showed that teachers who highly valued intellectual activity produced significantly more growth in IQ than teachers who emphasized socialization, play, and obedience; and that teachers who stressed the care of property and materials in the classroom produced significantly less growth in verbal intelligence.

Scores of children on the Peabody Picture Vocabulary Test showed direct increase with increasing amounts of intellectual activity by the teacher.

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52 C. Keith Conners and Leon Eisenberg, The Effects of Teacher Behavior on Verbal Intelligence in Operation Head Start Children (Baltimore, Maryland: School of Medicine, John Hopkins University, October, 1966) (mimeographed).
8. Foster studied the effects of pre-school experience by establishing structured environments, each emphasizing differentiated expectations. The high structured classroom represented a downward extension of the school and stressed language, concepts, and formalized learning. The low structured environment modeled an upward extension of the home and focused on self direction, play, and informalized activity and experience.

Results of the study showed that both groups made significant gains in IQ, in Children's Individual Test on Creativity (CITOC) scores and CITOC total performance scores. The high structured program group gained significantly more in CITOC total verbal scores.

Statistical significance was determined by pre and post test measures. There were no control groups.53

9. Horowitz and Rosenfeld, in a comparative study of middle class children and lower class youngsters with Head Start experience, found that although not statistically significant, children with Head Start showed increases in performance on the Peabody Picture Vocabulary Test. An additional finding of the study suggested that "attention to task-relevant cues among Head Start children may be temporarily deficient in the initial encounter with strange middle class teaching situations." The investigators also found that in performance on discrimination learning tasks under social reinforcement conditions Head Start boys equalled the performance of non-Head Start girls. This finding, according to the writers, tends to challenge the proposition that girls usually show faster academic development than boys.54

53Judilynn Theisen Foster, "Some Effects of Pre-School Experience on General Intelligence and Creativity of Culturally Disadvantaged Children" (unpublished Ph.D. dissertation, University of Southern California, 1966).

Certain of the literature concerning pre-school experiences for the disadvantaged child contained inferences, summarized comments, and statements regarding research efforts in this area. Many of these references were presented in the literature without including the specifics or details of the particular study from which the conclusions were drawn. Commentaries such as these, however, had relevance to the study and provided additional perspectives about pre-school education. For instance, Doherty assessed the effects of a ten-month pre-kindergarten on four-year-olds using both experimental and control groups and found significant differences for pre-kindergarten children in vocabulary and motor skill development.\textsuperscript{55} 

The Department of Child Psychology of John Hopkins University reported gains among Head Start children of thirty to forty points on the PPVT.\textsuperscript{56} Following Head Start experience, investigators of Staten Island Mental Health Society measured a gain of fourteen months in performance on a test designed to measure intellectual ability.\textsuperscript{57} In Clovis, California, disadvantaged children with Head Start experience showed a gain of four to twelve months on intelligence test performance.\textsuperscript{58} Brunner, in reporting observations made in the Baltimore public schools, stated that disadvantaged children showed a significant difference between tests in achievement before and after pre-school education.\textsuperscript{59}

\textsuperscript{56}Erwin Knoll, "Will Public Schools Control Head Start?" \textit{Nations Schools} LXXVII (June, 1966), 48.
\textsuperscript{57}\textit{Ibid.}
\textsuperscript{58}\textit{Ibid.}
\textsuperscript{59}\textit{Ibid.}
experience; that children scored better on readiness tests and had attained higher levels on achievement tests in the first grades. A report from Abilene, Texas indicated that children in a Head Start program had risen from the "poor risk" category to the "low-normal" category based on published norms for kindergarten pupils (Metropolitan Reading Test).

A study by Brazziell and Ferrell reflected the capability of disadvantaged children to prepare for academic learning. A group of twenty-six first graders were exposed to a six-week readiness program which included parent meetings, educational television, and readiness activities to develop vocabulary, perception, word reasoning, and the ability to follow directions.

At the end of six weeks, the experimental group showed significant gains compared with three non-experimental groups as determined by the Metropolitan Readiness Test.

The work of Harold Skeels with young feeble minded children pointed to the importance of stimulation and experience as factors related to intelligence and personal growth. He found that by providing enriching experiences, three-fourths of the children in his more recent studies had made a substantial increase in IQ scores and personal development.


pre-school programs had demonstrated the possibilities of changing motivation and achievement, developing abilities, improving language, and stimulating a substantial rise in IQ." Follow-up studies of children with kindergarten experience showed that gains are maintained when proper education is continued."63

LONG-TERM EFFECTS OF PRE-KINDERGARTEN PROGRAMS

1. Reports from the Perry Pre-school Project in Ypsilanti, Michigan concluded the one experimental group to have completed one year kindergarten demonstrated better ability than the control group on nearly all variables considered in the project, i.e., relationship with adults, achievement, motivation, and attendance. Significant gains in IQ scores between groups were noted at the end of the first year. After two years, the IQ differential between groups was not significant but two of the three experimental groups showed substantial gains over the control groups as determined by the Peabody Picture Vocabulary Test.64

2. Study I by Wolff and Stein regarding the effects of Head Start concluded that children who participated in the pre-school program showed no significant difference compared with classmates with no pre-school experience as measured by the Pre-school Inventory Test. However, Head Start children were ranked higher in readiness to enter first grade. Both evaluations were made after six months in kindergarten.

64 Harry Miller, op. cit., 126.
A follow-up effort, Study III, by the investigators regarding long-range effects of pre-schooling on reading achievement was conducted. The study utilized 101 children with pre-school experience and 3,378 children without pre-school participation in nine elementary schools in the New York City area. The investigation was made at the third grade level.

Results of the study showed a) that "a substantially greater proportion of Day Care Children (pre-school) scored at or above grade level than their classmates," and b) that children who had had pre-schooling evidenced a quantitative advantage over their grade mates.65

The Metropolitan Achievement Reading Test I: Third Grade was employed in the making the evaluation.

Members of the pre-school group were not randomly selected but were identified on a self selection basis because of their pre-school qualification.

3. Krider and Petsche studied the effects of an eight-week pre-school program on 197 pairs of children matched on race, sex, chronological age, intelligence, and occupation of parents. The measurements were taken at the end of kindergarten.

The findings of the study indicated no significant difference between the control group (without pre-school) and the experimental group (with preschool) in the three major variables of the investigation: intelligence, social adjustment, and achievement.66

65 Max Wolff and Annie Stein, Long-Range Effects of Pre-Schooling on Reading Achievement OEO Project 141-16, Study III (New York: Yeshiva University, 1966) (mimeographed).

66 Mary A. Krider and Mary Petsche, An Evaluation of Head Start Preschool Enrichment Programs as They Affect Intellectual Ability, the Social Adjustment, and the Achievement Levels of Five Year Old Children Enrolled in Lincoln, Nebraska Office of Economic Opportunity, Contract No. 543 (Lincoln, Nebraska: University of Nebraska, 1967) (mimeographed).
4. Chorost and Goldstein evaluated the influences of an eight-week summer Head Start program in three phases: end of pre-school program, end of kindergarten, and six months into the first grade.

A single group of sixty-one children were evaluated at the end of the eight-week pre-school session. These children showed significant initial gains in cognitive skills, perceptual-motor functioning skills, and school readiness skills.

Teacher ratings at the beginning of kindergarten indicated a superiority among Head Start children in language skills. At the end of kindergarten, report card grades evidenced no advantage of the pre-school group over their peers.

After six months in the first grade there was no significant difference between the sample group of twenty-two children with pre-school and the control group (determination unspecified) of thirty children without pre-school. Additionally, irrespective of Head Start, children from low socio-economic backgrounds were less successful than middle class children.67

5. Gray and Klaus were concerned with the long-term effects of pre-school programs for disadvantaged children. Their study utilized four groups of children with pre-school experience.

The conclusions of their study presented the following findings: a) the maximum effects of an intervention program were obtained prior to entrance into the formal school program; b) there was a general improvement in the first grade among experienced pre-school children in all areas except

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arithmetic, and c) a diffusion process occurred and the general achievement level of the class was increased, and as a result, the initial difference between pre-school and non-pre-school children decreased.  

6. Kirk studied the effects of nursery school experience on the intelligence of feeble-minded children between the ages of three and six years old. Matched control and experimental groups were utilized. Reports of the findings indicated that the overall effect of the nursery experience on retarded children was positive. The experimental group attained significant differences in intellectual growth as compared with the control group. Children retained the accelerated rates of growth established during the nursery school experience through the follow-up period of from three to five years later.  

The literature concerning pre-school programs for disadvantaged children contains observations from writers in this area of education which also reflect upon the long-term influences of pre-school compensatory programs. Individual studies by Deutsch and Weikart demonstrated that pre-kindergarten gains diminish when disadvantaged children enter the regular school system. Goldberg asserted that it appears that many of the cognitive gains made in the pre-school years tend to level off and even disappear after a year or two in the normal school situation.  


70 Miller, op. cit., 158.  

71 Goldberg, op. cit., 35.
Perhaps more optimistically, Deutsch reporting from the Institute of Development Studies, stated that skill deficiencies in cognition, perception, and language might be reversible if enrichment programs could be offered at the pre-school level which would allow children to more appropriately cope with subsequent academic problems in the elementary school.\footnote{72} Observers from the University of Texas reported that first grade teachers indicated that Head Start children were more proficient in learning, intellectual curiosity, and school adjustment than grade mates without pre-school adjustment pre-school opportunities.\footnote{73} Waller and Conners pointed out that advantages (degrees of IQ change) produced by Head Start experience were still in evidence nine months after their pre-school experience.\footnote{74}

Several other studies conducted in the early primary grades relate to the need for planned pre-school experiences and indicate learning difficulties encountered by disadvantaged children upon entering a formalized educational program.

Loper, in studying a disadvantaged first grade population found that deprived children appear to lack the necessary oral language tools to

\footnote{72} Martin Deutsch, "Facilitating Development in the Pre-School Child: Social and Psychological Perspectives," \it{Merrill Palmer Quality of Behavior and Development}, X (July, 1964), 250.

\footnote{73} Knoll, \it{op. cit.}, 48.

\footnote{74} D. A. Waller and C. K. Conner, \it{A Follow-up Study of Intelligence Changes in Children Who Participated in Project Head Start}, unpublished manuscript, The John Hopkins School of Medicine, 1966. Cited in C. K. Conners and D. A. Waller, \it{Beliefs, Attitudes, and Behavior of Teachers of Head Start Children} (Baltimore, Maryland: School of Medicine, John Hopkins University, October, 1966).
describe and organize their experiences.75 Related to this, Deutsch has found that disadvantaged children have inferior auditory and visual discriminatory abilities.

Johansen conducted a study to determine differences among three socio-economic groups with respect to their knowledge of picture objects representing pre-primer story content. The investigation utilized 300 first grade children, 100 in each of the sample groups: low, middle, and upper socio-economic status.

Conclusions drawn from children’s reaction to Picture Stimulus Response Cards (developed by Johansen) indicated that in all instances, significant differences favored children in the middle and upper socio-economic levels.76

The results of research studies regarding the initial influence of pre-school experience were, for nearly all aspects of a child’s development, generally consistent, and represented a consensus among investigators that noticeable or significant gains in performance were observable among children immediately following their participation in pre-school enrichment programs. Current research evidence offers strong support for the position that pre-school programs for disadvantaged children provide initial, positive contributions to a child’s social and psychological development.

The inconsistency between the findings from various researches appeared in studies which attempted to investigate long-term effects of pre-school


programs. It was at this point that discrepancies among results of studies became more evident and the divergency among opinions of researchers more obvious. The dissipation of agreement concerning the long-range influences of early compensatory programs seems partially explainable by the multivariate circumstances and factors which impinge upon this aspect of early childhood education. For instance, the varying nature of the disadvantaged pre-school child and his cultural learnings are extremely complex and present an area of study which, until recently, had been relatively unexplored. An eight-week or twenty-six-week enrichment program may not offer a sufficient amount of time to overcome the serious effects of deprivation and provide the deprived with the permanency of skills which can be retained over an extended period of time. The curriculum and administrative structure of the elementary school may not be sufficiently flexible to adapt to the orientation of pre-school programs or to take full advantage of the areas of growth demonstrated by pre-school youngsters. Differences in philosophies with reference to the purposes of pre-school programs for the disadvantaged create uncertainties regarding the appropriateness of materials, methods, and procedures incorporated into the educational program. Teachers at both the pre-kindergarten and early primary levels of instruction lack the essential background, orientation, and education to make them most effective in the classroom in promoting maximal intellectual growth in deprived children.

An important aspect of pre-school enrichment programs has been to extend certain educational components beyond the school and to establish a different type of relationship between the school, the home, and the neighborhood or community. Initial confusion and doubt in first organizing pre-school programs caused an apparent lack of sophisticated research method and design for studying longitudinal effects of early compensatory educational programs.
These, coupled with other factors, and the probable interaction among them offer some explanation for the differences and uncertainties among research findings regarding long-term effects of pre-school programs. The opportunities to stabilize many of these factors and to isolate various components of the problem for experimental research are increasingly present. Research results concerned with the longitudinal influences of pre-school programs will undoubtedly become more proliferate in the next several years and will provide the necessary data for resolving many of the currently pending questions.
CHAPTER III

METHODS AND PROCEDURES

LOCAL OF THE STUDY

The city of Columbus, Ohio, was selected as the locale of the study because it appeared to possess characteristics suitable for carrying out the basic intent of the investigator and because it had qualities which appeared to permit generalizing with reference to other cities and other pre-kindergarten programs. Columbus tends to be representative of population patterns of larger cities of the country, that is, having areas of development which reflect differing levels of social and economic stratification. The concentration of people of lower socio-economic status within a confined area of the city presents educational problems similar to those of other comparatively large urban areas, namely, those relating to the education of culturally disadvantaged children. Secondly, the pre-kindergarten program instituted in Columbus, especially designed to provide an extended experiential base for disadvantaged pre-schoolers, is similar to pre-kindergarten programs for the disadvantaged employed by other larger cities attempting to achieve like ends. The similarity of pre-school programs among larger cities exists primarily because they follow rather closely the guidelines and stipulations established by the central funding agencies (The Economic Opportunity Act and The Elementary and Secondary Education Act). The representative nature of Columbus with regard to its demography and its pre-kindergarten program for culturally disadvantaged children suggests, in a positive
manner, the advantage of generalizing findings and conclusions obtained from the study to other cities, populations, and pre-kindergarten programs having comparable characteristics.

Another reason for using the city of Columbus as the locale of the study was the receptive and cooperative attitude extended to the investigator and the proposed study by the officials of the Columbus public schools. The integrity with which preliminary conferences were conducted between school officials and the investigator indicated that information, records, and children would be accessible for purposes of the study. The reciprocal working relationship between the Columbus public schools and the Ohio State University contributed positively to the cooperation and support received by the writer in pursuance of the investigation.

THE POPULATION OF THE STUDY

In preliminary conferences with school officials it was noted that inner city schools were categorized according to a priority classification determined by the percentage of the school population coming from families receiving public financial assistance. Thus priority I schools had the highest incidence of welfare cases among its students; priority II schools had a lesser percentage of students from families on welfare, and so on through priority VI schools which had the least number of students from families receiving some type of public financial support. These priority ratings were used by the school officials to determine which children, according to an economic base, had the greatest need, and subsequently, which schools qualified for the greater share of federal funds and programs.
Priority schools with the lesser number of children on public welfare tended to be located on the periphery of the inner city area and to border on school districts and residential areas which were more advantaged. Priority schools with the higher incidence of welfare cases (priority I and priority II schools) tended to be represented more consistently in the core of the city. The concentration of priority I and priority II schools within a restricted geographical area of the city had important relevance with reference to population characteristics and to sample group equivalency measures which are discussed later.

To identify the population to be employed in the study, a form was sent to all first grade teachers in the forty inner city schools. On the form, teachers were requested to list the names of all children in their classes and to indicate, by marking the appropriate column, the type of educational experience each child had had prior to first grade. The form was designed by the investigator and was sent out through the central office with an accompanying letter from one of the school officials. The First Grade Class Roster form and the cover letter appear in Appendix A. The tabulated results of pre-first grade educational experiences as reported by first grade teachers in the forty inner city schools appears in Table 1.

Initially, the investigator had planned to utilize all the schools which had been identified as inner city schools as a basis for the population to be used in the study. However, it became apparent through analyzing the data obtained from first grade teachers and by becoming more familiar with the location of the schools that further consideration needed to be given to the identification of the study population. The decision to use only priority I and priority II schools was based on the following rationale.
### TABLE 1

**SUMMARY: EDUCATIONAL EXPERIENCES PRIOR TO FIRST GRADE**

<table>
<thead>
<tr>
<th>Priority Ranking</th>
<th>Number of Schools</th>
<th>Number of 1st Grade Classrooms</th>
<th>No Pre-K</th>
<th>No K</th>
<th>Pre-K but Not K</th>
<th>No Pre-K but K</th>
<th>8 weeks Pre-K and K</th>
<th>26 weeks Pre-K and K</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>7</td>
<td>31</td>
<td>70</td>
<td>7</td>
<td>444</td>
<td>103</td>
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<td>748</td>
</tr>
<tr>
<td>II</td>
<td>7</td>
<td>27</td>
<td>95</td>
<td>4</td>
<td>418</td>
<td>114</td>
<td>76</td>
<td></td>
<td>707</td>
</tr>
<tr>
<td>III</td>
<td>7</td>
<td>19</td>
<td>69</td>
<td>14</td>
<td>250</td>
<td>77</td>
<td>65</td>
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<td>475</td>
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<td>118</td>
<td>7</td>
<td>559</td>
<td>115</td>
<td>34</td>
<td></td>
<td>833</td>
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<tr>
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<td>9</td>
<td>31</td>
<td>0</td>
<td>110</td>
<td>20</td>
<td>12</td>
<td></td>
<td>173</td>
</tr>
<tr>
<td>VI</td>
<td>2</td>
<td>8</td>
<td>16</td>
<td>2</td>
<td>168</td>
<td>25</td>
<td>2</td>
<td></td>
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<td><strong>124</strong></td>
<td><strong>399</strong></td>
<td><strong>34</strong></td>
<td><strong>1949</strong></td>
<td><strong>454</strong></td>
<td><strong>313</strong></td>
<td></td>
<td><strong>3149</strong></td>
</tr>
</tbody>
</table>

a. Statistics were not available on family income. Because of this, the assumption was made that the greater the incidence of welfare cases among school student bodies, the greater the economic homogeneity among the children used in the sample group. The reversal of this is also part of the assumption: that the lesser the incidence of children on public assistance the lesser the commonality and the greater the disparity among inner city schools and their student bodies with respect to equivalent economic levels.
b. Schools with lower priority ratings tended to be located near the outer city and to have proportionately fewer disadvantaged children. It was assumed, therefore, that the lesser the concentration of disadvantaged children among the school population the lesser the degree of homogeneity among first grade children with respect to a low income factor. Within these circumstances, it was further assumed, that there was a greater probability that influences of pre-school programs would not be distinguishable or observable in these schools because of the limited number of disadvantaged children within the first grade membership.

c. Schools with high priority ratings tended to be concentrated in the center of the city. The assumption regarding this condition was that the greater the concentration of poverty in a given area the greater the economic equivalency among children living in a deprived environment, and consequently, the greater the socio-economic homogeneity among first graders attending schools in such an area.

d. Schools identified by the school administration as inner city or priority schools were spread over a comparatively large geographical area of the city. Therefore, it was assumed that the greater the geographical distribution among target area schools, the greater the probability that significant differences were present and operant in regard to relevant factors such as population characteristics, intensity of deprived conditions, teacher awareness of and attitude towards disadvantaged children, and kinds of compensatory programs present in respective inner city schools.

e. Inner city schools with different priority standings qualified for different kinds of facilities, personnel, and educational programs. This was particularly evident in the primary grades; thus there were
notable differences in educational offerings and opportunities at the first grade level among inner city schools. With reference to this set of factors, it was assumed that the greater the need for compensatory programs as determined by the proportionate number of children from welfare families, the greater the similarity of first grade programs with respect to facilities, personnel, and curricular content.

In addition to representing the conditions and characteristics expressed in the above criteria, the fourteen priority I and priority II schools had a parameter of numerical representation concerning the children, educational background, and schools contained within the disadvantaged area of the city. Using the total number of disadvantaged children in the inner city schools of Columbus as a base, the selected schools and their first grade population represented:

a. 41.35 per cent of all children who had no pre-kindergarten or kindergarten experience

b. 42.22 per cent of all children who had kindergarten but no pre-kindergarten program

c. 41.79 per cent of all children who participated in the eight-week pre-kindergarten program

d. 63.89 per cent of all children who participated in the twenty-six-week pre-kindergarten program

e. 46.20 per cent of all children in attendance in the first grade in the inner city schools of Columbus

f. 47.58 per cent of all first grade classes containing disadvantaged children with pre-kindergarten experience

The ex post facto nature of the design used in the study necessitated provisions for controlling and accounting for the greatest number of variables possible. Therefore, the population used in the study was made
up of disadvantaged children whose qualifications were consistent with the following criteria:

a. **Age.**—Children who were born during the time interval from November 1, 1960 to October 31, 1961.

b. **Grade Placement.**—Children who were enrolled in the first grade in the Columbus public schools for the 1967-1968 school year.

c. **Kindergarten Experience.**—Children who had had a full year of kindergarten experience.

d. **Schools in Attendance.**—Children who were in attendance in one of the fourteen elementary schools denoted as priority I and priority II according to an index of poverty determined by the incidence of welfare cases among respective student bodies.

e. **Incidence of Poverty.**—Children who came from families residing in school districts which were represented by the fourteen priority I and priority II schools and which were characterized by the greatest frequency of welfare cases per school among the forty inner city schools. This criterion was based on the assumption that the higher the incidence of families on public financial assistance, the greater the economic homogeneity and commonality among children in attendance in a particular school.

f. **Environment.**—Children who lived within the geographic area represented by the school districts of the priority I and priority II schools. The defined environment represented an intact area of the city in which there was a high concentration of low income families. School districts of priority I and II schools were tangential and formed a solidified geographical area within the center of the city.

These criteria for identifying the population were established to minimize certain effects of ex post fact designs which placed, in question, the credibility of pre-treatment qualities of sample groups. Factors incorporated in the criteria for delimiting the population had been selected

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Data used to establish this criterion was taken from a report, "Target Areas for Community Action Against Poverty" prepared by The United Community Council of Columbus and Franklin County. The report was prepared by The Research Services of The United Community Council. Statistics of population, age distribution, environs, unemployment, education, dependency, housing, health, and crime and delinquency were utilized in the compilation of the report.
a) because they were characteristics of qualities which appeared to be relevant to the abilities of children in attaining different levels of concept development and mental operations, and b) because they were characteristics of qualities which could be accommodated in the design of the study; thereby offering greater probability of control over selected sources of variance. The utilization of population criteria made possible certain assumptions with reference to the homogeneity and equivalency among sample groups which in turn permitted the generalization of certain population characteristics.

Data concerning other sources of variance such as family income, educational achievement level of the parents, parent or child motivation, intelligence, or teacher effectiveness were not available. The ex post facto conditions of the study made it impractical, if not impossible, to take in account all possible sources of variance. By observing the criteria established for defining the population of the study and by applying random selection in establishing sample groups, the assumption was made that uncontrolled sources of variance would tend to be normally distributed among sample groups and would tend to cancel out their respective influences.

Wolff and Stein\(^2\) conducted a study of six Head Start centers in New York City to investigate factors influencing the recruitment of children into Head Start programs. The study, implemented by matching 244 families on relevant factors, showed:

\(^a\) that home environments of his Head Start children and non-Head Start children did not differ in any substantive way.

\(^2\)Max Wolff and Annie Stein, "Factors Influencing the Recruitment of Children into the Head Start Program, Summer, 1965" This study was supported by funds from the Office of Economic Opportunity and sponsored by the Fer Kauf School of Education, Yeshiva University. (mimeographed).
b) that basic social and economic conditions between the two
groups of families offered striking similarities.

c) that parents of non-Head Start children had higher educational
background and attainment.

d) that both groups had high educational aspirations for their
children.

The findings of this study suggest that children coming from similar
kinds of deprived backgrounds are similarly affected by paralleling social,
economic, and family influences. The conclusions of Wolff and Stein's
study give credence to the assumption made in this investigation which
indicate that sample groups used are basically equivalent and homogeneous.

Conditions established prior to the study and determined by the ex-
posure of a number of disadvantaged children to pre-kindergarten experi-
ence produced stratification in the population which corresponded to the
level of treatment received. The population consisted of disadvantaged
first grade children with varying degrees of pre-first grade educational
experiences and were noted as follows:

a) children with no pre-kindergarten but with kindergarten experience

b) children with eight weeks of pre-kindergarten and kindergarten

c) children with twenty-six weeks of pre-kindergarten and kindergarten.

A possible fourth stratum, children with pre-kindergarten (eight and
twenty-six weeks) and no kindergarten experience was not included in the
study population because of a lack of sufficient numerical representation
within the classification (See Table 1). A sample group with these quali-
ties would have been useful in the study for providing some measure of
kindergarten influences on concept development and mental operations.

Children in the population grouping who had neither pre-kindergarten
or kindergarten were not included in the study. The void of pre-first
grade experience made their educational conditions irrelevant to the purposes of the study.

SAMPLE

Sample groups utilized in the study were selected by the process of randomization from the previously described stratified population. Members of each of the respective population classifications (levels of pre-kindergarten experience) were assigned a number beginning with one and continuing consecutively through all the sample members in each of the categories. Subsequent to this, sample members were selected by means of a table of random numbers.3

Three sample groups were drawn from the population of disadvantaged, first grade children: Sample Group I being the control group and Sample Groups II and III being the experimental or treatment groups. Specifically, the sample groups were as follows:

Sample Group I Fifty children: twenty-five females and twenty-five males. Pre-first grade experience: no pre-kindergarten but one full year of kindergarten.

Sample Group II Fifty children: twenty-five females and twenty-five males. Pre-first grade experience: eight weeks pre-kindergarten and one fully year of kindergarten.


Random selection was employed in the establishment of sample groups to control sources of variance which were not provided for in the criteria.

defining the population. The sex factor was built into the design of the study a) to control it as a possible source of variance and b) to analyze its influence with reference to concept development and mental operations.

Certain sample group characteristics became available as the result of data collection. These factors, presented in the following table, reflect qualities of the sample groups. These are presented to support previously stated assumptions referring to the equivalency of certain characteristics among the stratification levels of the population and subsequently applied to the sample groups employed in the study. According to the writers of professional literature, each of these factors appears to have a direct relationship to intellectual development and utilization.

TABLE 2

SAMPLE GROUP CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
<th>Average for All Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Pre-K but K</td>
<td>8 wks. Pre-K and K</td>
<td>26 wks. Pre-K and K</td>
<td></td>
</tr>
<tr>
<td>No. of Parents Per Child</td>
<td>1.60</td>
<td>1.56</td>
<td>1.60</td>
<td>1.58</td>
</tr>
<tr>
<td>No. of Siblings Per Family</td>
<td>4.02</td>
<td>4.03</td>
<td>3.52</td>
<td>3.85</td>
</tr>
<tr>
<td>Chronological Age of Child</td>
<td>6 yrs. 5 mos.</td>
<td>6 yrs. 4 mos.</td>
<td>6 yrs. 4 mos.</td>
<td>6 yrs. 4.5 mos.</td>
</tr>
<tr>
<td>Ethnic Background White</td>
<td>20%</td>
<td>8%</td>
<td>18%</td>
<td>12.85%</td>
</tr>
<tr>
<td>Non-White</td>
<td>80%</td>
<td>92%</td>
<td>72%</td>
<td>87.14%</td>
</tr>
</tbody>
</table>
Information regarding the number of parents per child and the chronological age of each sample member were taken from current school records. The number of siblings per family was ascertained during a personal interview with each child in the sample groups during data collection. It is to be noted that the data pertaining to family size may lack complete accuracy. To gain this information, each child was asked the number of brothers and sisters in his family. Most children knew the information and stated it without hesitation; some sample members with larger or extended families, did not know that exact number of family members or showed signs of uncertainty. Efforts were made by the interviewers to verify questionable family membership with the principal and school secretary.

DESIGN OF THE STUDY

The general research design employed in the study was of an ex post facto nature, indicating that treatment had been given to the experimental sample group prior to the initiation of the study. The treatment, occurring during the time interval from February to September of 1966, was completed approximately eighteen months before the time of data collection.

The dependent or treatment variable was defined as the pre-kindergarten program especially designed and implemented for disadvantaged children in the fourteen elementary schools comprising the population identified in the study. The investigator had no control over the levels of treatment or the selecting or assigning children to the experimental or control groups. The children, on the basis of self selection, were placed in various classifications depending upon the kinds of formal educational experiences they had had prior to first grade. As stated
earlier in the section describing the population of the study, first grade children were categorized according to three levels of treatment or experience. One level denoted that treatment of the control group had been withheld; another level signified that treatment had been applied for an eight-week period to one of the experimental groups, and the other level indicated that treatment had been applied for a twenty-six-week period to a second experimental group. The varying levels of treatment to which first graders were exposed produced categories of stratification in the population and a parallel differentiation among sample groups.

Sample groups, selected at random from the stratified population, were categorized and characterized according to treatment levels:

Sample Group I  Fifty first grade children with no pre-kindergarten but with kindergarten experience—twenty-five boys and twenty-five girls.

Sample Group II Fifty first grade children with eight weeks pre-kindergarten and kindergarten experience—twenty-five boys and twenty-five girls.

Sample Group III Fifty first grade children with twenty-six weeks pre-kindergarten and kindergarten experience—twenty-five boys and twenty-five girls.

The major dependent variable in the study was identified as the cognitive structure of selected social studies concepts held by disadvantaged, first grade children. Ascertaining the level of concept development among groups with differing degrees of pre-kindergarten experience was the major purpose of the study: Do specifically designed pre-kindergarten programs significantly influence concept development at the first grade level?

The second dependent variable of import to the study was that of mental operations. This variable, representing certain thought processes, was directly relevant to concept development. The investigation of
selected thinking functions sought to provide data concerning another fundamental intent of the study: Do specifically designed pre-kindergarten programs significantly influence the utilization of mental operations of disadvantaged children at the first grade level?

Ex post facto studies characteristicly do not permit control or manipulation of treatment variables or the random selection and assignment of individuals to experimental and control groups. Because of the importance of this limitation, considerable attention was given by the investigator to this particular design characteristic. The following provisions were made in the study to establish internal and external validity relative to the design used in the investigation.

A. Criteria for the identification of the population defined in the study provided measures of equivalency regarding the following factors:

1. Chronological age
2. Schools in attendance
3. Grade placement
4. Solidified environment
5. Incidence of poverty
6. Interim educational experiences

B. The particular design used in the study made provisions to accommodate the following factors:

1. Sex
2. Levels of treatment
3. A control group

C. Random selection was employed to establish some degree of normal distribution with respect to the following factors:

1. Teacher effectiveness
2. Parent and/or child attitudes toward school
3. Motivation of the child

D. Information gained from interviewing members of sample groups
provided data for comparability among sample groups. These data included:

1. Number of parents per family
2. Number of siblings per family
3. Ethnic or cultural background of children
4. Average age of children in sample groups

Researchers utilizing ex post facto studies are able to view a problem only in retrospect, attempting to measure changes or to establish cause and effect relationships without the value of a control group. This study offered the advantage of a control group, not in the strict sense of the term, as would defined in experimental research, but in a more general way such as in field research where conditions and circumstances may not be as conveniently or closely controlled. As previously indicated, considerable attention and effort had been given to establishing factors of homogeneity among sample groups. The degree to which this was achieved will determine the degree to which generalizations formulated in the study can be applied. The investigator is of the opinion that the utilization of a control group and the employment of specific population criteria definitely increases the probability of achieving generalizable statements.

Figure 1 serves to illustrate the design employed in the investigation. It shows the three sample groups, each composed of fifty members and constituted by equal numbers of boys and girls. It presents, also, the major classifications of topical areas and mental operations which represented the areas of knowledge and mental processes central to the purposes of the study. Scores obtained for each of the sub-categories provided the data for analyses and ultimately for findings reported in the study.
FIGURE 1

DESIGN OF THE STUDY

<table>
<thead>
<tr>
<th>Sample Group I</th>
<th>Sample Group II</th>
<th>Sample Group III</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Pre-K but K</td>
<td>8 wk Pre-K &amp; K</td>
<td>26 wk Pre-K &amp; K</td>
</tr>
<tr>
<td>Males 25</td>
<td>Males 25</td>
<td>Males 25</td>
</tr>
<tr>
<td>Females 25</td>
<td>Females 25</td>
<td>Females 25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Topical Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
</tr>
<tr>
<td>Neighborhood</td>
</tr>
<tr>
<td>Community</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mental Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification</td>
</tr>
<tr>
<td>Association</td>
</tr>
<tr>
<td>Classification</td>
</tr>
</tbody>
</table>

INSTRUMENTATION

Development of the Instrument.--The instrument used for the study was developed by the investigator. The revised form of the instrument consisted of a series of seventy-two pictures illustrative of selected representative social studies concepts and a set of questions corresponding to and correlated with the picture series. A sample page of the picture series and a total listing of test questions appear in Appendixes D and E. The test was designed to yield two sets of scores, each set representing a major aspect of the study: topical areas in the social studies and mental operations characteristic of selected thought processes. The utilization of a differentiated means of totaling individual responses to the 105 test questions
produced two independent scores, each depicting the same total score but reflecting a different component emphasis. The topical areas component of the test included the broad classifications of home, neighborhood, and community. The mental operation component encompassed the mental process skills of identification, association, and classification.

The test instrument was composed of two separate physical parts: a booklet of pictures utilized by the child and a series of questions used by the interviewer. Each page of the picture booklet contained six pictures representing, on a particular page, one of the three topical areas. Pictorial representations were used in the test instrument because of their appropriateness to certain limitations of young children, especially disadvantaged youngsters, with reference to verbal understanding, verbal fluency, and reading comprehension. Russell has indicated that young children may have concepts they are unable to verbalize.4 Heidbreder (1934), cited in Russell, found that children could recognize concepts in various test instruments without being able to adequately describe them in speech.5 Pictures provide a semi-concreteness of experience, something which can be seen and touched, something which can stimulate responses where printed or spoken words may not. Picture utilization is supported by certain principles of child growth and development which stress the realness of things for young children as opposed to the abstractness of things.

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Responses of a child to test questions required neither a written or oral response, rather it required the child to "point to" or "touch" the picture or pictures in the booklet as determined by the test question asked by the interviewer. This non-verbal, non-written response technique was used for several reasons: it recognized the limited ability of disadvantaged children in the area of language and communication skills, it utilized large muscle skills which allowed some freedom of movement by the child, and it required less time per response which permitted each child to respond to a greater number of questions.

The source of pictures used in the instrument was magazines, periodicals, newspapers, books, and other publications providing useful and relevant illustrations. Pictures chosen to be incorporated in the test were selected primarily on the basis that they represented, as nearly as possible, the social studies concepts which were judged by teachers to be appropriate to first grade and pre-kindergarten programs as determined by the Professional Judgment Questionnaire. This criterion was employed as a means of validating the content of the test instrument. Size, shape, and distinguishable characteristics were also used as criteria for picture selection. Color was not considered as a factor in picture selection in this particular instance because the reproduction process used to make copies of the test picture booklet produced only black and white prints. The fact that six pictures were placed on each page of the picture booklet limited picture selection with reference to size and dimension of the illustrations.

The test was divided into three sections, each section representative of the topical areas of home, neighborhood, and community. These topical areas represented content materials determined by pre-kindergarten and first grade teachers to be appropriate to the respective levels of instruction.
Pictures and questions incorporated into the test instrument were selected and developed to represent these social studies categories.

In addition to structuring the test around topical areas, specific attention was given to developing test items which would measure a child's ability to utilize certain mental operations. Thus, each test item was designed to provide data on topical areas and mental operations. Thirty-five items were developed for each of the mental operations utilized in the study. An example of the test picture booklet format appears in Appendix D. The test instrument is found in Appendix E.

Professional Judgment Questionnaire.—A Professional Judgment Questionnaire was developed for the study to determine the amount of instructional time pre-kindergarten and first grade teachers allotted to selected social studies content. Information derived from the questionnaire was utilized as the basic source for identifying and validating content materials used in the construction of the test instrument. An example of the Professional Judgment Questionnaire and the letters which accompanied it appear in the Appendix B.

Statements of philosophy, statements of objectives, daily programs, curriculum guides, textbooks, and other curricular materials relevant to the instructional programs of pre-kindergarten and first grade served as primary sources for developing the Professional Judgment Questionnaire. The content of the questionnaire was represented by five general categories: family, home, neighborhood, school, and broadened environment.

Professional Judgment Questionnaires were sent to a selected number of pre-kindergarten and first grade teachers. The questionnaire requested teachers of each grade level to indicate on a five point "Appropriateness Scale" the amount of instructional time given to the respective items and categories as defined in the questionnaire. The scale, representing a
continuum, contained five value categories: Not Appropriate, Somewhat Appropriate, Appropriate, Very Appropriate and Highly Appropriate.

Questionnaires were sent to fifty-six first grade teachers who were selected on the basis that 20 per cent of their class was composed of disadvantaged children who had attended pre-kindergarten classes. Disadvantaged children who had attended pre-kindergarten classes for a lesser amount of time than the full specified term were not considered in establishing the 20 per cent criterion. From the fifty-six questionnaires which were sent to first grade teachers, thirty-one were marked and returned. This represented a 55.35 per cent return of questionnaires from first grade teachers.

Professional Judgment Questionnaires were also sent to forty-four pre-kindergarten teachers who occupied instructional positions during the time interval from February to August of 1966 in one of forty-seven pre-kindergarten centers. Of the forty-four pre-kindergarten teachers, seventeen were presently (1967-1968) teaching in pre-kindergarten centers in Columbus, twenty-seven had assumed other teaching responsibilities and were no longer directly connected with the pre-kindergarten program. All teachers in the 1966 pre-kindergarten program were certificated elementary school teachers.

From the forty-four questionnaires sent to pre-kindergarten teachers, twenty-one were marked and returned. This represents a 47.72 per cent return.

Responses indicated on the returned questionnaires were compiled and an appropriateness rating was established for each major objective and its sub-categories. The appropriateness rating was determined by tallying teachers' responses for each questionnaire item on a five point scale and
calculating a weighted average. The weighted average for each questionnaire item provided a means for comparing and analyzing the social studies content of pre-kindergarten and first grade instructional programs. The primary function of the appropriateness rating was to permit teachers to identify social studies materials which were appropriate to their grade level of instruction and to which a definable amount of instructional time was or would be apportioned.

The questionnaire provided space under each category for teacher's response or reaction to a particular category. This technique proved to be of considerable value for many teachers made specific comments and recommendations regarding items and the instructional program which were later incorporated into the test instrument.

An appropriateness rating of 3.25 was established as the criterion for accepting questionnaire items which were ultimately incorporated into the test or measurement instrument used in the study.

Questionnaire items with an appropriateness rating of less than 3.24 were eliminated from inclusion in the test instrument on the assumption that the lesser the appropriateness rating of items selected for the measurement instrument, the lesser the probability that such items correlated directly with the instructional intent of the learning environment. Likewise, questionnaire items with a rating of 3.25 or greater were selected for incorporation into the test instrument because of the greater probability of their more directly correlating with the learning objectives of both grade levels. That is to say, that questionnaire items had to have an appropriateness rating of 3.25 or greater at both pre-kindergarten and first grade levels of instruction to be considered as a possible test item.
The utilization of an appropriateness scale for questionnaire items provided a basis for determining the content focus of instructional time at pre-kindergarten and first grade levels and permitted the identification of concepts and topical areas of the social studies. This limited the scope of the study to content which was highly relevant to both grade levels of instruction. In addition to providing a means for validating content of the instrument, the results of the questionnaires provided a basis for an assumption by the investigator with reference to possible determined differences among sample groups. It was assumed that if differences among sample groups did exist, these differences should be most evident in areas which had been specifically planned for in the instructional program.

Tabulations of teacher responses to the questionnaire indicated consistent agreement with respect to the appropriateness of content for each particular level of instruction. It was interesting to note that there were no dichotomous positions taken by teachers with reference to any questionnaire item at either grade level. Each group of teachers represented a concensus regarding the instructional emphases of questionnaire items for their respective teaching responsibilities. Agreement of this type appears to lend credibility and validity to the items incorporated into the test instrument.

Testing of Instrument.—The first draft of the test instrument included seventy-two pictures and 135 test items. The instrument was tested with a sample group of twenty-four children (twelve girls and twelve boys) who were selected randomly from six first grade classrooms in two priority III elementary schools. In this specific instance, only two sample groups were used, each representing a polar position with reference to pre-school experience: one sample group with no pre-kindergarten experience, the
with no pre-kindergarten experience, the other with twenty-six weeks of pre-kindergarten experience.

Priority III schools were used in the preliminary testing procedures because they possessed qualities similar to the priority I and priority II schools which were used in the main part of the study. The sample group used in testing the instrument met essentially the same criteria established to define the population used in the major part of the study. Differences between the trial population and the study population were generally observed a) in a different schools in attendance, b) in a slightly lesser incidence of welfare cases among the student bodies, and c) in a greater distance, geographically, from the center of the city. Other population criteria factors between the populations appeared to be equivalent.

The basic purpose of the preliminary testing was that the study instrument was to provide data which would be useful in refining the test, thereby improving its effectiveness and reliability. As a result of testing the first draft of the test instrument, revisions were made in test instructions, interview techniques, test pictures, and test items.

The revised form of the test instrument included a) test instructions, b) a test picture booklet, c) a list of test items, and d) individual response sheets. A sample of each of these components of the revised test may be found in Appendixes C, D, E, and F respectively.

Administration of the Test Instrument.--The test was administered to the sample groups of the study during the third and fourth week of March, 1968. This represented a lapse of time of approximately eighteen months after pre-kindergarten experience was completed by children in sample groups II and III. The influence of the interval of time upon the final
results of the study may be considered from at least two perspectives. The extended time between the completion of pre-kindergarten and the administration of the test may be viewed as a limitation to the study because it offers the possibility of factors, other than the pre-kindergarten experience, contaminating or influencing the results of the study, and because it places certain restrictions upon the interpretation of the study results. On the other hand, it may be considered as an advantage to the investigation because it permitted a sampling of the influences of pre-school programs upon concept development on more of a longitudinal basis.

The test was administered by four persons, the investigator and three college seniors majoring in elementary education. Prior to the administering of the test, an orientation was held for the three persons assisting in data collection. During this training session, the general format and purpose of the study was reviewed, test directions and instructions were thoroughly discussed, and tapes made by the investigator during the pre-testing of the instrument were listened to and analyzed. Each assistant was given the appropriate materials for administering the test and a list of students in each of the respective schools assigned to her. On the first day of data collection, the investigator personally contacted each of the assistants to attend to questions or problems which had occurred. Reports from each assistant were positive. All minor problems were resolved.

Two weeks prior to data collection, the investigator visited each building being used in the study and conferred with the school principal. The purpose of the visit was to confirm the nature of the study and to make arrangements for a room apart from the classroom where the test could
be administered in private. A week preceding the collection of data, and as a result of a conference with the school official in charge of special programs, a letter was sent from the central office to each school principal indicating the time for data collection and requesting full cooperation from the principal and his staff.

The test was administered to each student by means of a personal interview approximately twenty minutes in length. Students being interviewed were in no way identified either by the type of pre-school experience they had had or by the sample groups they represented. The non-identification technique was utilized to minimize biases which may have occurred as a result of interviewers knowing the particular classification of a child. By not knowing in which sample group a child was included or the extent of his pre-school experience, the test administrator was not influenced by any preconceived expectations of performance and would, therefore, more reliably conduct the interview.

Each interviewer was instructed to go to the classroom to get the child to be interviewed. This technique aided in establishing a positive atmosphere within the classroom and a receptiveness among the children in the class. The interviewer or the teacher announced to the class that she, the interviewer, would be "talking about some pictures" or "playing a picture game" with several of the children in the class. Walking from the classroom to the room where the test was administered provided an opportunity for the interviewer to become acquainted with the child. This helped to establish a rapport between the evaluator and the evaluatee.

Preliminary to the administration of the test, the evaluator was directed to solicit from each child the number of brothers and sisters in his family. Cases in which families were extremely large or in which the child
expressed doubt, confirmation of family size was pursued through the principal and school secretary. Although there were no completely accurate means of determining the number of siblings in a family, the investigator felt that these data were a close approximation to the actual family membership. Interviewers were also instructed to indicate on the child's individual response sheet his cultural or ethnic origin (white/non-white). This data was utilized only to establish sample group characteristics and equivalency and not as a determinant of learning capacity. The great majority of children interviewed were spontaneous in their responses and reflected little or no reluctance in their replies.

The formal component (test) of the interview was closely structured. Written directions for introducing and administering the test were closely followed to give consistency to procedures used in the interview and to add reliability to test items and children's responses. By controlling conditions under which measurements were taken, theoretically, error variance was reduced.

Test items were read orally to each child by the interviewer. To respond to the question, it was necessary for the child to "point to" the picture or pictures which most adequately answered the questions. The interviewer recorded on an individual response sheet the number of each picture to which the child pointed. The number of correct responses made by the child constituted his total test score.

General reactions of children to the interview and the test instrument were positive. A sampling of children were asked if they enjoyed participating in the interview. Replies such as "it was fun," "I like looking at pictures," or "Can I do it again?" were common. It was reported by the interviewers, and observed by the writer, that following the interviewing
of two or three children in a class, the interviewer was greeted by spontaneous remarks from children such as "Can I go next?" "Take me," and "I want to go." This type of class response tended to suggest that earlier interviews with a small number of the children were favorably accepted.

Schools in which children from the sample groups were absent were recontacted regarding the child's presence and revisited. Children who were absent through the eight days of data collection were replaced by an alternate from the respective sample group. This procedure is explained in the following section dealing with the replacement of members in sample groups.

Principals, teachers, and school secretaries were extremely cooperative and helpful in facilitating data collection.

Replacement of Sample Group Members.—Provisions were made for the replacement of children from the selected sample groups who were absent during the interval of time designated for data collection or who had withdrawn from the schools which were used in the study. As stated earlier, sample groups were selected at random from the population defined in the investigation. In establishing sample groups, fourteen (seven females and seven males) additional children were randomly selected for each of the three sample groups and assigned a ranking of first alternate, second alternate, etc. As the need arose, alternates were placed in their respective sample groups according to their rank standing.

In addition to replacing children who were absent or had withdrawn, three children from the sample groups were replaced because of certain mental deficiencies as diagnosed by a school psychologist and a physician.

Utilization of replacement alternates in the sample groups was
necessary for eighteen children. The distribution and percent of representation of replacement alternates is shown below.

**TABLE 3**

REPLACEMENT AMONG SAMPLE GROUPS

<table>
<thead>
<tr>
<th></th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Replacements</td>
<td>2</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Percent of Representation</td>
<td>11.1%</td>
<td>44.4%</td>
<td>44.4%</td>
</tr>
</tbody>
</table>

Scoring Individual Response Sheets.—Different means of scoring test items were considered due to the fact that certain of the test questions required more than a single response and were thought to represent different degrees of difficulty. Weighting more difficult questions was considered at one point in the formulative stage of the study. However, the general nature of the test and the fact that weighting of test items does not usually increase the effectiveness of the item or the instrument, it was decided that all test items would be scored on an equal-weight basis, i.e., on the assumption that each question had an equal value. This was fixed at one point per test item.

Test items designed to measure the mental operations of identification and association, as previously defined, required only a single

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response. These questions, each having a value of one point, were scored on a right or wrong basis and were assigned the value of one or zero according to the correctness or incorrectness of the response. Test items used to sample the mental operation, classification, required multiple responses from the child. In this specific instance, although each item had a standard value of one point, fractional credit was given in cases where children responded with only a partial answer. Nearly all test items measuring mental operations of a classificational nature required two, three, or four responses. By utilizing a common denominator (twelfths) each child received credit for that fractional part of the whole which was correct. Therefore, a child in answering questions necessitating multiple responses received full one-half, one-third, one-fourth, or no credit for a particular question depending on the degree of correctness of his answer. The rationale for allotting partial credit for questions requiring multiple responses was that a partial answer, if correct, indicated a direction or inclination of thought, and source of knowledge. The thought processes or the fund of knowledge which a child possesses if accurate, although incomplete or immature, contributes to his behavior.

This study was fundamentally interested in two selected components of behavior: concept development and mental operations. It, therefore, appeared justifiable to give credit for that amount of knowledge or process skill which a child had at his disposal.

Supporting the rationale for giving partial credit was the writer's contention that questions in the test which required several responses were more difficult for children than questions which needed only one response. The differences in levels of difficulty among questions regarding mental operations were observed by the interviewers during data
collection and even more acutely by the investigator in scoring them.

As previously stated, children's responses to test questions were recorded by the interviewer on Individual Response Sheets. To expedite grading, a child's response to a test question was placed in a column adjacent to another column which contained correct response answers. To grade the test, it was only necessary to compare the two adjacent columns, note the credit for each test item, and record this credit in a third column provided for this purpose on the Individual Response Sheet.

A set of sub-scores for each of the three topical areas was obtained by adding up that portion of the credit column which represented each of the topical areas. This produced a set of sub-scores which denoted topical areas and a total test score which represented concept development.

Sub-scores for each of the three mental operations were obtained by using an overlay scoring sheet and by classifying the 105 test items according to mental operation categories rather than by topical area classifications.

The same set of test items was used to obtain two independent sets of sub-scores. The total test score remained unaltered.
CHAPTER IV

RESULTS OF THE STUDY

The purpose of the writer in conducting this study was to investigate longitudinal influences of planned pre-school experiences upon children who had been designated as being culturally disadvantaged. The major focus of the study was upon concept development among deprived children with respect to selected social studies concepts. A second area of concern in the study was that of mental operations, i.e., the psychological functions utilized in the process of concept development as well as in certain thought processes.

The sample groups used in the study were chosen from among all first grade children in attendance at the first grade level in fourteen inner city schools in Columbus, Ohio. One hundred fifty children were selected randomly from the stratified population of first graders as follows: fifty children with no pre-kindergarten experience composed sample Group I, fifty children with eight weeks of pre-kindergarten experience made up sample Group II, and fifty children with twenty-six weeks of pre-kindergarten experience constituted sample Group III. Each group included an equal number of boys and girls.

The instrument used in the study was developed by the investigator and consisted of a series of pictures and correlated sets of questions. The pictures were selected to portray specific social studies concepts which were determined as appropriate to school program content of both
pre-kindergarten and first grade on the basis of a Professional Judgment Questionnaire which had been completed by teachers at the respective grade levels prior to picture selection and item writing. The pictures represented concepts in three major topical areas: home, neighborhood, and community. The test questions were designed to ascertain the level of children's understanding of the selected concepts and also to identify the type of thinking which was required to make their responses, i.e., thinking which was characterized by the acts of identification, association, or classification. The test was administered individually to each child in the sample groups.

The following sections of this chapter are organized into sections and sub-sections according to chronological and operational criteria. Observations regarding the analysis of the Professional Judgment Questionnaire which was used to validate the content of the test instrument are presented first. This is followed by an analysis of the test instrument used in the study. Accompanying the analysis of the test are some evaluative comments made by the investigator. Third is a statistical analysis and discussion of the data collected in the investigation. Lastly, there is a presentation of conclusions reached in the investigation and a list of generalizations based upon instrumentation procedures and the collected data which seem appropriate and relevant to the study.

ANALYSIS OF PROFESSIONAL JUDGMENT QUESTIONNAIRE

Although several sources were used for background information, textbooks, curriculum guides, and daily program guides provided the major
direction and content for developing the Professional Judgment Questionnaire. The questionnaire contained 115 items which pre-kindergarten and first grade teachers were asked to rate on a five point "Scale of Appropriateness."

For this purpose, appropriateness was defined as the amount of instructional time given to a particular topic or item. Teacher responses to the questionnaire were totalled and an average score computed for each item. The Professional Judgment Questionnaire was used to identify points of consensus among pre-kindergarten and first grade teachers regarding instructional emphases at their respective grade levels and, subsequently, as part of the data supporting the validity of the content materials incorporated into the test instrument.

A number of interesting impressions became evident in tabulating and analyzing teacher responses to the questionnaire. Several of these are listed and briefly discussed below.

1. Teachers in both pre-kindergarten and first grade instructional programs considered understanding the family and family members as an important part of children's learning, especially the mother's role and the child's role. An exception regarding the father or male role seemed to occur at the pre-kindergarten level. The inappropriateness of this topic related to the fact that in a large number of cases, fathers are absent from the home and that "many children have no male models." There was some feeling among pre-kindergarten teachers that four-year-olds, especially in a disadvantaged cultural setting, have difficulty understanding the concept of father. One teacher considered the topic to be "unrealistic and upsetting."

Due in part to the absence of the father from the home and to certain cultural limitations placed on family experiences, pre-kindergarten programs
dealt to only a limited degree with activities which depicted families doing things together. Teacher comments suggested that "children cannot identify with the family and the doing of things together," that "the family concept is too abstract and not within the experience of the child." First grade programs dealt more directly with father or male roles and experiences centered around family living. Teachers mentioned that many children in their class do live in extended family situations. Several first grade teachers indicated the importance of learning about and understanding the male role. Otherwise, as a first grade teacher stated, "children might never know what an average family is like or know that fathers do work usually." Investigating the child's concept of family and of family member roles seems to offer interesting and valuable research possibilities.

2. Programs at both levels of instruction emphasized the importance of self concept and of self understanding and allotted considerable time and effort to exploring the child's role in his environment and in the school setting. As expressed by a pre-kindergarten teacher, "self concept is very appropriate. Our aim is to help children understand themselves and to deal with emotions." There has been a substantial amount of research related to self concept such as that concerned with motivation, school achievement, failure, and mental health. However, varying school programs, utilizing different materials, and providing new experiences within the school appears to offer opportunities for further research with respect to knowledge of self and its relationship to learning.

3. Understanding the home in a broader context than family membership was indicated as an appropriate objective for pre-kindergarten and first grade programs of school work. At both levels of instruction, attention was given to common household items and their functions, and to basic
foods, fruits, and vegetables. Several teachers pointed out that household items vary considerably in their availability, their use, and their placement within deprived homes. Other teachers stated that "many children had never tasted even the most common fruits and vegetables" and that "children need help in recognizing the very basic foods."

As part of learning about the home in a broader social context, teachers in both pre-kindergarten and first grade programs reserved instructional time to promote understandings about persons who provide services directly to the home or to the immediate area. Pre-kindergarten programs were limited primarily to learning about persons in children's "immediate environment" with whom they have had some direct contact. First grade programs were more flexible and covered a wider range of community helpers.

4. Generally, instructional programs at both levels made provisions for developing understandings about the school. This included learning about school personnel, equipment and materials, and various activities. All the schools included in the study had special enrichment teachers and ancillary personnel in the primary grades.

5. Commonly, pre-kindergarten programs did not provide an acceptable amount of instructional time (in terms of appropriateness ratings) for dealing with the broader community, that is, the community beyond the immediate environment in which children live. Most instructional effort was directed towards learning about and experiencing things which directly touched the lives of the children. Exceptions to this included such topics as transportation, animals, and seasons. Several first grade teachers stated—sympathetically—that some children had never seen a farm, a park, or any woods.
6. According to the questionnaire responses, teachers of pre-kindergarten and first grade programs provided only a very limited amount of time to the goal of developing knowledge about and understanding of prominent persons, either of the past or of the present.

The Professional Judgment Questionnaire was useful in the study for determining content areas of pre-kindergarten and first grade programs. However, this type of procedure may be more useful in ascertaining instructional emphasis at one particular grade level than in the spanning of several grade levels. Concentrating on one grade level would permit a focus on specifics. As it was used, the questionnaire was designed to encompass general topics within a content area of two non-contiguous grade levels, this somewhat limited the concentration on the particulars which may have permitted more breadth and greater depth in the treatment of concept development at the first grade level of instruction.

It was noted in the processing of the questionnaires that teachers of pre-kindergarten provided substantially more personal comments than did teachers of first grade regarding characteristics and abilities of children in their classes. Perhaps this is due partially to the fact that pre-kindergarten is a specialized program and one which permits teachers more freedom to create and select. The fact that pre-kindergarten is a child's first contact with "school," and that differences among individuals or differences created by cultural and environmental factors tend to be more prominent or accentuated at this time may encourage pre-kindergarten teachers to make more personal comments about their pupils than first grade teachers do.

Teachers at both instructional levels stressed the limitations relative to learning which children possessed as the result of living in
a circumscribed environment. Nearly all teacher comments contained nuances regarding the effects of living in a disadvantaged milieu. Although teacher comments did not reflect a negativism towards the potentialities of children to learn, neither did they stress the positive characteristics of the disadvantaged such as the values of the extended family, the attainment of early independence, and the physical style of learning as abilities to be developed and utilized.

Supplemental comments made by teachers on the Professional Judgment Questionnaire tended to influence the selection of test pictures and the construction of test items. This aspect is discussed more fully in the following section.

ANALYSIS OF TEST INSTRUMENT

The test used in the study was designed and developed by the investigator to sample concept development among disadvantaged first graders. The test itself consisted of a series of pictures selected to represent concepts of the social studies which were deemed to have relevance both to pre-kindergarten and first grade curricula. In conjunction with the set of test pictures, there were sets of test questions structured to measure levels of understanding of the concepts represented by the picture section of the instrument. The test was administered individually to each member of the sample groups according to specified, written directions. A sample of the test format (pictures and test questions) is presented below.
Page 2 of the picture test booklet:

<table>
<thead>
<tr>
<th>Washing Machine (picture)</th>
<th>Pans (picture)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrigerator (picture)</td>
<td>Garbage Can (picture)</td>
</tr>
<tr>
<td>Stove/RANGE (picture)</td>
<td>Sink (picture)</td>
</tr>
</tbody>
</table>

Test questions (6-14) corresponding to page 2 of the picture test booklet are as follows:

Point to the picture or pictures which show:

a) something used to wash dirty clothes
b) a refrigerator
c) a faucet
d) things which use soap and water to do their jobs
e) an oven
f) things usually found in the kitchen
g) things mothers use in cooking meals
h) something used to keep food from spoiling
i) where frozen foods are kept.

As stated earlier, the test was composed of two major sub-categories: one dealing with topical areas which were representative of social studies content materials, the other relating to mental operations which were illustrative of thinking processes inherent in concept development and essentially associated with other phases of psychological functions.

The first draft of the test was used with a preliminary sample of subjects who were not included in the main part of the study. This technique was employed for the purpose of providing feedback from children regarding
the functionality and practicality of test pictures and test questions and the advisability of these being incorporated into the revised form of the test.

An analysis of children's responses to respective test items provided information regarding test items most frequently missed by members of sample categories. A listing of these questions and the number of children in each of the sample groups responding inappropriately to these items are presented in Table 4. The results shown in Table 4 are not intended to emphasize differences between sample classifications, for these differences are relatively unimportant and non-significant. These data appear to have more utility with regard to providing information for teachers, parents, administrators, and other interested parties about content and experiential areas in which children have limited knowledge and understanding. The questions missed most frequently by members of the respective sample groups may be viewed from at least two perspectives. Although these perspectives are not independent or clearly separate because of the nature of the questions and the content with which they deal, they generally can be characterized by the topical areas they represent and the type of thinking each question basically requires. With respect to topical areas, a greater percentage of questions was missed in each category as the content of the categories moved from the more immediate environment towards a more distant one. For example, 40 per cent or more of the children in the study missed 15 per cent of the questions in the home classification, 33 per cent of the questions in the neighborhood category and 38 per cent of the questions in the community classification. Of the thirty-five questions presented in Table 4, 20 per cent required the identification of an object, 25 per cent necessitated the association of an object with a particular function or use which
### TABLE 4

**SUMMARY: TEST QUESTIONS MOST FREQUENTLY MISSED**

<table>
<thead>
<tr>
<th>Test Question</th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
<th>Subject of Picture Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>26</td>
<td>24</td>
<td>29</td>
<td>furnishings which use soap and water</td>
</tr>
<tr>
<td>11</td>
<td>21</td>
<td>25</td>
<td>25</td>
<td>items found in the kitchen</td>
</tr>
<tr>
<td>19</td>
<td>b</td>
<td>21</td>
<td>22</td>
<td>a thermometer</td>
</tr>
<tr>
<td>22</td>
<td>27</td>
<td>31</td>
<td>27</td>
<td>items which do not use electricity</td>
</tr>
<tr>
<td>Neighborhood:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>24</td>
<td>33</td>
<td>33</td>
<td>activity after a snowfall</td>
</tr>
<tr>
<td>36</td>
<td>24</td>
<td>26</td>
<td>24</td>
<td>activities in school</td>
</tr>
<tr>
<td>38</td>
<td>35</td>
<td>24</td>
<td>37</td>
<td>places where safety rules are important</td>
</tr>
<tr>
<td>39</td>
<td>25</td>
<td>27</td>
<td>26</td>
<td>a life guard</td>
</tr>
<tr>
<td>46</td>
<td>22</td>
<td>25</td>
<td>24</td>
<td>people who wear uniforms</td>
</tr>
<tr>
<td>51</td>
<td>23</td>
<td>27</td>
<td>33</td>
<td>people whose jobs may be dangerous</td>
</tr>
<tr>
<td>53</td>
<td>23</td>
<td>23</td>
<td>23</td>
<td>a teacher helping children learn</td>
</tr>
<tr>
<td>55</td>
<td>23</td>
<td>34</td>
<td>26</td>
<td>children helping one another</td>
</tr>
<tr>
<td>57</td>
<td>22</td>
<td>23</td>
<td>23</td>
<td>children learning by pictures</td>
</tr>
<tr>
<td>Community:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>29</td>
<td>35</td>
<td>37</td>
<td>a factory</td>
</tr>
<tr>
<td>59</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>a stream</td>
</tr>
<tr>
<td>60</td>
<td>26</td>
<td>25</td>
<td>27</td>
<td>things associated with the country</td>
</tr>
<tr>
<td>63</td>
<td>21</td>
<td>27</td>
<td>25</td>
<td>things associated with the city</td>
</tr>
<tr>
<td>67</td>
<td>25</td>
<td>25</td>
<td>20</td>
<td>things associated with transportation</td>
</tr>
<tr>
<td>70</td>
<td>30</td>
<td>31</td>
<td>30</td>
<td>things associated with transportation</td>
</tr>
<tr>
<td>72</td>
<td>24</td>
<td>28</td>
<td>26</td>
<td>fastest mode of transportation</td>
</tr>
<tr>
<td>76</td>
<td>32</td>
<td>33</td>
<td>35</td>
<td>a rowboat</td>
</tr>
<tr>
<td>77</td>
<td>33</td>
<td>32</td>
<td>30</td>
<td>things with jet engines</td>
</tr>
<tr>
<td>79</td>
<td>36</td>
<td>40</td>
<td>38</td>
<td>things which travel over bridges</td>
</tr>
<tr>
<td>87</td>
<td>26</td>
<td>21</td>
<td>23</td>
<td>things which carry passengers</td>
</tr>
<tr>
<td>89</td>
<td>23</td>
<td>28</td>
<td>29</td>
<td>wild animals seen in a zoo</td>
</tr>
<tr>
<td>90</td>
<td>b</td>
<td>22</td>
<td>26</td>
<td>animals which have tusks</td>
</tr>
<tr>
<td>91</td>
<td>25</td>
<td>28</td>
<td>25</td>
<td>animals which provide meat</td>
</tr>
<tr>
<td>93</td>
<td>b</td>
<td>24</td>
<td>21</td>
<td>tame animals seen on a farm</td>
</tr>
<tr>
<td>94</td>
<td>38</td>
<td>41</td>
<td>36</td>
<td>smallest animal</td>
</tr>
<tr>
<td>95</td>
<td>21</td>
<td>26</td>
<td>21</td>
<td>animals which provide ham/bacon</td>
</tr>
<tr>
<td>96</td>
<td>35</td>
<td>37</td>
<td>32</td>
<td>animal which provides wool</td>
</tr>
<tr>
<td>98</td>
<td>21</td>
<td>25</td>
<td>b</td>
<td>a colt</td>
</tr>
<tr>
<td>101</td>
<td>26</td>
<td>36</td>
<td>28</td>
<td>zoo animals</td>
</tr>
<tr>
<td>102</td>
<td>25</td>
<td>27</td>
<td>25</td>
<td>a calf</td>
</tr>
<tr>
<td>103</td>
<td>b</td>
<td>21</td>
<td>23</td>
<td></td>
</tr>
</tbody>
</table>

*a Number of sample group members missing the respective test item.
*b Test question missed by less than 40 per cent of sample members.
*c Test questions missed by more than 40 per cent of sample members.*
an object serves, and 43 per cent of the questions required the classification of objects or things according to some common quality or characteristic. The nature of the type of mental operations which test questions required and the varying levels of difficulty which they appeared to possess are discussed more fully in the following sub-section which deals with the statistical analysis of the findings of the study.

The Kuder-Richardson formula Number 21 was utilized to ascertain the reliability or internal consistency of the instrument used in the study. Applying this formula, it was determined that the test had a reliability coefficient of .80. This indicates that the test items were relatively homogeneous, and that the instrument was reasonably suitable to the purpose for which it was designed.

The correlation matrix\(^1\) presented in Table 5 gives the correlation coefficient for each of the sub-categories utilized in the test instrument (Topical Areas and Mental Operations). The correlations ratios indicate the relationship between each sub-category and each of the other components of the test.

An examination of scores obtained by children in each of the topical areas indicated that there was a consistency of attainment by individuals among topical areas. Those who scored high in one area tended to score high in the other two areas. A similar observation was made for those who scored low. Those who were low scorers in one topical area tended to be low achievers in the other two areas. The fact that each sample group consistently maintained the same rank order as determined by mean scores and mean per

\(^1\) Derived from the BMD02D—Stepwise Regression Program. The Ohio State Computer Center.
TABLE 5

CORRELATION MATRIX FOR TOPICAL AREAS AND MENTAL OPERATIONS*

<table>
<thead>
<tr>
<th>Topical Areas</th>
<th>Mental Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H</td>
</tr>
<tr>
<td>Topical Areas</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>1.000</td>
</tr>
<tr>
<td>N</td>
<td>.636</td>
</tr>
<tr>
<td>Co</td>
<td>.643</td>
</tr>
<tr>
<td>Mental Operations</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>.653</td>
</tr>
<tr>
<td>A</td>
<td>.768</td>
</tr>
<tr>
<td>Cl</td>
<td>.688</td>
</tr>
</tbody>
</table>

*Key:

Topical Areas

H --Home
N --Neighborhood
Co--Community

Mental Operations

I --Identification
A --Association
C1--Classification

cent of correct answers (Table 12) for each of the topical areas appears to offer support for the observation that a correlative relationship seemed to exist between the individual's score in each of the topical areas and the rank order position of sample members in these areas.

Generally, the test instrument served the purpose for which it was designed, to measure levels of concept development among members of the respective samples. It was a useful device for sampling, within specified areas, the kinds of things about which disadvantaged first grade children
have some knowledge and understanding. Although the test is not practical (in its present form) for use by teachers because of the amount of time required for its administration, the technique of using pictures for determining levels of understanding and for instructional purposes seems appropriate and promising.2

As previously stated, one of the bases for determining the content of the test, i.e., the pictures and the questions was the Professional Judgment Questionnaire. Other sources included the professional literature and conversations with teachers from inner city schools. A majority of these sources seemed to emphasize the "limitations" of deprived children. Cues from these contacts and other experiential encounters tended to produce a mental set for the writer with reference to picture selection, item writing, and the expected general performance level of the children in the sample. As a result of having administered the test to nearly a hundred children, and of having scored all the individual response sheets, it seemed, from a subjective position, that disadvantaged children have considerably more knowledge, ability, and versatility than they are generally presumed to have or for which they have been given credit by many inner city teachers and writers of professional literature. This general observation is not meant to indicate that deprived children do not have a different experiential background than middle class children, that they do not need or require differentiated learning materials and teaching methods, or that

2 The procedure has long been used in IQ testing. Binet utilized pictures for this purpose early in the 1900's. The Peabody Picture Vocabulary Test is presently used rather extensively with young disadvantaged children. A recent application of pictures as instructional materials may be observed in the work of Raymond H. Muessig, Discussion Pictures for Beginning Social Studies. These materials are organized around 18 Personal-Social Themes (published by Harper and Row, Publishers, 1967).
there are not serious learning problems among the disadvantaged for, indeed, it seems that all of these and others are present. The investigator's reaction is the result of an emerging perspective which regards present capabilities of children from disadvantaged environments as a positive asset. This response tends to oppose an earlier psychological set developed during the initial part of the study which was disposed to emphasize the deprived nature of the disadvantaged child.

Based on this differing perspective, on information gained from test analysis, and on the distribution of test scores (Table 16), it seemed that the instrument and its usefulness could have been improved by including pictures and questions which represented broader areas of knowledge and which are of a higher difficulty level. Observations made by the investigator and those assisting in data collection pointed to a great variability among children regarding their knowledge of certain concepts. A substantial number of children attained scores at the upper end of the test score distribution. Perhaps other pictures and other test questions which explored depth of understanding of concepts or knowledge of concepts not included in the instrument would have yielded other kinds of useful information and would have presented a more comprehensive perspective of what deprived first grade children do know. It should be noted, also, that children at the lower extreme of test score attainment were seriously lacking in conceptual information. In several, and perhaps too many instances, the investigator observed a dearth of knowledge and experience in some children and felt complete hopelessness about them, hopelessness from the point of view that possibilities of their successful achievement in school appeared very bleak and that complete failure seemed inevitable. The area of concept development and growth among disadvantaged children offers a fruitful area
for research. Much more needs to be known about kinds and levels of knowledge, the effectiveness of various learning materials and teaching techniques, the accommodations of individual differences, and other related aspects of cognitive and conceptual learning.

DATA ANALYSIS

An Analysis of Variance for Factorial Design\textsuperscript{3} was utilized for data analysis in this study. Assistance and consultation regarding data analysis and computer utilization were extended to the investigator by various staff members associated with the Department of Psychology, the Department of Mathematics and Statistics, the Educational Research and Development Department, the Test Development Center, the Test Development Center, the Evaluation Center, and the Computer Center. All staff members and facilities were related to and were provided under the auspices of the Ohio State University.\textsuperscript{4}

A two-way analysis of variance was computed for each of the six factors contained within the test: (topical areas) home, neighborhood, community, (mental operations) identification, association, and classification. Additionally, a two-way analysis of variance was computed using the total scores of the above mentioned factors to present a composite

\textsuperscript{3} BMD02V--Analysis of Variance for Factorial Design, computer program. Obtained from The Ohio State University Computer Center.

\textsuperscript{4} The writer wishes to acknowledge those individuals who graciously provided assistance regarding the analysis of data for the study. Dr. Wallace Fotheringham of the Department of Speech, Dr. Thomas Wilke of the Department of Mathematics and Statistics, Bruce Gansneder of the Educational Research and Development Department, Dr. Jack Ott of the Test Development Center, Carol Estep of the Computer Center, and Daniel Tiro of the Evaluation Center.
or summary of the research design employed in the investigation. The .05 level of confidence was used in the study for recognizing and/or accepting significant differences within or among sample groups as determined by statistical analyses.

A summary table of each analysis of variance is presented on the following several pages. For the topical areas, a brief description of the content within the respective categories is presented in conjunction with an interpretation of the statistical analysis for the particular area.

Content in the topical area of the home dealt specifically with objects and things which are usually found in or have close proximity to children's homes. Children were asked to identify certain household items, to relate these items to their specific functions, and to classify some of the items according to where they are normally located in the home (refrigerator, washer, sink, oven, pans, garbage can). Other questions in this category dealt with household items which have different characteristics and functions (mixer, sewing machine, clock, tools, thermometer). One set of

**TABLE 6**

**ANALYSIS OF VARIANCE SUMMARY TABLE:**

**TOPICAL AREA--HOME**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups (3)</td>
<td>2</td>
<td>71.05334</td>
<td>35.52667</td>
<td>21.5790*</td>
</tr>
<tr>
<td>Sex (2)</td>
<td>1</td>
<td>16.00667</td>
<td>16.00667</td>
<td>9.77110</td>
</tr>
<tr>
<td>Interaction</td>
<td>2</td>
<td>8.29318</td>
<td>1.64659</td>
<td>.1951</td>
</tr>
<tr>
<td>Within Replicates</td>
<td>144</td>
<td>1210.23953</td>
<td>8.40444</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>149</td>
<td>1300.59273</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the .05 level*
questions was concerned with household tasks which mothers usually perform and the different kinds of things used in carrying out these tasks (washing, ironing, sewing, needle, thimble). Some questions requested children to identify common fruits and vegetables, and to classify some of these according to their own kind (carrots, corn, grapes, strawberries, beans, bananas).

Regarding the statistical analysis of the topical areas of home (Table 6), a statistically significant difference was found to exist between the sample groups at the .05 level of probability. There were no indications of significant differences between sexes or concerning the component of the ANOV which dealt with interaction, i.e., the variability of achievement of boys and girls with respect to the particular sample group they represented.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups (3)</td>
<td>2</td>
<td>102.57332</td>
<td>51.28666</td>
<td>592.84082*</td>
</tr>
<tr>
<td>Sex (2)</td>
<td>1</td>
<td>6.40667</td>
<td>6.40667</td>
<td>74.05698**</td>
</tr>
<tr>
<td>Interaction</td>
<td>2</td>
<td>0.17301</td>
<td>0.08651</td>
<td>0.00746</td>
</tr>
<tr>
<td>Within Replicates</td>
<td>144</td>
<td>1668.71965</td>
<td>11.58833</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>149</td>
<td>1777.87265</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at the .01 level
** Significant at the .025 level
Content representing the topical area of neighborhood moved beyond the immediate confines of the home to a somewhat broader environment, one in which children were likely to have had some experience prior to their entering the formal school program. In questions regarding neighborhood, children were directed to relate certain activities to seasons and weather, to indicate when it was warm or cold, and to identify situations where safety rules and safety-oriented behavior were particularly important. Children were asked to identify certain community helpers (policeman, fireman, postman, doctor, service station attendant) according to the different tasks they performed and to the kinds of apparel peculiar to them. Other questions related to school activities such as learning from books and pictures, and children helping themselves and each other.

The statistical analysis dealing with the content area of neighborhood as presented in Table 7 shows a significant difference between sample groups at the .01 level of significance. Further, there was a significant

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups (3)</td>
<td>2</td>
<td>244.83998</td>
<td>122.41999</td>
<td>12.95893</td>
</tr>
<tr>
<td>Sex (2)</td>
<td>1</td>
<td>272.02664</td>
<td>272.02664</td>
<td>28.78576*</td>
</tr>
<tr>
<td>Interaction</td>
<td>2</td>
<td>18.89352</td>
<td>9.44676</td>
<td>.38166</td>
</tr>
<tr>
<td>Within Replicates</td>
<td>144</td>
<td>3564.23846</td>
<td>24.75166</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>149</td>
<td>4099.99860</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the .05 level
difference between boys and girls at the .025 level of confidence. Only minimal variation of a non-significant nature, was indicated for the ANOV factor of interaction.

The final topical area to be considered, that of the community, is interpreted to mean the community in a broad sense, to relate to the broad range of knowledge and experience both in and beyond the immediate neighborhood and to include areas in which disadvantaged children might be expected to have had only limited experience. Questions in this content area required children to have knowledge of different forms of transportation related to land, water, and air travel and to be familiar with terms such as helicopter, jet, ocean liner, bus, boat, train, truck, and spacecraft. Forms of transportation were related to locations such as airports and expressways, and to functions such as carrying passengers and freight (large boxes or packages). Other questions in the topical area of community were concerned with animals, those which were tame or wild, those which were usually found on the farm or in the zoo, and those which had distinguishing characteristics.

Table 8, concerned with the statistical analysis of data regarding the topical area of community, shows a significant difference between boys and girls at the .05 level of significance. Other data from the analysis showed no meaningful difference between sample groups concerning the variable of interaction.

Table 9, 10, and 11 present the results of the analysis of variance for the three mental operations investigated in the study. Questions utilizing selected mental functions, although incorporated in the content material represented by topical areas, required certain types of thinking in order for children to respond appropriately to the test questions.
Because thinking processes are essential to concept development as well as to other areas of psychological functioning, it was thought that data regarding specified mental operations would be of value and would contribute useful information regarding certain thought processes.

Identificational thinking as used in the study entailed knowing and required the identifying of specific objects or things. Associational thinking necessitated the establishing or perceiving of relationships between objects, things, and/or situations. Classificational thinking required the categorizing of quantities or qualities according to some common factor or characteristic.

Discussion of mental operations and the implications gained from their statistical analyses will be pursued subsequent to their presentation in the following tables.

Information derived from the analysis of variance with reference to mental operations yielded only a limited amount of useful information.

**TABLE 9**

**ANALYSIS OF VARIANCE SUMMARY TABLE:**

**MENTAL OPERATION—IDENTIFICATION**

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups (3)</td>
<td>2</td>
<td>135.2933</td>
<td>67.64666</td>
<td>18.55030</td>
</tr>
<tr>
<td>Sex (2)</td>
<td>1</td>
<td>58.90667</td>
<td>58.90667</td>
<td>16.15359</td>
</tr>
<tr>
<td>Interaction</td>
<td>2</td>
<td>7.29331</td>
<td>3.64666</td>
<td>.33704</td>
</tr>
<tr>
<td>Within Replicates</td>
<td>144</td>
<td>1557.99937</td>
<td>10.81944</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>149</td>
<td>1759.49268</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source of Variance</td>
<td>Degrees of Freedom</td>
<td>Sum of Squares</td>
<td>Mean Squares</td>
<td>F</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------</td>
<td>----------------</td>
<td>--------------</td>
<td>---------</td>
</tr>
<tr>
<td>Groups (3)</td>
<td>2</td>
<td>118.81333</td>
<td>59.40666</td>
<td>12.05807</td>
</tr>
<tr>
<td>Sex (2)</td>
<td>1</td>
<td>99.22666</td>
<td>99.22666</td>
<td>20.14055*</td>
</tr>
<tr>
<td>Interaction</td>
<td>2</td>
<td>9.85342</td>
<td>4.92671</td>
<td>.26337</td>
</tr>
<tr>
<td>Within Replicates</td>
<td>144</td>
<td>2693.67896</td>
<td>18.70610</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>149</td>
<td>2921.57236</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at the .05 level

---

**TABLE 11**

ANALYSIS OF VARIANCE SUMMARY TABLE:
MENTAL OPERATION--CLASSIFICATION

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups (3)</td>
<td>2</td>
<td>77.65334</td>
<td>38.82667</td>
<td>4.33337</td>
</tr>
<tr>
<td>Sex (2)</td>
<td>1</td>
<td>47.04000</td>
<td>47.04000</td>
<td>5.25004</td>
</tr>
<tr>
<td>Interaction</td>
<td>2</td>
<td>17.91984</td>
<td>8.95992</td>
<td>.56030</td>
</tr>
<tr>
<td>Within Replicates</td>
<td>144</td>
<td>2302.71906</td>
<td>15.99110</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>149</td>
<td>2445.33224</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
It did, however, provide the satisfaction of having evidence from computation that no statistically significant difference existed between sample groups, between sexes and sample groups (interaction), or, with one exception, between sexes. The exception to the latter case is the significant difference noted between sexes in associational thinking which was at the .05 level of probability.

Table 12 presents, in summary form, an analysis of data which represents an overall perspective of the design used in the study, that of investigating the development of concepts among deprived first grade children. The analysis of variance for this data showed that a significant statistical difference did exist among sample groups at the .025 level of confidence. This means that among the three samples of first grade children there was a significant difference between or among them with respect to differentiated levels of concept development. Therefore, the null hypothesis

| TABLE 12
| ANALYSIS OF VARIANCE SUMMARY TABLE:
| TOTAL TEST SCORES |
|-------------------|-----------------|----------------|---------|
| Source of Variance | Degrees of Freedom | Sum of Squares | Mean Squares |
| Groups (3)         | 2               | 1050.03999     | 525.02000   |
| Sex (2)            | 1               | 568.42668      | 568.42668   |
| Interaction        | 2               | 15.45386       | 7.72693     |
| Within Replicates  | 144             | 14037.03479    | 97.47941    |
| Total              | 149             | 15670.95532    |           |

* Significant at the .025 level
used in the study (which stated that there were no significant differences among samples with reference to concept development) is rejected. Levels of achievement relative to concept development were distinguishable and consistent among the sample groups. This finding is discussed more completely later in this section because of the particular nature of the finding.

The second null hypothesis of major interest in the study (which stated that there were no significant differences between or among samples with regard to mental operations) has been supported by the data and their statistical relationships. The level of significance, inferentially determined from the separate analysis of variance for each of the mental operations, indicated that obtained differences among samples have a high probability of occurring by chance. In cases where the null hypothesis has been proposed and where differences could easily arise on the basis of chance, as in this instance, the null hypothesis is not rejected but stands.\(^5\)

Although significant differences were not indicated by the analyses as presented in Tables 9, 10, and 11 with reference to mental operations, there was, as with the topical areas, a consistent pattern of achievement among sample groups. Based on this, sample groups may be placed in rank order according to levels of attainment in the utilization of mental operations. A discussion of the achievement levels is presented more fully later in this section.

The data presented in Table 12 indicated a statistically significant difference at the .025 level of probability between boys and girls with

respect to levels of concept development as determined by the instrument used in the study. The consistency of achievement responses between sexes which is shown in Table 13 indicated that the mean achievement for boys was consistently higher than the mean achievement for girls. Patterns of achievement between sexes as determined by the test instrument tended to operate in a parallel relationship. Further, data from the analysis showed no significant or meaningful difference regarding interaction with respect to sexes, sample groups, and the sub-categories employed in the study.

Closer inspection and examination of the data which was made available through the analyses of variance and other information which appeared on the computer printouts accompanying these analyses disclosed an interesting, although somewhat unexpected finding. The noted significant statistical difference among sample groups tended to favor sample Group I, the sample group without pre-kindergarten experience. The consistent difference in achievement between sample groups is seen in Table 13 which shows the sample groups means and mean percent of correct answers for each of the sub-categories of the test. These data make apparent the rank order of sample groups a) according to mean scores for each of the sub-categories, b) according to the mean percent of correct answers, and c) according to the total test score means. Based on these criteria, sample Group I (no pre-K) ranked first, sample Group III (twenty-six week pre-K) ranked second, and sample Group II (eight week pre-K) ranked third. Results of the t test\(^6\) used to verify the probability level of difference

\[^6\] Ibid., pp. 138-141.
between sample Group I and sample Group II indicated that the difference was statistically significant at the .01 level of confidence. It was further determined that the differentiated level of achievement between sample Group I and sample Group III was not of statistical significance.

Subsequent study of the various analyses and other data assembled during the investigation did not reveal any apparent reason(s) for the statistically significant difference found to exist between the non-pre-kindergarten sample group and the eight week pre-kindergarten sample group. Several hypotheses are presented in the following chapter which serve as alternative possibilities of explanation for this particular study finding.

Sample Group III (twenty-six week pre-kindergarten) consistently, and without exception, achieved higher mean scores and mean percent of correct answers than did sample Group II (eight week pre-kindergarten) for each of the sub-categories as well as for the test as a whole. Sample Groups II and III possessed an equivalency measure (that of having had pre-kindergarten) not shared by sample Group I. Members of these sample groups met the entrance requirements of the pre-school program (levels of family income as determined by an Index of Poverty) and, subsequently, were selected for and participated in the pre-kindergarten educational experiences. The t test was employed to determine if significant differences existed between sample Group II and sample Group III. The yielded t ratio\(^7\) indicated that there were no significant differences between these sample groups as represented by scores obtained on the instrument used in the study. Although differences between

\(^7\) Ibid.
TABLE 13
SUMMARY TABLE OF SUB-CATEGORIES:
MEANS AND MEAN PERCENT OF CORRECT ANSWERS

<table>
<thead>
<tr>
<th>Sub-Categories</th>
<th>Possible Score</th>
<th>Mean Score</th>
<th>Mean Percent of Correct Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group I</td>
<td></td>
<td>24.16</td>
<td>80.53</td>
</tr>
<tr>
<td>Group II</td>
<td></td>
<td>22.56</td>
<td>75.20</td>
</tr>
<tr>
<td>Group III</td>
<td></td>
<td>22.90</td>
<td>76.33</td>
</tr>
<tr>
<td>Neighborhood</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group I</td>
<td></td>
<td>19.20</td>
<td>71.11</td>
</tr>
<tr>
<td>Group II</td>
<td></td>
<td>17.22</td>
<td>63.78</td>
</tr>
<tr>
<td>Group III</td>
<td></td>
<td>17.84</td>
<td>66.07</td>
</tr>
<tr>
<td>Community</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group I</td>
<td></td>
<td>31.58</td>
<td>64.58</td>
</tr>
<tr>
<td>Group II</td>
<td></td>
<td>28.50</td>
<td>59.38</td>
</tr>
<tr>
<td>Group III</td>
<td></td>
<td>30.52</td>
<td>63.58</td>
</tr>
<tr>
<td>Identification</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group I</td>
<td></td>
<td>29.10</td>
<td>83.14</td>
</tr>
<tr>
<td>Group II</td>
<td></td>
<td>26.82</td>
<td>76.63</td>
</tr>
<tr>
<td>Group III</td>
<td></td>
<td>27.56</td>
<td>78.74</td>
</tr>
<tr>
<td>Association</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group I</td>
<td></td>
<td>24.48</td>
<td>69.94</td>
</tr>
<tr>
<td>Group II</td>
<td></td>
<td>.</td>
<td>63.71</td>
</tr>
<tr>
<td>Group III</td>
<td></td>
<td>23.38</td>
<td>66.80</td>
</tr>
<tr>
<td>Classification</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group I</td>
<td></td>
<td>21.12</td>
<td>60.34</td>
</tr>
<tr>
<td>Group II</td>
<td></td>
<td>19.36</td>
<td>55.31</td>
</tr>
<tr>
<td>Group III</td>
<td></td>
<td>20.32</td>
<td>58.06</td>
</tr>
<tr>
<td>Total Score</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Group I</td>
<td>105</td>
<td>74.94</td>
<td>71.37</td>
</tr>
<tr>
<td>Group II</td>
<td>105</td>
<td>68.48</td>
<td>65.22</td>
</tr>
<tr>
<td>Group III</td>
<td>105</td>
<td>71.26</td>
<td>67.39</td>
</tr>
</tbody>
</table>
sample Group II and III were not statistically significant, sample Group III maintained a constant quantitative advantage over sample Group II in all test sub-categories.

**Table 14**

**A Quartile Analysis of Sample Test Scores**

<table>
<thead>
<tr>
<th>Upper 25 Per Cent of Scores</th>
<th>Lower 25 Per Cent of Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Group I</td>
<td>Sample Group II</td>
</tr>
<tr>
<td>89</td>
<td>97</td>
</tr>
<tr>
<td>88</td>
<td>87</td>
</tr>
<tr>
<td>87</td>
<td>85</td>
</tr>
<tr>
<td>87</td>
<td>84</td>
</tr>
<tr>
<td>86</td>
<td>81</td>
</tr>
<tr>
<td>86</td>
<td>80</td>
</tr>
<tr>
<td>86</td>
<td>79</td>
</tr>
<tr>
<td>86</td>
<td>79</td>
</tr>
<tr>
<td>85</td>
<td>78</td>
</tr>
<tr>
<td>84</td>
<td>78</td>
</tr>
<tr>
<td>84</td>
<td>77</td>
</tr>
<tr>
<td>86.25*</td>
<td>82.17*</td>
</tr>
</tbody>
</table>

* Computed means for respective upper and lower quartile scores.

Data obtained from test scores were further analyzed in various ways to determine if other meaningful relationships or differences existed between or among sample groups. A quartile analysis (Table 14) was utilized to investigate relationships among test scores for members of sample groups appearing in the upper and lower quartile range of test scores. In this procedure, the upper 25 per cent and the lower 25 per cent of test scores for each sample group were placed in a rank order position for comparison purposes. Mean scores were computed for test scores for each sample group in the respective quartile range. In this particular instance, the use of
the quartile analysis did not yield any different or additional information. The likenesses and differences between sample groups were relatively constant and tended to support findings derived from previous analyses, basically those which showed the rank order of achievement among sample groups.

Another means of analyzing data from the investigation consisted of viewing achievement levels according to the specific school which members of sample groups attended. Mean scores of schools and the relative position of schools to each other with respect to mean achievement level are presented in Table 15 and Figure 2.

Among the schools used in the study, schools B, D, F and J attained the lowest mean scores. Although there was not a decisive skewness in the percent of representation from each of the sample groups within the four schools, these schools had a higher proportionate share of members from both sample Groups I and III (higher achieving) than from sample Group II (lower achieving). This particular type of sample group representation poses an interesting question: Why was achievement lowest in these schools even though a greater proportionate number of children from higher achieving sample groups were represented?

Of the four schools (G, K, L and M) which obtained the highest mean scores, two schools in this category had no members from sample Group II (lowest achieving). This type of representation may account for their relative position of mean score achievement among schools. The other two schools in this classification, however, had a higher proportionate representation of members from sample Group II and yet obtained test scores to place them in the category of highest achieving schools. Again a question: Why were schools G and M among the highest achieving schools when a
TABLE 15
DISTRIBUTION AND MEAN SCORES OF SAMPLE GROUPS BY SCHOOLS

<table>
<thead>
<tr>
<th>School</th>
<th>Sample Group I*</th>
<th>Sample Group II*</th>
<th>Sample Group III*</th>
<th>Total</th>
<th>Sample Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>10</td>
<td>72.900</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>13</td>
<td>67.153</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>5</td>
<td>73.200</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>9</td>
<td>66.888'</td>
</tr>
<tr>
<td>E</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>14</td>
<td>70.357</td>
</tr>
<tr>
<td>F</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>11</td>
<td>65.909</td>
</tr>
<tr>
<td>G</td>
<td>6</td>
<td>4</td>
<td>8</td>
<td>18</td>
<td>74.777</td>
</tr>
<tr>
<td>H</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>69.200</td>
</tr>
<tr>
<td>I</td>
<td>5</td>
<td>9</td>
<td>0</td>
<td>14</td>
<td>70.714</td>
</tr>
<tr>
<td>J</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>10</td>
<td>66.700</td>
</tr>
<tr>
<td>K</td>
<td>7</td>
<td>0</td>
<td>2</td>
<td>9</td>
<td>78.222</td>
</tr>
<tr>
<td>L</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>6</td>
<td>78.333</td>
</tr>
<tr>
<td>M</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>6</td>
<td>75.333</td>
</tr>
<tr>
<td>N</td>
<td>8</td>
<td>7</td>
<td>5</td>
<td>20</td>
<td>73.345</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>150</td>
<td>71.56</td>
</tr>
</tbody>
</table>

* Number of children in each of the respective schools.

greater percentage of sample members attending them were from the lower achieving sample group?

Examining the mean scores of sample groups with reference to particular schools did not provide any specific additional data or indicate any apparent pattern of achievement which would relate to the study or which would serve to offer explanations of the particular results obtained in the investigation. As previously indicated, it did raise some interesting questions.

It appears that research studies designed to compare achievement results of children according to the school they attend would provide useful information regarding causation factors relative to differentiated attainment levels among disadvantaged children.
The final technique used to present and analyze data collected in the study is a frequency distribution of test scores among sample groups. Table 16 indicates that the distribution of test scores favored sample Group I, that is, in sample Group I there was a greater frequency of test scores in the upper half of the test score range. The table also shows that a greater portion of test scores of sample Group II were in the lower range. Sample Group II had the greatest difference in the range of test
scores. The frequency distribution of total test scores tends to affirm the previously stated statistical difference obtained between sample Groups I and II.

TABLE 16
FREQUENCY TABLE OF TOTAL TEST SCORES
ACCORDING TO SAMPLE GROUPS

<table>
<thead>
<tr>
<th>Interval</th>
<th>Sample Group I</th>
<th>Sample Group II</th>
<th>Sample Group III</th>
</tr>
</thead>
<tbody>
<tr>
<td>95-100</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90-94</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85-89</td>
<td>9</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>80-84</td>
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Information gained from the analysis of data collected in the study make possible certain observations with respect to concept development and levels of achievement among disadvantaged children in the first grade. These observations, in the form of inferences and conclusions, represent the findings of the study. These are presented below.

a) The main hypothesis of the study which stated that no differences existed between sample groups with reference to concept development was rejected at the .025 level of confidence. Significant differences were noted between sample groups.
b) The second hypothesis which the study was designed to test, which was that no differences existed between sample groups regarding mental operations, was not rejected. Minimal differences between sample groups had a high probability of occurring by chance.

c) In all sub-categories of the test, Group I consistently attained higher scores than sample Groups II and III. Sample Group III, although attaining scores somewhat less than sample Group I, consistently achieved higher scores than sample Group II in all sub-categories. Accordingly, when ranked in descending order based on mean scores for all sub-categories and on the total mean score for each sample group, Group I ranked first, Group III was second, and Group II was third. Due to the particular pattern of achievement among sample groups and to the consistency with which this occurred, it was inferentially determined that the significant difference among groups was in favor of sample Group I. This finding was confirmed by the application of the t test which showed a statistically significant difference between sample Group I and sample Group II at the .01 level of confidence.

d) Regarding topical areas, all sample groups attained the highest mean score in the category of home, a lesser mean score in the category of neighborhood, and still lesser mean score in the category of community. Thus, topical areas ranked according to mean scores attained by the three sample groups placed home first, neighborhood second, and community third. This particular ranking seemed to suggest that children's awareness and knowledge of social studies concepts as determined by the test instrument tended to become progressively less as content emphasis moved from the more immediate environment to a more distant or remote one. This finding was further supported or affirmed by data from Table 4 which showed that, proportionately,
a greater number of test questions were missed in the topical area of commu-
nity than in the topical area of neighborhood, and that a greater number of
questions were missed in the category of neighborhood than in the category
of home.

3) In the utilization of mental operations, higher mean scores and higher
mean percent of correct answers were obtained by all sample groups for identifi-
cational thinking than for the other two mental operations. Similarly,
higher mean scores and higher mean percent of correct answers were obtained
by all sample groups for associational thinking than for classificational
thinking. This finding tended to suggest that disadvantaged first grade
children were more capable of using certain types of thinking processes than
others, and that the mental operations utilized in the study had varying
levels of difficulty which seemed to be ordered in a hierarchical arrange-
ment according to degrees of difficulty or complexity inherent in the parti-
cular mental operation.

The conclusions that children seemed to have more knowledge in some
selected topical areas than in others (d) and that certain types of mental
operations appeared to be more difficult for children than others (e) posed
a question regarding the distribution of test questions with varying degrees
of difficulty among the topical areas used in the study. It is noted, there-
fore, that test questions requiring associational and classificational types
of thinking, although not equally distributed among topical areas, were
sufficiently equivalent so as not to disqualify the finding suggested in
parts d and e above.

f) Differential achievement levels were obtained by boys and girls.
The ANOV (Table 12) indicated a statistically significant difference be-
tween sexes. These data showed that achievement differences favored boys.
Mean scores and the mean percent of correct answers for all sub-categories indicated, without exception, that boys achieved higher than girls. This was true not only for sample Group I (no pre-kindergarten) but also for sample Groups II and III (with pre-kindergarten).

g) A quantitative achievement differential was found to exist between sample Group II (eight week pre-kindergarten) and sample Group III (twenty-six week pre-kindergarten). Although this difference was not statistically significant, it was consistent among all sub-categories and in total test score attainment. This suggests, or at least offers the possibility, that extended pre-kindergarten experiences make a quantitative difference in concept development and achievement among disadvantaged first graders as compared with deprived children who have experienced a more limited amount of time in pre-kindergarten programs.

h) Test scores obtained from a single test designed to measure knowledge or achievement in a specific area are normally expected to be grouped in a relative fashion. However, to increase the usefulness of the instrument employed in the study it was thought that test items covering additional and/or different content materials and having a higher degree of difficulty would possibly have provided more data about children's concepts and would have been even more effective in determining differences among sample groups regarding levels of knowledge or concept development.

Research, including doctoral dissertations, could well be directed to the task of developing tests to be used with disadvantaged children.

In the preceding portion of this chapter attention has been given to various procedures and techniques which have provided data relevant to the findings of the study. First discussed were the implications of the Professional Judgment Questionnaire which was used to validate the content
of the test instrument. A description of the test developed for purposes of the study and observations about its usage were presented. Finally, the analyses of the data collected in the study to measure concept development and related sub-categories were given in table form and discussed in the body of the text. From these and the total experience of having pursued this study, a list of generalizations regarding the findings of the investigation has been derived. These are presented below.

a) Disadvantaged children in the first grade appear generally to have a greater fund of knowledge regarding certain categories of social studies content than they do others. Children demonstrated an availability of more knowledge in subjects which dealt with the immediate environment than in content topics which were concerned with a geographically more distant social and economic milieu.

b) First grade children from disadvantaged areas appear to have the capabilities for utilizing certain mental operations essential to concept development and other aspects of psychological functioning.

c) Mental operations employed in concept development and in other processes of thinking tend to be arranged in a hierarchial order of difficulty. Disadvantaged children in the first grade have more difficulty utilizing certain mental functions than others and can more capably employ mental operations of a simpler nature than those of a more complex character.

d) Among deprived children in the first grade, boys tend to achieve at a higher level than girls of the same grade placement. Boys appear to have more knowledge of selected social studies content and more proficiency in utilizing certain thinking processes.

e) Extended periods of pre-kindergarten experience seem to produce a quantitative advantage in social studies knowledge and in specified thinking
processes for children who participate in these programs as compared with children who have experienced more limited pre-school opportunities. This quantitative differential tends to carry over into the first grade and to be observable or measurable in the latter portion of that instructional level. Perhaps pre-kindergarten programs of longer durations provide additional opportunities for learning and reinforcement than do similar programs of shorter time periods, and subsequently, permit and aid in a greater accumulation of knowledge and retention of that knowledge. Such lengthened pre-school programs may also establish within the deprived child skills and behaviors which approximate, and are more consistent with, the expectancies of the more formalized instructional program of kindergarten and first grade.

f) Disadvantaged children appear to have a greater fund of knowledge than they are assumed to have or are frequently given credit for by some-classroom teachers and writers in the professional literature. All children had some conceptual knowledge of the content topics evaluated. It was apparent that some children had more complete knowledge of certain topical areas than they did others. Most concepts tested seemed to be within the realm of children's knowledge for few respondents displayed a complete void in their thinking or otherwise indicated they did not know.
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

SUMMARY

This study, which is concerned with disadvantaged children, was undertaken because of a personal-professional interest of the investigator in education for the deprived and because of the timeliness of the topic. The main purpose of the study was to investigate and/or determine effects of pre-kindergarten programs upon disadvantaged children with respect to their concept development and secondly, with reference to their ability to utilize certain mental operations. In addition to the major focus of the study, the inquiry sought to provide information regarding certain objectives which were considered part of and relevant to the investigation.

A brief description of the study design and of certain operational procedures employed in the investigation provide the background for the remaining portion of this chapter. The samples used in the study were randomly selected from a stratified population of first grade children. These sample members attended one of the inner city schools which, according to stated criteria, were chosen to be utilized in the investigation. Classifications within the population were pre-established and were characterized by differentiated pre-kindergarten experience: no pre-kindergarten, eight weeks of pre-kindergarten, and twenty-six weeks of pre-kindergarten. Each sample group consisted of fifty disadvantaged children,
twenty-five boys and twenty-five girls, who were chosen to represent the three levels of pre-kindergarten experience.

The test instrument used in the study to measure concept development and the ability to use selected thinking processes was developed by the investigator. A Professional Judgment Questionnaire, designed for the study, was utilized to validate social studies content materials incorporated into the test. The revised form of the test was administered individually to all sample members by means of a structured interview.

Analyses and examination of data collected in carrying out the study revealed the following findings:

a) A significant difference (.025 level of confidence) was found to exist among sample groups with respect to concept development (main hypothesis).

b) The statistically significant difference among sample groups with reference to concept development favored sample Group I, the sample group composed of disadvantaged children who did not attend pre-kindergarten.

c) Significant differences were not noted among sample groups regarding the utilization of mental operations (secondary hypothesis).

d) In total test achievement, sample Group I (no pre-K) ranked first, sample Group III (twenty-six week pre-K) ranked second, and sample Group II (eight week pre-K) ranked third. These respective ordered positions were also maintained for each of the sub-categories of the test.

e) Sample Group III (twenty-six week pre-K) maintained a constantly higher achievement level (sub-categories and total test) than sample Group II (eight week pre-K). The resultant quantitative achievement differential for sample Group III, however, was not statistically significant.
f) Boys achieved consistently higher than girls in concept development and in the use of mental operations. The difference in achievement between sexes was significant at the .025 level of confidence for concept development but not statistically significant for mental operations.

g) With respect to obtained achievement levels among sample groups, topical areas (representations of social studies curricular materials) assumed a rank order placement. Sample groups attained highest in the topical area of home, less in the topical area of neighborhood, and least in the topical area of community.

h) The majority of members of sample groups knew or had some knowledge of social studies concepts included in the test instrument. It was apparent, however, that there were different levels of knowing among sample members and sample groups.

i) Mental operations employed in the study appeared to possess varying levels of difficulty. The mental operation of identification seemed to be least difficult, association more difficult, and classification seemed to be most difficult.

j) Members of sample groups appeared capable of performing the mental operations required to respond appropriately to the test questions. As noted in i above, sample members had more facility in using some mental operations than others.

CONCLUSIONS

These findings derived from the analysis and examination of data collected in the study permitted certain conclusions or generalizations. Although these have specific reference to the first grade population
from which the samples were drawn, they are likely to be generalizable or applicable to other disadvantaged first grade children in other relatively large cities or urban areas. Conclusions relative to the study are:

a) Longitudinal experiences in pre-kindergarten appear to produce a quantitative advantage among disadvantaged first grade children with reference to concept development as compared with a more limited participation in pre-school programs.

b) Among deprived first grade children, boys tend to have higher conceptual development and knowledge than girls regarding content materials of the social studies. Boys also seem to have a greater facility than girls for using selected thought processes.

e) Generally, it appears that pre-kindergarten experiences do not produce any significant or marked difference in the ability of disadvantaged first grade children to utilize certain fundamental thinking processes (mental operations).

d) Disadvantaged children at the first grade level of instruction tend generally to have more awareness and knowledge of social studies content which deals with the immediate than with content material which emphasizes knowledge and understanding of settings of a more distant nature.

e) It seems that children can perform certain types of thinking more capably than they can achieve others. Various aspects of thought tend to differ in degrees of difficulty.

f) Regarding the knowledge aspects of the social studies in the first grade, deprived children appear to know more than they are frequently given credit for knowing.
g) It appears that disadvantaged children are often characterized by limitations which are environmentally created than by abilities or capabilities which are personally possessed.

Theoretically, one would assume that disadvantaged children with pre-kindergarten experience would achieve higher in knowledge areas than deprived children without pre-kindergarten experience. The position is well founded, and broadly accepted, that the early years of a child's life are critical to developing his intellectual capacities. Thus, stimulation in the formative years tends to increase the probability of intellectual growth and development. Likewise, concept development in children depends directly upon experience, experience which enables the learner to establish multiple points of reference, to accommodate innumerable perceptual impressions, and ultimately, to create a large number of personalized mental images representative of these experiences. Many research studies report significant initial gains in a number of abilities and achievement areas among children attending pre-kindergarten programs. Some inquiries into the longitudinal effects of pre-kindergarten have shown quantitative differences between children with pre-school experience as compared with children without these experiences. Other studies of a longitudinal nature report no differences among children regardless of the type of pre-school experience they have had. It appears, therefore, from a logical basis and from research evidence that there tends to be support for the assumption that disadvantaged children with pre-kindergarten experience do as well as, if not better than, deprived children without pre-school in matters of intellectual or academic achievement. An interesting and unexpected finding of the study was that members of the sample group without pre-kindergarten achieved significantly higher than members of the sample
group with eight weeks of pre-kindergarten and consistently higher (not statistically significant) than children in the sample group with twenty-six weeks of pre-kindergarten. A critical search and reexamination of the research data from the study did not disclose any perceptible reason(s) for this particular result. So that this finding does not go unattended, several hypotheses are proposed as partial or possible explanation.

Hypothesis A: Pre-school aged children growing up in a deprived environment do not have the necessary maturational and/or intellectual development to enable them to take full advantage of pre-kindergarten programs as they presently exist.

Hypothesis B: Deprived young children who qualify for pre-kindergarten experience and attend have, or are influenced by, a different set of contributing factors than disadvantaged children who fulfill pre-school requirements but who do not attend.

Hypothesis C: Disadvantaged children having pre-kindergarten experience react and respond differently to subsequent educational experiences than deprived children not having pre-school experience.

Hypothesis D: The possibility of maximizing educational achievement resulting from pre-kindergarten programs for the deprived is enhanced in situations, or in such cases, where subsequent educational experiences are designed to accommodate and extend achievement gains and behavioral changes attained by children who have participated in planned pre-school programs.

Hypothesis D: Teachers at kindergarten and first grade levels of instruction perceive children with pre-kindergarten experiences differently than those without pre-school participation. Consequently, teachers respond dissimilarly, either consciously or unconsciously, towards children with as compared to children without pre-school experience.
These hypotheses are not intended to be totally comprehensive or all inclusive but, instead, are intended to represent alternative possibilities of explanation of the particular, previously stated, study finding. Each hypothesis seems to be susceptible to statistical treatment and to lend itself statistical design.

The stratification of a population created by self selection reflects upon one of the major limitations of ex post facto research, the inability of a researcher to assign subjects to groups and to assign treatment to groups at random. In ex post facto research, subjects and treatments are pre-assigned through self selection by conditions or circumstances present in the problem being studied. For example, in this study members of sample groups, although randomly selected, were drawn from a pre-established stratified population which may or may not have been biased because of its quality of pre-kindergartenness or non-pre-kindergartenness. Regarding this, the possibility existed that members of sample Groups II and III (with pre-K) were deprived to a greater degree initially than children in sample Group I (no pre-K). One of the basic qualifications for the pre-kindergarten program was that of financial destitution. The fact that children in sample Groups II and III were enrolled in pre-kindergarten indicated that they were from low income families and provided an equivalency condition between these two sample groups which appeared with some uncertainty in sample Group I. An economic factor and its resultant influence upon members of sample Group I may have been a contributing condition to the particular group achievement patterns evidenced in the study. If, indeed, members in sample Groups II and III were more disadvantaged than those in sample Group I, perhaps pre-kindergarten experience contributed to reducing differences between members of sample groups regarding
school achievement and concept development, and to increasing the probability of success in school among members of pre-school groups. The recently instituted programs, Follow-Up and Follow-Through, will undoubtedly provide valuable information regarding the longitudinal effects of pre-kindergarten and the kinds of curricular adaptations and modifications which seem most appropriate to the articulation of children with pre-school experience into the formal school program.

Considerable attention and effort was given in the study to establish measures of sample group equivalency. Population criteria were employed to control as many relevant factors as possible. Even with these rather stringent criteria, there remained the realization that complete control over all related variables was not possible. Although subsequent research studies on the topic of pre-school education for the disadvantaged will probably not deal specifically with the particular findings of this investigation, they may encounter similar research problems. This study serves to point out the need for well thought out research designs which recognize certain limitations and issues, and utilize precautionary measures to accommodate or avoid them.

The study finding which depicted a significant difference between the sample groups, in favor of the sample groups without pre-kindergarten, does not condemn the concept of pre-school education nor does it mitigate against the pre-school program which other members of the sample groups had experienced. Rather, the finding seems to suggest that not all the data are in and not all the questions regarding pre-kindergarten experiences for the disadvantaged are answered.

This study was confined to a single component of individual intellectual growth and to a select, but important, aspect of the broad goals
and objectives of the pre-school program. Pre-kindergarten purposes which stress the development of self concept, the implications of the socialization process, the concern for physical and dietary needs, and the formulation of healthy mental attitudes, to mention only a few, represent the comprehensiveness of pre-school programs which, philosophically, are concerned with the child as a totality. The study finding encourages persons committed to or interested in pre-school education for the deprived not only to look critically at the various components of the educational program such as capabilities of children, curricular materials, teaching methods, teacher behavior, and duration of experiences but to question certain of the basic assumptions which provide the foundation for education in general and pre-school education in particular.

It is generally assumed that "education is good for everyone." This assumption has established compulsory school attendance and has required children, at a legally defined age, to attend school. Age requirements for entrance into formal schooling is based on the assumption that children at the age of six or seven can capably and successfully meet the expectations established by the school curriculum. Regarding pre-school education for the deprived, several questions seem to be in order: Are brief exposures to educational programs better than none at all? Do pre-school programs which are hurriedly and/or inadequately planned, staffed, and executed, produce negative or positive learnings and reactions in disadvantaged children? What safeguards are essential for pre-kindergarten programs to assure psychological and emotional stability and growth for the disadvantaged?
OBJECTIVES OF THE STUDY

The results of the study, in addition to furnishing information relative to the main hypotheses of the investigation, provided data regarding specified objectives of the investigation. Each objective appears below and is accompanied by a brief commentary. Statements, concomitant to the presentation of the objectives, are qualified by the area with which the study was concerned and by the test instrument used for data collection.

Objective 1: To provide objective data which may serve as one basis for validating or invalidating subjective evaluations made regarding the effectiveness of pre-kindergarten programs.

The fact that consistent quantitative differences were noted among sample groups a year and a half after the pre-school program had been completed lends credence to certain subjective evaluations stressing the value of pre-kindergarten experience. Findings of the study tend to support the notion that extended pre-kindergarten programs effect gains in intellectual and conceptual development. Sample members with brief pre-kindergarten experience achieved less as compared with children in the sample group with extended pre-school participation.

The finding that members of the non-prekindergarten group showed superior achievement tends to support the position which questions the long-term effects of pre-school. Because there appears to be an unclear relationship between pre-kindergarten learning and subsequent educational experiences, conclusive statements cannot be made regarding the longitudinal influences of pre-kindergarten. The uncertainty contained within this reference clearly indicates the need for further research in this area.
Objective 2: To contribute to the accumulation of knowledge regarding effects of pre-school programs upon disadvantaged children.

The results of the study fulfill this objective in a general way. Obtained differences in achievement among sample groups reflected distinguishable levels of knowing among first graders with reference to selected social studies content. Other evidence pointed to the varied ability between sexes with respect to topical areas and mental operations. Such results contribute objective data to the accumulation of information pertaining to the influence of pre-school experience upon young deprived children.

Objective 3) To provide data which may be utilized in making curricular plans and decisions regarding the social studies at the first grade level of instruction.

Study results indicated consistently that disadvantaged first grade children had more knowledge in certain areas of the social studies than others; that knowledge and understanding was greater in areas in which children had had direct experience; that factual information and comprehension was less in topical areas which were more remote from their everyday experience and in which they had had little or no exposure. This suggests that initially, instructional emphasis should deal with, relate to, and extend from subject areas in which children demonstrate the greatest amount of knowledge. There were also indications that within the culture of disadvantaged children, certain terms, items, and objects, function and location of objects have different connotations than usually ascribed them in middle class homes. Teacher awareness to these culturally manifested differences seems imperative.
Boys demonstrated a higher level of concept development and understanding than girls. Between sample groups, among sample members, and between sexes, there were marked differences regarding levels of knowing and comprehension. The general achievement of sample members on the test and observations of the investigator tend to indicate that disadvantaged children have more information and understanding concerning social studies concepts than they are presumed to have. This does not mean, however, that disadvantaged children have a fully developed fund of knowledge or that they do not have misconceptions regarding the social studies concepts included in the test instrument.

Objective 4: To seek information which may assist in determining whether or not planned pre-school experiences significantly increases, the probability of deprived children more capably dealing with curricular expectations at the first grade level.

It appears that children with longer periods of exposure to pre-kindergarten programs have greater probability of succeeding in academic expectations of the school than do children who have experienced a more limited pre-school program. References cited in Chapter II (D. Russell, J. Piaget, M. Almy) indicated that levels of concept attainment correlate highly with probable success in school. Concept development inferred skill development, factual information, language facility, and understanding. These are essential to successful academic achievement.

Data from the study showed that the sample groups with twenty-six weeks of pre-kindergarten achieved a higher level of concept development than the sample group with only eight weeks of pre-school. It is, therefore, postulated that the probability for success in school is greater among children from one sample group (extended pre-K) than from the other (limited pre-K),
and that the length of the pre-kindergarten experience is an important determinant regarding the probability of future school achievement.

Objective 5: To furnish data which may be utilized in ascertaining whether or not planned pre-school experiences for children of deprived environments produce a significant carry-over value into first grade with respect to concept development and/or mental operations.

Evidence from data analysis and group comparisons showed that children who participated in the twenty-six week pre-kindergarten consistently achieved higher in a test designed to measure concept development than children who were in the eight week pre-school program (not statistically significant). The results of the study were determined six months after children in the sample groups had entered first grade. This fact suggests that pre-kindergarten effects on concept development do carry over to and are measurable at the first grade level.

Objective 6: To develop an instrument which will discriminate and differentiate levels of concept development and mental operation utilization among disadvantaged children at the first grade level with regard to social studies concepts.

Generally, this objective of the study was fulfilled. The test had a reliability coefficient of .80 which indicated that test items were relatively homogeneous and that the test itself had an acceptable level of internal consistency. The fact that test results showed differentiated levels of concept attainment among the members of sample groups and consequently, among sample groups indicated that the test was useful in discriminating levels of concept development among disadvantaged children. Although there were no significant differences among sample groups with reference to mental operations, there was a significant difference between
sexes regarding this component of the test instrument. This finding showed that the test satisfactorily discriminated varying levels of mental operation utilization among sample members. Suggestions for modifications of the test to improve its effectiveness as a measurement instrument were presented previously in the text of the paper.

RECOMMENDATIONS

The completion of a research study seems to pose the question "So what?" or "What then?" The response to these and other similar questions is presented in this paper in the form of recommendations. These recommendations reflect not only the results of the study but also an integrated perspective encompassing selected aspects of the broader problem of pre-kindergarten education for the disadvantaged. The recommendations of this study are:

a) Strive to achieve general agreement upon goals and objectives of pre-kindergarten programs for the disadvantaged.

Present programs at the pre-kindergarten level appear to represent two differing philosophical positions: one position concentrates upon the child as a totality and emphasizes social and emotional aspects of growth; the other position focuses upon academic achievement and stresses a highly structured learning environment oriented towards intellectual development. It seems that the best of these two types of programs is essential for maximum individual growth and development among disadvantaged children. Emotional and attitudinal learning is essential to cognitive learning.

b) Provide for sequential educational experiences following pre-kindergarten. Articulation between pre-kindergarten and the early grades
of the elementary school requires adaptive, modifiable, and flexible pro-
gramming.

Changes in behavior manifested in the forms of intellectual growth, skill development, attitudinal orientations, or socialization patterns need to be encouraged by and complementary to subsequent educational experiences. The educational process depends upon the utilization of and capitalization on previously acquired gains and achievement. Pre-school programs by themselves cannot adequately meet the long-term needs of deprived children. Deutsch states that specialized considerations for the disadvantaged are necessary at least through the third grade and that only specifically planned programs can the stability of progress be assured.¹

Knoll, in discussing Deutsch's position, remarks that "the best pre-school program can do more harm than good if children don't have an appropriate kindergarten into which they can step--and if the early grades are not designed to carry through what was begun in the pre-school program."²

c) Identify basic concepts for incorporation into the social studies curriculum which are representative of the structural characteristics of the social sciences and which are considered to be essential to learning and living in contemporary society.

Current thinking of prominent educators and psychologists places considerable importance on conceptual development, indicating the relevance of conceptual attainment to the organization of knowledge and to the processes for the utilization of information. The growing accumulation

of knowledge and the demands of present day society strongly emphasize the need for effective learning and employment of knowledge. Intellectual structuring in the form of concept development and its attendant skills appears to be one means of meeting these requirements.

d) Make every effort to assist teachers who teach the deprived to know and understand disadvantaged children.

It is essential that teachers have knowledge of children's cultural backgrounds, their family, their experiences, and their needs if educational programs are to be worthwhile for and meaningful to children for whom special experiences have been designed. Through knowledge of this kind, teachers may determine children's levels of growth, establish priorities, and structure an educational program to most appropriately and most effectively meet individual and group needs. Without this type of information, because of the unique character of the problem, both teachers and programs would likely deal with vague generalities than with the particulars which the situation seems to demand.

e) Endeavor to employ and develop teaching methods which make learning significant to children.

Educational programs and teaching methodologies concerned with the education of disadvantaged children, it appears, need to rely heavily on the experiential component of learning.

Experiences provide the raw data from which impressions are gained and out of which concepts are formed. The product of concept development and the processes by which this product comes into fruition are essential to the accumulation of knowledge and to learning. According to the literature, the emphasis of experience should be placed on breadth and variation rather than upon indepth concentration in a given area or upon
a few delimited topics. The importance of experience to intellectual development is seen in the writings of persons such as D. Russell, M. Almy, J. Piaget, and others.

f) Encourage continued and comprehensive research in the area of the disadvantaged. Where feasible, research studies dealing with the educational concerns of disadvantaged children should be of an experimental nature and be carried out with the employment of experimental research designs.

Experimental research designs permit the control and manipulation of relevant factors. Controlled experiments yield specific types of data and lend themselves to replication. There remains much that is not known regarding the perceptions which the disadvantaged have of their world, the materials which are most suitable to their special learning needs, the methods which are most appropriate for their styles of learning and most relevant to their background, and the multitude of environmental factors which impinge upon their daily lives and relate directly to school learning.

Research studies regarding the disadvantaged are many, differing in magnitude and dimension, and including a broad range of interests from maternal relationships between mother and child to teacher education programs at the university level. Through the investigation of influences of preschool programs upon concept development and certain mental processes, the need for further research has become apparent. In addition to the hypotheses proposed earlier in this chapter, suggestions for further research are as follows:

a) Duration of pre-school experiences. Studies need to be conducted not only to determine the length of time required to effect maximum educational benefits for deprived children but also to ascertain how long such experiences must be in order to assure and maintain potential intellectual
growth. Other research studies are needed to evaluate short term pre-school experiences for possible negative effects. Such effects may create a psychological disruption for the child and be the resultant consequence of a child being exposed briefly to a school culture which is discontinuous with his own and being returned to his own culture without continued psychological support or without an adequate amount of time and experience to permit the accommodation of new and different learnings. There is the possibility that brief pre-kindergarten programs create an inverse relationship between experience and learning, that learning may be retarded rather than enhanced.

b) Learning materials. There is a need to develop and evaluate various kinds of learning materials which will most effectively bring about desired learning not only in the content of the social studies but also in other curricular areas in the elementary school. It is commonly agreed that deprived children require materials which relate to their ethnic background and which are designed to accommodate particular learning styles.

c) Teaching methods. Continued investigations are essential in the area of teaching methodologies, techniques, and procedures which relate to the learning styles of the deprived, which capitalize on his strengths and capabilities, and which recognize and accommodate his limitations. Differences among disadvantaged children with respect to experiences, verbal fluency, language patterns, sources and degrees of knowledge, and motivation seem to require different teaching approaches which need to be documented by empirical and research evidence.

d) Longitudinal and short term effects. There is a need for experimentally designed studies to evaluate long-term and short-term influences of pre-kindergarten experiences regarding all phases of a child's development (self concept, poor relationships, attitudes, skills, and understandings).
e) Sequence of learning experiences. Inquiries regarding the appropriate sequence of educational materials and activities at the pre-kindergarten level, and, perhaps more importantly, at kindergarten and first grade levels are imperative. Such studies, hopefully, would provide useful and valuable information for curriculum planning and development.

f) Measurement instruments. Reliable and valid test instruments are needed by teachers as diagnostic tools to identify individual and group strengths and weaknesses and as measurement devices to determine levels of achievement and teacher effectiveness.

The results of the study have shown, among other conclusions, that children who attend pre-kindergarten for different durations of time there is a quantitative achievement variation between them, and that this achievement differential tends to favor those children who have had pre-school experiences for a longer period of time. More importantly, the findings of the investigation also indicated that children without pre-kindergarten experience achieve at a higher conceptual level than those who have had preschool experience.

The reason(s) for this has (have) not become apparent within the context of this study. However, the determination or explanation of this particular study result is obvious. It appears that pre-school programs in and of themselves in their current state cannot accomplish the educational tasks for which they have been designed and to which education in general is committed. Only through additional research and continued professional effort of those concerned with the education of young disadvantaged children will insights into and resolutions for this problem be forthcoming.
To: Selected elementary school principals

From: Joseph L. Davis (Assistant Superintendent, Special Services)

Subject: Pre-kindergarten evaluation

Date: November 10, 1967

Within the last year, there has been a growing body of literature on the carry-over value of pre-kindergarten (or Head Start) programs. We frequently are asked about the long-range effects of the early pre-kindergarten projects conducted by the Columbus Public Schools. Unfortunately, we do not have research data on hand to use as a basis for responding to such questions.

Now, we are confronted with an opportunity to have this subject researched in a competent manner. Mr. Bruce Cobbs, a doctoral candidate at Ohio State University, has developed a research design that has been approved both by university authorities and myself.

As a preliminary step to launching his study, Mr. Cobbs needs to have a complete roster of all present first-grade pupils in your school and others that had a pre-kindergarten project during the 1965-66 school year and/or the summer of 1966.

Will you please see that such a roster is prepared on the attached forms for each first-grade section presently in your building. If you have any split classes involving first graders, only the names of first graders are to be listed.

You may proceed as you deem advisable in having these class rosters prepared.

The completed rosters are due in my office by 5 p.m. on Tuesday, November 21.

I shall appreciate your cooperation in this matter.
First Grade Class Roster

1967-68 School Year

School ___________________________ Teacher ___________________________

Please complete a separate class roster for each first grade teacher.
Check ( ) column appropriate for each child.

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<tr>
<th>Pupil's Name</th>
<th>Attended Kindergarten</th>
<th>Attended Pre-Kindergarten</th>
<th>Length of Pre-Kindergarten Experience</th>
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APPENDIX B

COVER LETTER AND PROFESSIONAL JUDGMENT QUESTIONNAIRE
Dear

Educational programs currently being utilized to provide compensatory educational opportunities for culturally disadvantaged children carry with them an inherent need for evaluation and improvement. A study is being undertaken with the consent and permission of The Columbus Public Schools to investigate the influences of pre-kindergarten experiences upon disadvantaged children at the first grade level. The study is concerned with the curricular area of the social studies.

Your professional experience and assistance is needed to determine a representative sample of social studies content used at your particular grade level which, in turn, will be utilized in the development of the test instrument. Secondly, your professional judgment is needed to consider the type of behavioral performances disadvantaged children are likely to display upon attaining various levels of achievement of this content.

The test instrument will consist of a set of pictures selected to represent social studies concepts identified with the instructional program at your grade level. Accompanying each set of pictures will be a set of corresponding questions structured to solicit the level of understanding and knowledge of the disadvantaged child. The instrument will be administered by means of a personal interview with each child selected for the study. The response (behavioral performances) will be primarily non-verbal in nature and require, basically, a "point to" identification of certain characteristics and relationships represented in the picture series.
The social studies are defined in the study quite broadly, and are stated to be "that aspect of the curriculum which deals with man's relationship to man and to his total environment." Within the context of this definition, the enclosed questionnaire is being used to identify social studies objectives and content which you consider to be important to your grade level of instruction and to which instructional time is given.

Your response to the questionnaire will be held in confidence and will be used for the single purpose of validating the content incorporated into the test instrument.

May I extend my personal gratitude to you for providing an important component to this study.

Cordially yours,

H. Bruce Cobbs

HBC/dlr
PROFESSIONAL JUDGMENT QUESTIONNAIRE

The broad and overlapping nature of social studies learnings at pre-kindergarten and first grade levels makes specific identification of instructional objectives oriented towards this curricular area a formidable task, and one which may be accomplished, in this instance, only by soliciting the judgments of qualified persons who are directly involved with specific teaching responsibilities.

The questionnaire consists of two components. One component is a list of instructional objectives which have been drawn from curriculum materials and guides of your school system and which tend to be representative of pre-kindergarten and first grade programs at the local level. The second component is a list of behavioral performances which, depending upon the degree of successful achievement, will aid in determining levels of knowledge and concept development of disadvantaged children.

Each of these, the social studies oriented objectives and the behavioral performances, needs your careful consideration and appraisal.

Directions:
1. Read each item carefully.
2. Consider each item according to the five point scale provided and circle the number which most accurately reflects your professional judgment.
3. Rate each objective according to the degree to which it is appropriate or relevant (in terms of instructional time given to it) to the grade level of your present teaching assignment.
4. Rate each behavioral performance according to the degree to which it is appropriate to or representative of instructional emphases of social studies content at your grade level of instruction.
5. Make comments, recommendations, or criticisms of the objectives or behavioral performances which would more clearly define or delineate social studies learnings at your grade level.
6. Return the completed questionnaire unsigned in the enclosed envelope by Wednesday, November 29, 1967.
OBJECTIVE: To gain greater knowledge and fuller understanding of the family and the roles of family members.

Identification behavior: Children in attaining this objective should be able to identify, within reason, pictures of:

a. Mother and Father roles:

1. Things which mother uses to do her work around the house
   Teacher comments:

2. Things which mother uses in cooking and preparing meals

3. Housekeeping chores which mothers do in the home

4. Jobs which mothers (women) do outside the home to earn money

5. Chores or tasks which fathers might do around the home

6. Jobs that fathers (men) do to earn money for food and clothing
   Teacher comments:

b. Child's role:

1. Things which a child can do to help around the house

2. Things which a child does in taking care of grooming and personal needs

3. Children who are happy/sad

4. Activities which show safety practices in playing
   Teacher comments:

c. Family activities:

1. Families doing things together

2. Ways some families travel

3. Persons who usually make up a family

4. Family activities which show work and recreation
   Teacher comments:
OBJECTIVE: To gain greater knowledge and fuller understanding of the home.

Identification behavior: Children in attaining this objective should be able to identify, within reason, pictures of:

a. Household furnishings:

1. Household items which are generally used in the kitchen
2. Household items which are generally located in the bedroom
3. Household appliances which operate by electricity
4. Household items such as radio, TV, lamp, telephone, clock, refrigerator
5. Tools which are commonly used around the house to fix things
6. A thermometer: tells us how warm or cool it is

Teacher comments:

b. Foods:

1. Common fruits and vegetables
2. Foods which grow on trees; those which grow in or near the ground
3. Foods which come to us from places far away
4. Foods which are seasonal

Teacher comments:

c. Persons who provide services to our home:

1. Doctor, nurse, postman, garbage collector, breadman, milkman, carpenter, painter, mason, electrician

Teacher comments:

d. Other:

1. Kinds of homes in the country, suburban, urban areas
2. Buildings where people work as compared with buildings where people live
OBJECTIVE: To gain greater knowledge and fuller understanding of the school.

Identification behavior: Children in attaining this objective should be able to identify, within reason, pictures of:

a. Persons:
   1. Persons in school who help to provide a service for children
   2. Teachers engaged in various activities with children

Teacher comments:

b. Children's activities:
   1. Different activities children do in school with the teacher
   2. Things which children do for/with other children
   3. Safety practices coming, during, and leaving school

Teacher comments:

c. Objects and equipment:
   1. Objects which help children learn (books, map, globe, projectors and films...)
   2. Tools and equipment children use in school (scissors, crayons,....)
   3. A library: a collection of books

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OBJECTIVE: To gain greater knowledge and fuller understanding of the neighborhood.

Identification behavior: Children in attaining this objective should be able to identify, within reason, pictures of:

a. Persons who:

1. Bring letters and packages to our home
2. Bake bread, cookies, and cakes
3. Help keep our city clean
4. Help fix our streets
5. Sell meat, food, groceries
6. Put out fires
7. Help people who are lost
8. Help people in accidents
9. Help people cross the street
10. Work out of doors
11. Work indoors

Teacher comments:

b. A mailbox where letters are mailed
c. A street light which gives light at nighttime
d. A sewer where water goes after a rain or snow
e. A fire plug where firemen hook on hoses
f. A fire alarm where fires are reported/firemen are called
g. A power line which brings electricity to our house
h. A stop sign/stop light which tells cars when to stop
i. A forest or park where there are many trees and animals
j. Vehicles of service people: firetruck, mailtruck, ambulance, police car
k. A park with play and picnic facilities
l. A supermarket where people buy groceries
m. Children at home, school, or park

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<td>8. Help people in accidents</td>
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<td>Teacher comments:</td>
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<td>b. A mailbox where</td>
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<td>letters are mailed</td>
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<td>c. A street light which</td>
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<td>gives light at nighttime</td>
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<td>where there are many</td>
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<td>j. Vehicles of service</td>
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<td>people: firetruck,</td>
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<td>police car</td>
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<td>k. A park with play and</td>
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<td>picnic facilities</td>
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<td>l. A supermarket where</td>
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<td>people buy groceries</td>
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<td>m. Children at home,</td>
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OBJECTIVE: To gain greater knowledge and fuller understanding of a broadened environment.

Identification behavior: Children in attaining this objective should be able to identify, within reason, pictures of:

a. Means of transportation:

1. Travels or goes on water (lake, river, ocean)  
2. Travels on highways, streets, roads  
3. Travels in the air/sky  
4. Travels on rails of steel, or track  
5. Is associated with a pilot  
6. Is associated with an engineer  
7. Carries a large number of people  
8. Carries things which are heavy and big  
9. Used by children and parents to travel  
10. Moves by rowing/paddling  
11. Moves by the wind  
12. Runs on wheels  

Teacher comments:

b. Machinery which:

1. Helps a farmer do his work  
2. Helps to build tall buildings  
3. Helps to move earth and build roads  

Teacher comments:

c. Animals which:

1. Live on a farm  
2. May be seen in a zoo  
3. Are used for meat  
4. Are wild/live in a woods or forest  
5. Are tame/cared for by people  
6. Give us wool for clothing  
7. Give us bacon, ham, sausage  
8. Give us eggs  
9. Give us milk  
10. Live in trees and eat acorns/nuts
OBJECTIVE: No. 5 (cont.)

11. Live on a dairy farm
12. Live in water
13. Make nests in trees and lays eggs
14. Are dangerous
15. Are a sign of springtime

Teacher comments:

d. National observances which:

1. Are symbolized by a Christmas tree, Pilgrims and harvest, witches and masks, hearts and valentines
2. Is designated by the giving and receiving
3. Is designated by the giving of thanks and the recognizing of our Pilgrim forefathers
4. Is designated by the wearing of mask and scary costumes
5. Come in the Winter: Christmas
6. Come in the Fall: Thanksgiving, Halloween

Teacher comments:

e. Seasonal influences which:

1. Show activities associated with summer
2. Show activities associated with Winter
3. Show activities associated with spring
4. Show activities associated with fall
5. Show clothes worn in warm weather
6. Show clothes worn in cold weather
7. Show clothes worn in rainy weather

Teacher comments:
**OBJECTIVE:** No. 5 (cont.)

f. Prominent persons and locations:

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<td>President Johnson</td>
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<td>Cassius Clay</td>
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<td>George Washington</td>
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<td>Abraham Lincoln</td>
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APPENDIX C

TEST INSTRUCTIONS
General Test Instructions

Content of the Test

The test consists of a series of pictures which have been selected to represent certain social studies concepts incorporated in pre-kindergarten and first grade instructional programs of the Columbus public schools.

Each series of pictures is accompanied by a set of correlated questions designed to differentiate varying levels of concept development among sample groups of disadvantaged first grade children.

The emphases of the test is focused on three major topical areas: home, neighborhood, and community. The test is also designed to sample three fundamental mental operations essential to the process of conceptualization: identification, relation, and classification.

Scoring

One point will be given for each test item. Questions requiring multiple responses (classification items) will be scored according to the fractional part of the answer which is correct. Credit for classifications may be one-fourth, one-third, one-half, or 1 depending upon the correctness of the responses. Questions will be graded according to the sequence of responses. For questions requiring one response, only the first response will be considered. For questions necessitating multi-answers, only those responses which have an ordinal position equivalent to the required responses will be accepted. For example, if a question requires 2 responses, only the first two answers a child gives will be considered.

Directions

1. This is not a timed test. It is estimated that the time required for the administration of the test should be approximately 20-30 minutes.

2. Administer the test by means of a personal interview with each child selected for the study.

3. Take the first few minutes of interview time to establish rapport with the child.

4. Interview each child in a room which is apart from the regular classroom and as free from outside disturbance and noise as possible.

5. Read all questions as they are stated. Do not alter or rephrase their written form. No question should be read to a child more than twice. Queries of the child relative to an interpretation of test pictures or questions should be discouraged and not answered.

6. Respond to the child's responses in an accepting manner. Use such
expressions as "yes," "good," a nodding of the head, a smile, or other similar gestures.

7. Provide an adequate amount of time for the child to look at each series of pictures before asking the test questions.

8. Encourage each child to respond to each question even though he shows uncertainty and reluctance. Use expressions such as "Try it." or "Which do you think it is?"

9. Ask the child to respond to test questions in a "pointing to" manner. Instructions such as "show me," "put your finger on" or "point to" may be used.

10. Record all responses a child makes regardless of their correctness or incorrectness. Record them in the sequence given. Use the Individual Response Sheet provided.
Instructions: Introducing the Test

Introduce the Test

"I would like to play a picture game with you. In this booklet are different kinds of pictures for you to look at. After you have looked at the pictures I will ask you some questions about them."

"All you need to do is to point to the picture or pictures which best answer the questions which you are asked. For some questions you may need to point to only one picture; for other questions you may need to point to two or three pictures: This depends upon what the questions ask for."

"Let's try the first set of pictures. Look at each of the pictures."

Turn to Example 1 and give the child sufficient time to look at all the pictures, then say:

a. "Point to the picture of pictures which show a tent." (Indicate acceptance of the child's response by saying "Good," "That's fine," "Yes," or by using some other recognition phraseology.

b. "Point to the picture or pictures which show a radio." (Indicate acceptance of child's response as in part a.)

c. "Point to the picture or pictures which show a lamp." (Indicate acceptance of child's response as in part a.)

"Listen to this next question very carefully."

d. "Point to the picture or pictures which show toys children play with."

If the child points to only one toy; explain that another picture in Example 1 is also a toy and that to answer the question completely both pictures of toys must be pointed to.

If the child points to both pictures of toys, indicate positive acceptance and explain that he was correct. Point out to the child that
previous questions for Example 1 required pointing to only one picture; the
questions about toys required pointing to two pictures.

"Let's do the next set of pictures."

(Continue to show acceptance and approval for response the child makes).

"Point to the picture or pictures which show":

a. a kitten
b. an orange
c. animals which are usually kept as pets by people who live in the
city
d. something used to make orange juice
e. something which comes from a chicken

Point out to the child that the question dealing with pets in Example 2
required pointing to two pictures and the other questions required pointing
to only one picture.

"The other sets of pictures are like the ones we have just done. For
some questions you need to point to only one picture; for other questions,
you need to point to two or three pictures."

On pages 1 and 2 of the body of the test if a child gives only a
single response to a multiple response question (p.1: 3, 5; p.2: 9, 11, 13),
encourage additional responses by such comments as "Is there anything else?"
"Is that all?" or "Do you see anything else?" This technique is utilized
only on pages 1 and 2 of the test to encourage multiple responses by the
child on subsequent questions.
APPENDIX D

EXAMPLE OF TEST PICTURE BOOKLET FORMAT
<table>
<thead>
<tr>
<th>Fireman and Fire Truck in Station</th>
<th>Service Station Attendant and Gasoline Pump</th>
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<tbody>
<tr>
<td>Nurse and Patient</td>
<td>Mailman with Mail Bag</td>
</tr>
<tr>
<td>Policeman Helping Children Cross the Street</td>
<td>Doctors in Operating Room</td>
</tr>
</tbody>
</table>

Test questions corresponding to picture booklet, page 6.

Point to the picture or pictures which show:
1. people who help us when we are sick.
2. someone who brings letters and magazines to our home.
3. someone who uses long hoses and ladders in his work.
4. people who work in hospitals.
5. someone who works in a post office.
6. someone who protects us from robbers or burglars.
7. people who wear uniforms in their work.
8. someone whose job it is to direct traffic.
9. someone who would help us find our way home if we were lost.
10. a service station.
11. the person who is called when there is a car accident.
12. people whose jobs may be very dangerous at times.
APPENDIX E

TEST INSTRUMENT
TEST INSTRUMENT TO
SAMPLE CONCEPT DEVELOPMENT

Page 1  Point to the picture or pictures which show:
1. carrots
2. strawberries
3. those things which are fruits
4. beans
5. those things which are vegetables

Page 2  Point to the picture or pictures which show:
6. something used to wash dirty clothes
7. a refrigerator
8. a faucet
9. things which use soap and water to do their jobs
10. an oven
11. things usually found in the kitchen
12. something used to keep food from spoiling
13. things mothers use in cooking meals
14. where frozen foods are kept

Page 3  Point to the picture or pictures which show:
15. something which tells how warm or cold it is
16. a sewing machine
17. those things called tools
18. something which helps wake up people in the morning
19. a thermometer
20. something which tells us the hours and minutes of the day
21. a wrench
22. things do not use electricity to make them work
Point to the picture or pictures which show:

23. someone mowing the lawn
24. a needle
25. jobs which mothers usually do around the house
26. a picnic
27. where a mother might use a thimble
28. things people do in the summer
29. someone golfing
30. a time or place when you might use napkins

Page 5

Point to the picture or pictures which show:

31. that it is cold outside
32. things children can do outside in the summertime
33. children having refreshments
34. a beach
35. something children can do after it snows
36. things children do in school
37. where you would find a lake
38. where safety rules are very important
39. a life guard

Page 6

Point to the picture or pictures which show:

40. people who help us when we are sick
41. someone who brings letters and magazines to our home
42. someone who uses long hoses and ladders in his work
43. people who work in hospitals
44. someone who works in a post office
45. someone who protects us from robbers or burglars
46. people who wear uniforms in their work
47. someone whose job it is to direct traffic
48. someone who would help us find our home if we are lost
49. a service station
50. the person who is called when there is a car accident
51. people whose jobs may be very dangerous at times

Page 7  Point to the picture or pictures which show:

52. children learning from books
53. a teacher helping children learn
54. a child learning about numbers
55. children helping one another
56. a child taking care of himself at snack time
57. children learning by looking at pictures

Page 8  Point to the picture or pictures which show:

58. a factory
59. a stream
60. things which you would find in the country
61. an apartment house
62. a forest
63. things which you would find in the city
64. a farm
65. a supermarket

Page 9  Point to the picture or pictures which show:

66. things which travel on water
67. things in which a large number of people can ride
68. things which travel on streets and highways
69. things which travel in the air
70. the thing which carries the most people
71. a helicopter
72. the thing which travels the fastest
73. an ocean liner
74. things which are usually seen at an airport
75. a space craft or rocket
76. something which moves by rowing
77. things which move by jet engines

Page 10 Point to the picture or pictures which show:
78. something which travels on rails
79. things which use bridges
80. an expressway or freeway
81. a bridge
82. things which travel on streets and highways
83. something which uses wind to make it move
84. things which carry big packages and boxes
85. something most people use when they go places or travel
86. a sailboat
87. something which carries a large number of passengers

Page 11 Point to the picture or pictures which show:
88. a zebra
89. animals which are wild and may be seen in a zoo
90. animals which have tusks
91. animals which give us meat
92. the largest animal
93. animals which are tame and may be seen on a farm
94. the smallest animal
95. animals which farmers take care of and feed
96. an animal which gives us bacon and ham

**Page 12** Point to the picture or pictures which show:
97. a robin
98. animals which give us wool for clothing
99. a racoon

**Page 13** Point to the picture or pictures which show:
100. an animal which is called "king of the beasts"
101. a colt
102. animals which are usually seen in a zoo
103. a calf
104. animals which are usually seen on a farm
105. animals which live in far away places
APPENDIX F

INDIVIDUAL RESPONSE SHEET
INDIVIDUAL RESPONSE SHEET

Name ____________________________  Teacher ____________________________  Composite Score

School ____________________________  Classification ________________________

Column A -- Record Pupil Responses
Column B -- Correct Response for Scoring Purposes
Column C -- Record Credit for Correct Responses

Scoring: One point for each correct response  Total

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SELECTED BIBLIOGRAPHY
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**DISSERTATIONS**


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