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AUTHOR	Reese, Clyde; Morrow, Robert O.
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ABSTRACT

In a study of preschool child development programs, the purposes were two-fold: (1) to determine the effects of socioeconomic mix upon the cognitive, social, and language development of disadvantaged children, and (2) to determine the relative effects of two percentages of socioeconomic mix upon the cognitive, social, and language development of disadvantaged children. Using the pre-test, post-test experimental design with several testing methods, the analysis of variance and covariance were the major statistical tools used in the analysis of the data in addition to some a priori comparisons between treatment means on the results of the analysis of variance. The trends showed considerable support for the positive effects of socioeconomic mix. Included in the conclusions are: (1) the positive effect on the cognitive development, with less positive effects on verbal skills than other areas of cognition; (2) an increase in interactions between the subject and adults, and a decrease in those between subject and peers as the level of socioeconomic mix increases; (3) the reverse of such interactions as the level of socioeconomic mix decreases; (4) positive effects on the social competency under problem and stress conditions; and (5) positive effects in the development of social directed behavior and less ego directed behavior. (Author/LH)

SOCIOECONOMIC MIX EFFECTS ON DISADVANTAGED CHILDREN IN PRESCHOOL CHILD DEVELOPMENT PROGRAMS

CLYDE REESE, Ed. D.
ROBERT O. MORROW, Ph. D.

In Cooperation With

THE ARKANSAS RIVER VALLEY AREA COUNCIL

ROBERT L. ADKISON, Executive Director

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ABSTRACT

The basic purposes of the study were two-fold: (1) to determine the effects of socioeconomic mix upon the cognitive, social, and language development of disadvantaged children, and (2) to determine the relative effects of two percentages of socioeconomic mix upon the cognitive, social and language development of disadvantaged children. One hundred sixty-eight disadvantaged pre-school children enrolled in twelve Head Start Child Development Centers in rural West Central and Western Arkansas under the supervision of the Arkansas River Valley Area Council were involved in the study which covered the period between September 1, 1970, until May 31, 1971.

Three experimental groups were identified: Experimental I (50-50 ratio of socioeconomic mix), Experimental II (75-25 ratio of socioeconomic mix in which 75 per cent were disadvantaged), and a Control Group (100 per cent disadvantaged). Three major hypotheses relative to the effect of socioeconomic mix upon the cognitive, social, and language development on the disadvantaged children were tested using the pre-test, post-test experimental design. The analysis of variance and covariance were the major statistical tools utilized in the analysis of the data in addition to a selected number of a priori comparisons between treatment means on the results of the analysis of variance.

The instruments utilized in the collection of the data were the Pre-School Inventory, the Peabody Picture Vocabulary Test, the Test of Basic Experiences, the Cincinnati Autonomy Test Battery, the Kansas Social Interaction Observation Procedure, and audio tape recordings of verbal responses.

Analysis of the data revealed that, although the data did not conclusively support the major hypotheses under consideration at the .05 level of significance in all cases, the trends showed considerable support for the positive effects of socioeconomic mix. Eleven F ratios were significant at the .05 level, all in favor of the experimental groups, while two other variables were approaching significance yielding F ratios beyond the .10 level of confidence.

Replications of the study are needed to conclusively determine the effects of socioeconomic mix, however, because of the consistency of the trends noted in the analysis the following conclusions were drawn:

(1) Socioeconomic mix has a positive effect upon the cognitive development of disadvantaged children, with less positive effects on verbal skills than other areas of cognitive development.

(2) As the level of socioeconomic mix increases there is an increase in interactions between the subject and adults and a decrease in interactions between subject and peers.

(3) Conversely, as the level of socioeconomic mix decreases there is a decrease in interactions between subjects and adults

and an increase in interactions between subjects and peers.

(4) Socioeconomic mix had a positive effect on the social competency of disadvantaged children, i.e., interactions with adults under problem and stress situations.

(5) Socioeconomic mix has a positive effect in the development of social directed behavior and less ego directed behavior.

(6) Of the two levels of socioeconomic mix employed in the study, the data supported the 75-25 disadvantaged-advantaged ratio moreso than the 50-50 ratio.

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Last, but certainly not least, the authors are grateful for the support given by the officials of State College of Arkansas. It should be recognized, however, that the materials contained in the report and any errors or shortcomings are the sole responsibility of the authors.

Clyde Reese
Robert O. Morrow

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CHAPTER I

INTRODUCTION

One of the most serious problems confronting American society is the large number of children who enter the public school systems with inadequate pre-school educational and social experiences to successfully cope with school experiences. Although the problem is not totally identifiable with any specific segment of the American society, the majority of these children come from the so-called poor class. These children have been labeled by many terms in the literature, but for purposes of this report they shall be referred to as the disadvantaged. The term disadvantaged will be defined later in this chapter.

Two major dimensions which contribute to the inability of many disadvantaged children to successfully participate in the public schools are easily identified: the status of the child's physical well-being and the quality of environmental experiences which prepare the child for successful academic experiences. In reaching for solutions to the problems of low achievement the concept of Head Start was created. Originally the Head Start programs were established for five- and six-year-old disadvantaged children the summer before they were scheduled to enter the public schools in the fall. The basic goals of the Head Start programs were reducing the health problems and increasing the quality

of environmental experiences of the disadvantaged children.

In the beginning the major emphasis of the Head Start programs were directed toward the child's physical well-being. With medical and dental services as well as various other kinds of health programs, many disadvantaged children were able to enter the public school systems in much better health than their predecessors.

It became apparent, however, that in order to provide quality environmental experiences, which had a chance of changing the behavior of disadvantaged children, a greater and more concentrated effort was needed. As a result many Head Start programs were approved to expand their operations to year-round programs and to admit three- and four-year-old disadvantaged children as well as five- and six-year-olds. The Arkansas River Valley Area Council was one of those agencies approved for year-round operations and the agency has been operating such programs for the last four years.

Because the target population of Head Start was the lower socioeconomic stratum, and their children, criteria determining the eligibility for enrollment centered around family income as it related to size of family and rural and urban classifications. Some flexibility was allowed, in that ten per cent of the children admitted by any community action agency could be above the family income guidelines. In actual practice, however, the overwhelming majority of

those children admitted were so narrowly above the guidelines that they could be classified as disadvantaged.

The net result of these developments was to continue to isolate disadvantaged children from the rest of society, although there are theoretical considerations and empirical data to support the position that a significant dimension of the learning process is the interaction among and between children. The isolation of the disadvantaged children was augmented when the community agencies were encouraged to employ people to operate the Head Start Centers from the disadvantaged population.

If the evidence available tends to support the position that a significant factor in learning is that children learn from one another, programs which tend to isolate a particular group from the total population from which it comes could be viewed as not providing optimum programs that would otherwise be possible. A significant question is, therefore, would pre-school Head Start Child Development programs be more effective if heterogeneous mixings of children were approved. Some specific questions arise under these conditions: (1) Would disadvantaged children show greater increments in learning under conditions which permit for heterogeneous groupings than when they are more homogeneously grouped; (2) What effects would such groupings have on the so-called advantaged child under heterogeneous grouping conditions; and, (3) If heterogeneous groups are more effective than

homogeneous groups, what percentage of heterogeneous groupings tend to optimize learning? It is the first and third questions to which this study is directed.

The Problem

There were two basic purposes around which this study centered: (1) to analyze the changes that occur in the cognitive, social, and language development of disadvantaged children under conditions where there is opportunity for prolonged interaction with advantaged children, and (2) what percentage of disadvantaged-advantaged mixing provides for optimal improvement of the cognitive, social, and language development of disadvantaged children?

Definitions

Identified below are the operational definitions of the key terms utilized in the study:

1. Disadvantaged: The term refers to those children who are eligible under the family income guidelines to enroll in Head Start Child Development programs.

2. Advantaged: The term refers to those children who are not eligible under the family income guidelines to enroll in Head Start Child Development programs.

3. Cognitive Development: The term refers to those dimensions of development associated with perceiving and knowing, and for the purpose of this study are assessed by: (1) Caldwell Pre-School Inventory (PSI), (2) Peabody Picture

Vocabulary Test (PPVT), (3) the Cincinnati Autonomy Test Battery (CATB), and (4) the Test of Basic Experiences (TOBE) (administered only to those children who reached the age of five by January 1, 1971).

4. Social Development: The term refers to that dimension of development associated with social skills in interpersonal relationships and is measured by the Kansas Social Interaction Observation Procedure (SIOP).

5. Language Development: The term refers to those aspects of language development relative to facility, complexity of sentence structure and usability, as measured by tape recordings of spontaneous conversations between the subjects.

6. Head Start Child Development Center: The term identifies the physical facility in which there are multiple classrooms.

7. Experimental Group I: The term refers to those classrooms in which there was fifty per cent disadvantaged and fifty per cent advantaged children enrolled.

8. Experimental Group II: The term refers to those classrooms in which there were seventy-five per cent disadvantaged and twenty-five per cent advantaged children enrolled.

9. Control Group: The term refers to those classrooms in which there were one hundred per cent disadvantaged children enrolled.

Hypotheses

There were three basic null hypotheses tested in the study:

1. There will be no significant differences between the increment in cognitive development of the disadvantaged children in the experimental and control groups.

2. There will be no significant difference between the increment in social development of the disadvantaged children in the experimental and control groups.

3. There will be no significant difference between the increment of language development of disadvantaged children in the experimental and control groups.

CHAPTER II

DESIGN AND PROCEDURES

Introduction

The Head Start Child Development Centers under the supervision of the Arkansas River Valley Area Council (hereafter referred to as ARVAC) were the Centers involved in this study. ARVAC has as one of its major responsibilities the operation of year-round Head Start Child Development Centers covering a seven county area including approximately 600,000 square miles of territory. The area encompassed by ARVAC is rural with no community, in which a Head Start Center is located, exceeding 10,000 population. The disadvantaged living in the area are predominately white, although there are a number of blacks located in the Morrilton, Clarksville, and Paris communities. When this study was initiated ARVAC had twenty-four Head Start Child Development programs in operation.

Only in one community served by ARVAC is there an institution of higher learning and that institution is a church related private college. The basic source of income for the population within the ARVAC region are middle size and small industrial plants and farm oriented work. The communities are strikingly homogeneous in terms of demographic characteristics. Therefore, family income yields a reasonably valid picture of socio-economic status.

The purpose of this chapter is to describe the design and procedures utilized in the study. A description of the Centers utilized in the study will be followed by a discussion of the rationale used in identifying the subjects for the study. The fourth section of the chapter describes the instruments used in the collection of the data, while the fifth section describes the methods by which the data were collected. The sixth section discusses the design employed in the analysis of the data.

Centers

For the purposes of this study, twelve Head Start Child Development Centers were chosen as the experimental Centers. Identified in Table I are the communities in which the Centers were located, the experimental classification of each center in the study, and the subjects in each of the design categories.

In Paris and Clarksville there were two Head Start Child Development Centers at different locations in the community. The Centers in each of these two localities were under the same supervision at the director level, but children in the two Centers were never in contact with each other during the time of the study. An arrangement was made to divide the Head Start Child Development Center at Morrilton into two Centers specifically for this study. The physical facility in Morrilton was formerly a junior high school building in

TABLE I

THE EXPERIMENTAL HEAD START CHILD DEVELOPMENT CENTERS

Community	Experimental Classification	Number
Morrilton	Experimental I	32
Paris	Experimental I	18
Clarksville	Experimental I	33
Danville	Experimental I	22
Ozark	Experimental II	25
Waldron	Experimental II	23
Dover	Experimental II	21
Booneville	Experimental II	26
Morrilton	Control	32
Clarksville	Control	26
Paris	Control	35
Ola	Control	26

which there were six classrooms and a lunch room. Three of the classrooms were identified as one Center and was classified as one of the Experimental I Centers in the study. Two classrooms were identified as one Center and was identified as one of the Control Centers. Procedures were set up such that the children from the two classifications were not together. Daily schedules were established to insure no contact between the children. Two parent groups were established, each having its list of officers and their meetings occurred at different times, again insuring the identity of the two Centers. As was true at Clarksville and Paris, the leadership at the director level was under the same supervision.

Sample

All the experimental Head Start Child Development Centers had been in operation prior to the initiation of the study. The common procedure of the Centers was to admit a child to the Center as a vacancy came open. In order to insure that a large number of children would be beginning at the time of the collection of the pre-test data, a freese on enrollments was made between July 1, 1970, and September 1, 1970. As a result, thirty-three disadvantaged children were admitted to the Experimental I Centers, thirty disadvantaged children were admitted to the Experimental II Centers, and forty-six disadvantaged children were admitted to the Control

Centers on September 1, 1970. The percentage of disadvantaged children admitted September 1, 1970, for each of the three groups were: Experimental I, 66 per cent; Experimental II, 64 per cent; and the Control Group, 65 per cent. No changes were made in the procedures employed by the Board of Directors in the selection of disadvantaged children. The Board of Directors of the Control Centers were instructed not to enroll any children above the income guidelines.

Also of major concern was the age distribution of the disadvantaged children who were to be the subjects of the study. An effort was made and a reasonable balance was obtained in the age distributions of the subjects between and within the experimental and control centers. Identified in Table II are the age distributions of the subjects in the experimental and control centers and the number of subjects according to age as of September 1, 1970, who were admitted on that date.

Because of the guidelines established which determine the eligibility for enrollment in the Head Start Child Development Centers, special permission to enroll advantaged children in excess of the 90:10 ratio was requested from the Regional Office of the Office of Child Development in Dallas, Texas. Once permission was obtained several sources were utilized in the recruitment of the advantaged children. Radio and newspaper announcements were the two major sources employed.

Interested parents were instructed to complete the applications that were used in the Centers for the disadvantaged. Prior to admission in the programs, an interview with a member of the research team was required. There were two major purposes for requiring the interview. The first purpose was to make sure that the child was reasonably normal in terms of mental and personal functioning. The second purpose was to impress the parents as to the importance of their children remaining in the program for the entire period covered by the study. Only those advantaged children were accepted who met this requirement and whose parents gave reasonable assurance that the children would remain in the program. Identified in Table III and Table IV were the number and percentage of disadvantaged and advantaged children enrolled in the Experimental I and Experimental II groups. Even though the guidelines allowed a 90:10 ratio of disadvantaged-advantaged children, the Control Centers enrolled only disadvantaged children, i.e., all children enrolled in the Control Centers were classified as disadvantaged children.

Of the fifty-four subjects in the Experimental I group, only four were withdrawn from the program during the year in which the study was conducted. There are small variations in the number of subjects tested on which all subjects were scheduled to be tested. These variations were due to absences and the tightness of the schedule in testing the subjects. One make-up testing period was scheduled for each Head Start

TABLE II

AGE DISTRIBUTION AND ENROLLMENT DATES OF THE DISADVANTAGED CHILDREN IN THE EXPERIMENTAL AND CONTROL CENTERS

Age	Exp. I	Exp. II	Control	No. Enrolled Sept. 1, 1970		
				Exp. I	Exp. II	Cont.
Three	8	10	10	8	8	9
Four	12	18	21	9	13	16
Five	29	19	36	16	9	21
Six	1	0	4	0	0	0
Totals	50	47	71	33	30	46

TABLE III

NUMBER AND PERCENTAGE OF DISADVANTAGED AND ADVANTAGED CHILDREN ENROLLED IN THE EXPERIMENTAL I CENTERS

Centers	Number of Disadvantaged	Number of Advantaged	Percentage of Disadvantaged
Morrilton	16	16	50
Clarksville	16	17	48
Paris	9	9	50
Danville	12	10	55
Total	54	52	51

TABLE IV

NUMBER AND PERCENTAGE OF DISADVANTAGED AND ADVANTAGED CHILDREN ENROLLED IN THE EXPERIMENTAL II CENTERS

Centers	Number of Disadvantaged	Number of Advantaged	Percentage of Disadvantaged
Ozark	17	7	71
Waldron	16	6	73
Dover	16	4	80
Booneville	19	5	79
Total	68	22	76

Child Development Center, and if a child missed both the regular and make-up dates he was eliminated as one of the subjects. The attrition rate was greater in the Experimental II group, with a total of fourteen subjects being withdrawn during the year. Therefore, fifty subjects comprised the Experimental I group, while forty-seven subjects were in the Experimental II group.

Instrumentation and Testing Procedures

Data were collected by means of the following: (1) the Pre-School Inventory, (2) the Peabody Picture Vocabulary Test, (3) the Cincinnati Autonomy Test Battery, (4) the Test of Basic Experiences, (5) the Kansas Social Interaction Observation Procedure, and (6) analysis of tape recordings of verbal interaction of the subjects. There were six research assistants and three faculty members comprising the research team involved in the collection of the data.

Because of the need for specialized training to administer and score the Cincinnati Autonomy Test Battery and the Kansas Social Interaction Observation Procedure, two members of the research team were assigned the responsibility for the collection of the data on each of the two instruments. Two other members of the research team were assigned the responsibility for obtaining the verbal recordings. All members of the research team participated to some extent in the collection of the data on the other three instruments.

Special meetings were held prior to the testing periods for the purpose of achieving uniformity in the administration of the instruments. With very few exceptions, the members of the research team pre-tested and post-tested the same children on the same instruments. All testing occurred between 7:30 a.m. and 11:30 a.m.

The Pre-School Inventory was chosen for this study because of its particular orientation toward the disadvantaged. As the author of the instruments states, the instrument was designed to "provide educators with an instrument that would permit them to highlight the degree of disadvantage which a child from a deprived background has at the time of entering school so that any observed deficits might be reduced or eliminated." As is implied in the above statement, the Inventory is designed for pre-school children ranging in age from three to six years.

The first edition of the Inventory contained eighty-four items which were subsequently reduced to sixty-four in the revised edition. It was the revised edition which was used in this study, the basic purposes being to measure the child's performance in such areas as: basic information and vocabulary; number concepts and ordination; concepts of size, shape, motion, and color; concepts of time, object class and function; visual motor performance; following instructions; and independence and self-help. The reader is referred to the test manual for a discussion of the theory on which the

instrument was based as well as its validity and reliability. No adjustments were made in the raw scores obtained on the instrument as has been done in some studies, for the age distributions in each of the experimental groups were fairly even.

The basic purpose of the Peabody Picture Vocabulary Test is, as stated by the author in the test manual, "to provide an estimate of a subject's verbal intelligence through measuring his hearing vocabulary." The instrument is designed for subjects ranging in age from two years six months to eighteen years. A discussion of the norms, validity and reliability of the test is contained in the test manual. The instrument was included in this study because of its emphasis on hearing vocabulary and for comparisons with the Pre-School Inventory which was aimed primarily at the disadvantaged.

The Test of Basic Experiences, General Concepts is designed primarily as a cognitive measure "to provide an increased understanding of the child and the class by providing an indication of how well a child's experiences have prepared him for his introduction to many of the scholastic activities that he will encounter." The instrument is published by CTB/McGraw-Hill. Five tests are available, the General Concepts Test, Mathematics Test, Language Test, Science Test, and Social Studies Test. Inasmuch as the General Concepts Test covers all the four subject matter areas and is particularly useful in a pre-school setting without a formal

academic structure, the General Concepts Test was chosen for use in this study. A discussion of the technical data related to the construction of the instrument is covered in the test manual.

The Cincinnati Autonomy Test Battery was chosen as one of the instruments to be used in this study because of its attempt to measure various aspects of cognitive behaviors not included in the conventional cognitive measures. As the author of the instrument states, "the instrument was designed to measure autonomous functioning in problem solving rather than focusing on the appropriate, the conventional and the quick response which is characteristic of most standard cognitive measures." Quoting from John Holt's book, How Children Fail, "the true test of intelligence is not how much we know how to do, but how we behave when we don't know what to do," which serves as the central theme around which his research was based. The reader is referred to the book, Cognitive Studies, Volume I, edited by Jerome Hellmuth for a discussion of the theory underlying the construction of the instrument and of its validity and reality.

The rationale underlying the development of the test and test materials were: (1) relevance to autonomy theory, (2) relevance to later childhood and adulthood, (3) emphasis on behavioral rather than oral responses, (4) attractiveness of the materials to children, (5) minimal verbal demands on the child, both in instructions and responses, and (6) checks

on the child's comprehension of instructions so that low scores will not be the result of not having caught on to the task.

The test provides scores on twelve basic variables which are identified and briefly described.

1. Curiosity: Tendency to explore, manipulate, investigate, and discover in relation to novel stimuli.
2. Innovative Behavior: Tendency to generate alternative solutions to problems.
3. Impulse Control: Tendency to restrain motor activity when the task demands it.
4. Reflectivity: Tendency to wait before making a response that requires analytic thinking, when the task demands it.
5. Incidental Learning: Tendency to acquire information not referred to in the instructional stimuli.
6. Intentional Learning: Tendency to acquire information specified in the instructional stimuli.
7. Persistence: Attention to a problem with solution-oriented behavior where the goal is specified.
8. Resistance to Distraction: Persistence, with distracting stimuli present.
9. Field Independence: Tendency to separate an item from the field or context of which it is a part.
10. Task Competence: Ratings of tendency to deal effectively with problems of many kinds.
11. Social Competence: Ratings of ability to work comfortably with adults.
12. Kindergarten Prognosis: Ratings of ability to do well in conventional kindergarten.

The Kansas Social Interaction Observation Procedure was chosen as the instrument to measure socialization in this study. The basic purpose of the instrument is designed to measure the frequency of verbal and non-verbal interactions between two or more persons during the subject's normal activities in the classroom setting. The instrument was designed to measure social interactions on 109 variables. For purposes of this study thirty variables were chosen for analysis.

The thirty variables are identified and briefly described as:

1. Verbal Interactions S and A: The frequency of verbal interactions between the observed child and an adult.
2. Verbal Interactions S and P: The frequency of verbal interactions between the observed child and a peer.
3. Nonverbal Interactions S and A: The frequency of nonverbal interactions between the observed child and an adult.
4. Nonverbal Interactions S and P: The frequency of nonverbal interactions between the observed child and a peer.
5. Verbal-Nonverbal Interactions S and A: The frequency of interactions containing <u>both</u> verbal and nonverbal cues between the observed child and an adult.
6. Verbal-Nonverbal Interactions S and P: The frequency of interactions containing <u>both</u> verbal and nonverbal cues between the observed child and a peer.
7. Total Verbal Interactions: The frequency of all verbal interactions between the observed child and another person.

8. Total Nonverbal Interactions: The frequency of nonverbal interactions between an observed child and another person.

9. Total Verbal-Nonverbal Interactions: The frequency of interactions containing <u>both</u> verbal and nonverbal cues between an observed child and another person.

10. ≤ S and A Interactions: The frequency of social interactions between an observed child and an adult.

11. ≤ S and P Interactions: The frequency of social interactions between an observed child and a peer.

12. Total Verbal Initiations by S: The frequency of verbal initiations made by the observed child.

13. Total Nonverbal Initiations by S: The frequency of nonverbal initiations made by the observed child.

14. Total Verbal Responses by S: The frequency of verbal responses made by the observed child.

15. Total Nonverbal Responses by S: The frequency of nonverbal responses made by the observed child.

16. S to A Initiations Responded to: The frequency of initiations made by the observed child to an adult that is responded to by the adult.

17. S to P Initiations Responded to: The frequency of initiations made by the observed child to a peer that are responded to by the peer.

18. A to S Initiations Responded to: The frequency of initiations made by an adult to the observed child that are responded to by the child.

19. P to S Initiations Responded to: The frequency of initiations made by a peer to the observed child that are responded to by the child.

20. Total Initiations Responded to: The frequency of initiations made either to or <u>by</u> the observed child that are responded to.

21: S to A Initiations Not Responded to: The frequency of initiations made by the observed child to an adult that are not responded to by the adult.

22. S to P Initiations Not Responded to: The frequency of initiations made by the observed child to a peer that are not responded to by the peer.

23. A to S Initiations Not Responded to: The frequency of initiations made by an adult to the observed child that are not responded to by the child.

24. P to S Initiations Not Responded to: The frequency of initiations made by a peer to the observed child that are not responded to by the child.

25. Total Initiations Not Responded to: The frequency of initiations made either to or by the observed child that are not responded to.

26. Total S to A Interactions: The frequency of interactions with the observed child initiating to an adult.

27. Total S to P Interactions: The frequency of interactions with the observed child initiating to a peer.

28. Total A to S Interactions: The frequency of interactions with an adult initiating to the observed child.

29. Total P to S Interactions: The frequency of interactions with a peer initiating to the observed child.

30. Total Interactions S to G: The frequency of interactions of the observed child with a group.

A consultant was obtained to provide the special training to the two members of the research team who were assigned the responsibility for the collection of the data using this instrument. A nursery school on the State College of Arkansas Campus and a kindergarten in the Conway community served as the training ground for the two members.

The data were collected during the normal scheduled activities of the Head Start Child Development Centers using the procedures as set forth by the developers of the instrument. A random sample of children was selected and each child was observed for thirty-six minutes on both the pre-test and post-test dates.

In order to further assess language development, beyond the frequency of verbal interaction recorded by use of the Kansas Social Interaction Observation Procedure, audio tape recordings were made in pre- and post-test situations. The experimenters attempted to standardize the testing procedures with all subjects by controlling the factors of time, and providing a stimulus object which had some openness as one of its characteristics. Each testing situation was for a fifteen minute time period. In regard to the stimulus object a mail-order catalogue with a pictorial section of toys was selected. The subjects were brought into the testing situation in pairs and the experimenter took the catalogue, opened it to the toy section, and asked "What would you like to have?" The question was not directed to either subject, but to both simultaneously. Following the question, the experimenter observed the subjects and gave neither encouragement, nor discouragement, to verbal production. At the end of the fifteen minute period the subjects were told that they could return to the Center activities.

The tapes were analyzed by two research assistants and two professional staff members according to the following schemata:

1. A five minute interval occurred prior to any data being recorded.

2. The number of words in the five minute period used by the subject was determined.

3. The responses were classified according to intent, with regard to questions and/or statements.

4. The responses were further analyzed as to function, that is, if they were ego directed as opposed to being social directed.

5. Responses were categorized into one of the following:
   a. Initiation
   b. Response to others
   c. Self-stimulating response

6. Responses were further classified according to sentence structure, with a range from "garbled, non-intelligible sentence to compound, meaningful sentence."

7. The complete tape segment was then evaluated as to quality of communication. This evaluative aspect was somewhat subjective, in that the evaluators were asked to judge how much of the total communication was understandable, in terms of (1) differential, integrated speech, and (2) voice quality.

While no attempt was made to determine the intercoder reliabilities, it was felt that the protocols possessed enough objectivity that they would have been high.

Design

The experimental design employed in the study was the pre-test, post-test analysis. The pre-test data were collected

between September 1, 1970, and October 15, 1970, and the post-test data were collected between April 1, 1971, and May 15, 1971. A seven-month period lapsed between the pre-testing and the post-testing. The analysis of variance was the statistical tool used in the analysis of the gain scores on all instruments except the Cincinnati Autonomy Test Battery and the Kansas Social Interaction Observation Procedure. Because of the nature of the pre-test data the analysis of covariance was used in the analysis of the data on these two instruments.

Teachers were assigned to the classes using the standard procedures employed by the Head Start Child Development Centers. Where new teachers were employed because of the increase of children necessary for the study, each new teacher was assigned with an experienced teacher. Briefings were given to the directors of the Centers involved in the study, during which time they were told of the research project. In the briefings they were instructed to continue the procedures determined for the year and to follow the instructional guidelines as established by ARVAC. They were exhorted to maintain uniform procedures because the study was not concerned with evaluations or comparisons among and between Centers. Continuous assessments of procedures were undertaken to insure as uniform procedures as possible. There were a minimum of eight teachers involved in each experimental group.

The pre-test data were analyzed primarily to determine whether or not the data met the assumptions of the analysis of variance. The primary concern was associated with the homogeneity of variance assumption. A presentation of the data is given in Chapter III. The analysis and results of the data is discussed in Chapter IV.

CHAPTER III

PRESENTATION OF DATA

Three instruments were used as measures of intelligence and achievement in this study: the Pre-School Inventory, the Peabody Picture Vocabulary Test, and the Test of Basic Experiences, General Concepts. The Cincinnati Autonomy Test Battery was used as a measure of autonomous functioning in problem solving. The Kansas Social Interaction Observation Procedure was used as a measure of social behaviors. Language development was measured through the use of taped recordings of the subjects' conversations with one another.

The plan of this chapter is to present the data obtained from these instruments. The analysis and conclusions drawn from the data constitute Chapter IV.

Pre-School Inventory

Presented in Table V are the results of the data obtained from the Pre-School Inventory. The pre-test means of the three groups were 39.54 for the Experimental I group, 38.39 for the Experimental II group, and 40.98 for the Control group. The standard deviations were 12.58, 12.38, and 13.23 respectively for the Experimental I group, the Experimental II group, and the Control group.

An examination of the post-test results showed that the two experimental groups increased their performance to a

TABLE V

RESULTS OF COMPARISONS BETWEEN EXPERIMENTAL AND CONTROL GROUPS: PRE-SCHOOL INVENTORY

		Exp. I	Exp. II	Control
Pre-Test	$\bar{X}$	39.54	38.39	40.98
	S	12.53	12.38	13.23
Post-Test	$\bar{X}$	48.20	47.96	45.93
	S	10.49	11.81	12.43
Gain Scores	$\bar{X}$	9.04	9.57	4.97
	S	5.66	6.43	5.09
Subjects		50	46	71

TABLE VI

ANALYSIS OF VARIANCE SUMMARY OF THE GAIN SCORES OBTAINED ON PRE-SCHOOL INVENTORY

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Between groups	2	768.246	384.123	
Within groups	164	5,625.168	34.30	11.20*
Total	166	6,393.414		

* Significant beyond the .01 level

greater degree than did the control group, although all three groups showed considerable gain.

The gain scores revealed increases in performance for the two experimental groups of 9.04 and 9.57 respectively for the Experimental I group and the Experimental II group. The Control group showed an increase in gain scores of 4.97.

The analysis of variance summary is presented in Table VI. The obtained F ratio was 11.20, which was significant beyond the .01 level of confidence.

Peabody Picture Vocabulary Test

The data obtained from the Peabody Picture Vocabulary Test are presented in Table VII. The pre-test means for the Experimental I and Experimental II groups were higher than the mean for the Control group; the pre-test means being 87.41, 86.39, and 82.86 respectively for the three groups. A test for the homogeneity of variance showed that the F ratio between the Experimental II group and the Control group was 1.59, narrowly outside the .05 level.

The results of the gain scores showed that both experimental groups increased in performance more so than the control group. The gain score means were 6.54, 8.62, and 3.85 for the Experimental I, Experimental II, and Control groups respectively. The analysis of variance summary for the gain scores on the Peabody Picture Vocabulary Test is presented in Table VIII. The obtained F ratio was 1.18 which was not significant at the .05 level of confidence.

TABLE VII

RESULTS OF COMPARISONS BETWEEN EXPERIMENTAL AND CONTROL GROUPS: PEABODY PICTURE VOCABULARY TEST

		Exp. I	Exp. II	Control
Pre-Test	$\bar{X}$	87.41	86.39	82.86
	S	19.05	17.25	21.78
Post-Test	$\bar{X}$	93.38	95.11	87.11
	S	17.97	13.14	18.59
Gain Scores	$\bar{X}$	6.54	8.62	3.85
	S	15.93	14.71	15.93
Subjects		48	47	71

TABLE VIII

ANALYSIS OF VARIANCE SUMMARY OF THE GAIN SCORES OBTAINED ON THE PEABODY PICTURE VOCABULARY TEST

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Between groups	2	563.818	281.909	
Within groups	163	38,680.910	238.771	1.18
Total	165	39,244.728		

Cincinnati Autonomy Test Battery

Twelve measures of autonomous functioning in problem solving as measured by the Cincinnati Autonomy Test Battery were used as a measure of cognitive development in the study. Identification of the twelve measures, the pre- and post-test means, and standard deviations are shown in Table IX. An examination of the data revealed that the experimental groups showed a greater increase in performance than did the Control group in the areas of innovative behavior, motor impulse control, persistence, resistence to distraction, social competence, and kindergarten prognosis. The Experimental II and Control groups increased in performance in the area of curiosity and task competence moreso than did the Experimental I group. The three groups showed similar increases in the areas of reflectivity, incidental learning, and intentional learning.

The gain score means, standard deviations, and F ratios are presented in Table X. An examination of the gain score means showed that the Experimental I group realized the greatest mean increase in the areas of motor impulse control, reflectivity, incidental learning, and field independence. The Experimental II group showed the greatest mean increase in the areas of curiosity, innovative behavior, intentional learning, persistance, resistance to distraction, task competence, social competence, and kindergarten prognosis. The Control Group did not demonstrate the most gain on any variable.

TABLE IX

RESULTS OF PRE AND POST MEASURES ON THE CINCINNATI AUTONOMY TEST BATTERY

Variable		Exp. I Pre	Exp. I Post	Exp. II Pre	Exp. II Post	Control Pre	Control Post
1. Curiosity	$\bar{X}$	18.14	19.07	18.00	20.58	17.91	20.34
	S	8.13	8.09	5.22	6.19	7.75	5.01
2. Innovative Behavior	$\bar{X}$	5.39	6.68	5.84	7.52	5.97	5.78
	S	3.06	2.39	3.20	3.09	2.54	2.63
3. Motor Impulse Control	$\bar{X}$	19.51	15.87	14.88	14.86	16.49	19.44
	S	13.39	18.96	10.98	10.03	12.86	19.22
4. Reflectivity	$\bar{X}$	5.25	7.18	6.32	7.74	5.41	6.53
	S	2.21	1.79	1.69	1.25	2.16	1.97
5. Incidental Learning	$\bar{X}$	2.71	3.75	3.48	3.64	2.59	3.12
	S	1.44	1.72	1.68	1.96	1.49	1.65
6. Intentional Learning	$\bar{X}$	4.46	5.18	4.23	5.16	4.50	5.03
	S	1.88	2.20	1.49	1.97	1.78	1.76
7. Persistence	$\bar{X}$	21.68	22.43	21.74	22.77	20.84	20.56
	S	3.24	2.73	3.07	2.14	3.64	3.86
8. Resistance to Distraction	$\bar{X}$	11.00	11.78	10.74	12.06	11.16	10.91
	S	4.57	5.08	4.90	5.13	4.46	4.27
9. Field Independence	$\bar{X}$	8.75	10.57	9.64	10.71	8.22	9.94
	S	2.17	1.86	1.98	2.23	2.56	2.55
10. Task Competence	$\bar{X}$	3.59	3.62	3.32	3.84	2.44	3.31
	S	1.17	0.60	0.78	0.51	1.91	0.88
11. Social Competence	$\bar{X}$	3.27	3.52	3.26	3.81	3.28	3.34
	S	1.28	0.61	0.66	0.47	0.33	0.83
12. Kindergarten Prognosis	$\bar{X}$	3.18	3.61	3.48	3.94	3.41	3.48
	S	0.93	0.72	0.75	0.50	0.78	0.61
Subjects		28	28	31	31	32	32

TABLE X

MEANS AND STANDARD DEVIATIONS OF THE GAIN SCORES ON THE CINCINNATI AUTONOMY TEST BATTERY AND THE F RATIOS OBTAINED FROM THE ANALYSIS OF COVARIANCE

Variable		Exp. I	Exp. II	Control	F
1. Curiosity	$\bar{X}$	.928	2.58	2.00	.591
	S	9.51	6.83	7.14	
2. Innovative Behavior	$\bar{X}$	1.43	1.68	- 0.25	2.00
	S	3.69	2.70	2.16	
3. Motor Impulse Control	$\bar{X}$	- 2.30	.11	2.95	.980
	S	14.25	8.76	10.48	
4. Reflectivity	$\bar{X}$	1.93	1.23	.97	1.78
	S	2.01	1.92	2.09	
5. Incidental Learning	$\bar{X}$	1.04	.35	.28	.911
	S	1.67	2.50	2.03	
6. Intentional Learning	$\bar{X}$	.71	.93	.53	.155
	S	2.38	1.99	2.34	
7. Persistance	$\bar{X}$	.18	1.03	- .28	3.21 *
	S	4.49	3.88	4.11	
8. Resistance to Distraction	$\bar{X}$	.71	1.32	- .63	.697
	S	6.36	6.49	5.36	
9. Field Independence	$\bar{X}$	1.82	1.48	1.72	3.22 *
	S	2.30	2.09	1.69	
10. Task Competence	$\bar{X}$	.21	.52	.06	2.08
	S	.82	.75	1.27	
11. Social Competence	$\bar{X}$	.25	.56	.16	2.62
	S	.60	.61	1.01	
12. Kindergartent Prognosis	$\bar{X}$	.29	.45	- .03	4.55 *
	S	.88	.75	1.01	
Subjects		28	31	32	

* Significant beyond .05 level of confidence

Because of the nature of the data, the analysis of covariance was employed in the analysis of the data. The obtained F ratios indicated that three variables, persistence, field independence, and kindergarten prognosis were significant beyond the .05 level of confidence. The variable, social competence, was significant beyond the .10 level of confidence. Of the three variables which produced significant differences, the direction was in favor of the Experimental I group in the area of field independence, while the direction was in favor of the Experimental II group in the areas of persistence and kindergarten prognosis. The direction was in favor of the Experimental II group in the area of social competence.

However, of the ten remaining variables measured by the Cincinnati Autonomy Test Battery, three of the variables were significant beyond the .05 level of confidence. The three variables yielding significant F ratios were persistance, field independence, and kindergarten prognosis. In the areas of persistance and kindergarten prognosis the Experimental II group showed the greatest increase while the Experimental I group showed the greatest increase in field independence. The social competency variable yielded an F ratio beyond the .10 level of confidence and the Experimental II group demonstrated the greatest gain. Even though the remaining variables did not approach significance, on five of the variables the Experimental II group did demonstrate the largest increase.

Test of Basic Experiences

The data obtained from the Test of Basic Experiences, General Concepts are presented in Table XI. The pre-test means were 43.44, 44.09, and 43.56 for the Experimental I, Experimental II, and Control groups, respectively. Although all three groups showed an increase on the post-test means, the Experimental I and Experimental II groups showed larger increases. The analysis of variance summary is presented in Table XII. The obtained F ratio of 1.02 was not significant.

Kansas Social Interaction Observation Procedure

The Kansas Social Interaction Observation Procedure was used as the instrument to measure socialization in the study. Of the 109 variables included in the instrument, thirty were employed for analysis. The means and standard deviations on the pre- and post-measures of the three groups are shown in Table XIII. Because of the nature of the distribution of the data, the analysis of covariance was used as the statistical analysis in the determination of the R ratios. The means, standard deviations of the gain scores, and the F ratios obtained by analysis of covariance procedures are included in Table XIV.

Eight of the thirty variables, one, two, eight, thirteen, eighteen, twenty-four, twenty-eight, and thirty, yielded significant F ratios beyond the .05 level of confidence and

TABLE XI

RESULTS OF COMPARISONS BETWEEN EXPERIMENTAL AND CONTROL GROUPS: TEST OF BASIC EXPERIENCES, GENERAL CONCEPTS

		Exp. I	Exp. II	Control
Pre-Test	$\bar{X}$	43.44	44.09	43.56
	S	5.47	6.49	8.38
Post-Test	$\bar{X}$	48.04	49.69	47.21
	S	6.10	6.67	9.79
Gain Scores	$\bar{X}$	4.59	5.27	3.65
	S	5.66	4.07	4.74
Subjects		27	22	43

TABLE XII

ANALYSIS OF VARIANCE SUMMARY OF THE GAIN SCORES, OBTAINED ON THE TEST OF BASIC EXPERIENCES, GENERAL CONCEPTS

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Between Groups	2	41.210	20.610	
Within Groups	89	1,796.65	20.18	1.02
Total	91	1,837.86		

TABLE XIII

RESULTS OF PRE AND POST MEASURES ON THE KANSAS SOCIAL INTERACTION OBSERVATION PROCEDURE

Variable		Exp. I Pre	Exp. I Post	Exp. II Pre	Exp. II Post	Control Pre	Control Post
1. Σ Verbal Interactions S & A	$\bar{X}$	5.52	7.66	8.87	8.57	8.67	7.63
	S	4.38	6.44	5.79	4.97	5.82	3.66
2. Σ Verbal Interactions S & P	$\bar{X}$	24.48	23.55	24.61	27.43	19.54	24.71
	S	9.40	9.48	8.64	10.66	8.26	10.44
3. Σ Nonverbal Interactions S & A	$\bar{X}$	.93	.76	.61	.39	.83	.75
	S	1.16	1.53	.94	.58	.92	.99
4. Σ Nonverbal Interactions S & P	$\bar{X}$	4.59	4.76	2.87	3.00	5.54	4.75
	S	3.91	3.44	2.14	1.91	3.72	3.50
5. Σ Verbal-Nonverbal Interactions S & A	$\bar{X}$	.83	.72	.74	.78	.92	.79
	S	1.17	1.13	1.25	.95	.93	.83
6. Σ Verbal-Nonverbal Interactions S & P	$\bar{X}$	2.24	2.03	1.57	2.04	2.29	1.79
	S	1.92	1.68	1.97	2.03	1.78	1.61
7. Total Verbal Interactions	$\bar{X}$	31.03	32.00	33.48	36.00	28.21	32.33
	S	10.09	10.74	9.52	10.84	11.38	10.95
8. Total Nonverbal Interactions	$\bar{X}$	5.72	5.97	3.48	3.39	6.38	5.50
	S	3.72	4.48	2.39	2.10	3.73	3.67
9. Total Nonverbal-Verbal Interactions	$\bar{X}$	3.31	3.10	2.30	2.83	3.21	2.58
	S	2.69	2.32	2.49	2.44	2.28	1.84
10. Σ S & A Interactions	$\bar{X}$	8.10	9.41	10.22	9.74	10.42	9.17
	S	7.52	7.78	6.56	5.41	6.43	4.10
11. Σ S & P Interactions	$\bar{X}$	31.62	31.62	29.04	32.48	27.38	31.25
	S	10.50	11.80	9.13	11.54	9.71	10.56
12. Total Verbal Initiations by S	$\bar{X}$	25.59	24.28	27.39	29.91	26.50	25.75
	S	9.96	9.70	7.61	9.39	10.97	25.75
13. Total Nonverbal Initiations by S	$\bar{X}$	4.34	4.38	2.70	2.48	4.96	4.25
	S	3.99	2.88	2.08	2.04	3.69	2.25
14. Total Verbal Responses by S	$\bar{X}$	6.90	7.93	8.96	10.09	5.96	7.75
	S	3.80	3.77	3.83	4.21	3.18	4.83

TABLE XIII, Cont'd.

Variable		Exp. I Pre	Exp. I Post	Exp. II Pre	Exp. II Post	Control Pre	Control Post
15. Total Nonverbal Responses by S	$\bar{X}$	4.03	3.48	3.22	3.30	5.04	4.38
	S	3.30	2.80	2.39	2.53	2.94	2.08
16. S to A Initiations Responded to	$\bar{X}$	3.93	4.34	4.78	5.13	4.08	3.46
	S	3.62	4.06	2.73	3.29	4.08	3.46
17. S to P Initiations Responded to	$\bar{X}$	11.45	11.79	10.35	12.09	10.38	12.17
	S	6.14	5.61	5.13	5.46	5.26	5.51
18. A to S Initiations Responded to	$\bar{X}$	1.59	2.31	2.91	2.26	2.83	2.79
	S	2.11	2.67	2.45	2.07	1.97	2.40
19. P to S Initiations Responded to	$\bar{X}$	9.55	8.86	8.91	10.95	7.38	8.71
	S	4.31	4.54	4.70	4.62	3.61	3.76
20. Total Initiations Responded to	$\bar{X}$	27.03	27.31	26.96	30.43	24.67	27.17
	S	10.98	9.75	8.29	7.81	10.76	7.89
21. S to A Initiations Not Responded to	$\bar{X}$	.83	1.07	1.30	1.26	1.92	1.38
	S	.93	1.46	1.49	1.84	2.62	1.47
22. S to P Initiations Not Responded to	$\bar{X}$	6.34	6.07	6.39	5.39	7.17	6.96
	S	3.75	3.50	2.95	5.40	4.05	6.96
23. A to S Initiations Not Responded to	$\bar{X}$	1.07	1.66	1.43	1.17	1.42	1.58
	S	1.58	1.74	1.73	1.44	1.61	1.35
24. P to S Initiations Not Responded to	$\bar{X}$	3.72	3.62	3.78	4.30	3.92	3.54
	S	2.51	2.83	3.18	2.98	3.05	2.19
25. Total Initiations Not Responded to	$\bar{X}$	11.97	12.41	13.22	12.13	14.38	13.46
	S	5.85	5.65	5.78	5.13	6.60	4.58
26. Total S to A Interactions	$\bar{X}$	4.79	5.41	5.91	6.30	6.04	4.83
	S	4.03	4.75	3.86	4.55	5.05	2.43
27. Total S to P Interactions	$\bar{X}$	17.79	17.66	16.35	17.43	16.50	18.67
	S	7.80	7.13	6.02	9.24	7.06	7.70
28. Total A to S Interactions	$\bar{X}$	2.48	3.93	4.35	3.48	4.33	4.33
	S	2.63	3.63	3.26	2.79	2.44	2.87
29. Total P to S Interactions	$\bar{X}$	13.03	12.38	12.43	15.04	10.00	12.29
	S	4.71	6.80	5.63	6.41	4.75	5.07
30. Total Interaction S & G	$\bar{X}$	12.02	18.94	13.74	10.57	4.13	4.13
	S	6.90	10.17	15.61	14.41	6.10	8.29
Subjects		29	29	23	23	24	24

TABLE XIV

MEANS AND STANDARD DEVIATIONS OF THE GAIN SCORES ON THE KANSAS SOCIAL INTERACTION OBSERVATION PROCEDURE AND THE F RATIOS OBTAINED FROM THE ANALYSIS OF COVARIANCE

Variable		Exp. I	Exp. II	Control	F
1. Σ Verbal Interactions S & A	$\bar{X}$	2.138	- .304	- 1.042	3.38 *
	S	6.55	6.17	5.33	
2. Σ Verbal Interactions S & P	$\bar{X}$	- .0931	2.91	3.88	3.06 *
	S	12.01	8.62	7.30	
3. Σ Nonverbal Interactions S & A	$\bar{X}$	- .172	- .218	- .500	.998
	S	1.39	.72	1.00	
4. Σ Nonverbal Interactions S & P	$\bar{X}$	.170	- .044	- .792	2.22
	S	4.35	2.76	4.65	
5. Σ Verbal-Nonverbal Interactions S & A	$\bar{X}$	- .379	.043	- .458	.568
	S	1.39	1.52	.86	
6. Σ Verbal-Nonverbal Interactions S & P	$\bar{X}$	- .207	.217	- .667	1.22
	S	1.90	2.73	2.49	
7. Total Verbal Interactions	$\bar{X}$	.621	2.521	4.125	1.05
	S	13.12	8.07	8.81	
8. Total Nonverbal Interactions	$\bar{X}$	.241	- .087	- 1.042	3.82 *
	S	5.01	2.93	4.76	
9. Total Nonverbal-Verbal Interactions	$\bar{X}$	- .207	.521	- .625	1.26
	S	2.45	2.75	2.63	
10. Σ S & A Interactions	$\bar{X}$	1.241	- .479	- 1.34	1.05
	S	8.84	6.58	5.73	
11. Σ S & P Interactions	$\bar{X}$	- 2.00	4.043	3.88	1.41
	S	13.76	10.29	10.58	
12. Total Verbal Initiations by S	$\bar{X}$	- 1.379	2.52	- 1.00	.03
	S	12.52	9.90	12.67	
13. Total Nonverbal Initiations by S	$\bar{X}$	.034	- .217	- .075	3.58 *
	S	4.74	2.55	4.15	
14. Total Verbal Responses by S	$\bar{X}$	1.034	1.130	1.790	2.83
	S	4.91	4.45	4.94	

TABLE XIV, Cont'd.

Variables			Exp. I	Exp. II	Control	F
15.	Total Nonverbal Responses by S	$\bar{X}$	- .552	.080	- .775	1.63
		S	3.93	3.22	2.39	
16.	S to A Initiations Responded to	$\bar{X}$	.410	.340	- .625	.290
		S	3.45	3.20	3.33	
17.	S to P Initiations Responded to	$\bar{X}$	.340	1.652	1.790	.450
		S	6.75	6.13	5.90	
18.	A to S Initiations Responded to	$\bar{X}$	.724	- .652	- .050	3.08*
		S	2.91	3.06	2.87	
19.	P to S Initiations Responded to	$\bar{X}$	- .759	1.780	1.333	1.74
		S	5.69	5.40	4.72	
20.	Total Initiations Responded to	$\bar{X}$	.276	3.480	2.50	.498
		S	12.04	6.24	8.26	
21.	S to A Initiations Not Responded to	$\bar{X}$	.241	- .042	- .542	1.99
		S	1.85	1.60	2.29	
22.	S to P Initiations Not Responded to	$\bar{X}$	- .276	- 1.087	- .209	.258
		S	4.83	5.04	5.42	
23.	A to S Initiations Not Responded to	$\bar{X}$	.586	- .260	.166	.166
		S	2.43	2.21	1.36	
24.	P to S Initiations Not responded to	$\bar{X}$	- .104	.521	- .375	4.02*
		S	3.48	3.91	2.48	
25.	Total Initiations Not Responded to	$\bar{X}$	.490	- 1.087	- .500	.927
		S				
26.	Total S to A Interactions	$\bar{X}$	.620	.390	- 1.208	.997
		S	4.31	4.23	4.37	
27.	Total S to P Interactions	$\bar{X}$	- .414	1.09	1.96	.493
		S	8.03	8.32	7.63	
28.	Total A to S Interactions	$\bar{X}$	1.44	- .870	0.00	4.61*
		S	4.26	4.13	3.16	
29.	Total P to S Interactions	$\bar{X}$	- .655	2.610	2.29	2.58
		S	7.47	5.93	5.86	
30.	Total Interactions S & G	$\bar{X}$	3.28	- 3.174	0.00	7.79*
		S	20.27	18.51	10.03	

* Significant beyond the .05 level of confidence

one variable (thirty) was significant beyond the .01 level of confidence. Two variables, fourteen and twenty-nine were approaching the .05 level of confidence, and were beyond the .10 level of confidence.

Three of the variables which measured the frequency and nature of interaction between subject and adult were significant and in each case the direction was in favor of the Experimental I group. These variables were Verbal Interactions Subject and Adult (variable one), Adult to Subject Initiations Responded to (variable eighteen, and Total Adult to Subject Interactions (variable twenty-eight).

One of the variables (two) which measured the frequency and nature of interactions between peer and subject was significant and the direction was in favor of the Control group, although the Experimental II group fared almost equally as well. Variable twenty-nine which measured total peer to subject interaction yielded a F ratio beyond the .10 level of confidence and the direction was in favor of the Experimental II group with the Control group fairing almost equally as well. Variable twenty-four which measured peer to subject not responded to yielded a significant F ratio beyond the .05 level of confidence and the direction was in favor of the Experimental II group.

Language Development Assessment

The data relative to language development assessment are

presented in Tables XV - XXII. Data were distributed among four major divisions. They were: number of words used in a five minute sequel; function of language within the five minute span; structure and complexity of sentences used during the period of time; and quality of voice as related to how much of the communication was understandable.

Means and standard deviations are presented for pre- and post-test measures on twenty-five subjects in each group. One hundred fifty pairs of language tapes were analyzed. The means, standard deviations and F ratios on the gain scores are contained in Tables XVI, XVII, XX and XXII.

Verbal facility, as measured by the mean number of words used in the five minute sequel, increased for all three groups. Gains were more pronounced for the two experimental groups; however, F ratios were not significant for the gain scores.

Data relative to speech functions are analyzed in Tables XVII and XVIII. There were seven variables assessed on speech functions. Mean scores for statements (verbal facility) increased for each group; the number of questions asked by both experimental groups increased; however, the mean number of questions asked decreased for the Control group; mean number of statements of an egocentric nature decreased for both experimental groups, but increased for the control group, and conversely statements which were socio-directed increased for the experimental groups and decreased for the control group; subjects increased in initiating communication as indicated

TABLE XV

LANGUAGE DEVELOPMENT: PRE AND POST MEASURES OF MEANS AND STANDARD DEVIATIONS OF NUMBER OF WORDS USED IN A FIVE MINUTE SEQUEL

		Exp. I	Exp. II	Control
Pre-Test	$\bar{X}$	73.39	73.05	90.70
	S	38.83	35.21	41.56
Post-Test	$\bar{X}$	94.50	93.36	104.80
	S	35.21	41.57	48.00
Subjects		25	25	25

TABLE XVI

LANGUAGE DEVELOPMENT: MEANS, STANDARD DEVIATIONS AND F RATIOS OF GAIN SCORES ON WORDS USED IN FIVE MINUTE SEQUEL

		Exp. I	Exp. II	Control	F
Gain Scores	$\bar{X}$	21.11	20.32	14.10	.20
	S	37.02	33.83	66.00	

TABLE XVII

LANGUAGE DEVELOPMENT: PRE- AND POST-TEST MEANS AND STANDARD DEVIATIONS OF SPEECH FUNCTIONS IN FIVE MINUTE SEQUEL

Variable		Exp. I		Exp. II		Control	
		Pre	Post	Pre	Post	Pre	Post
1. Statement	$\bar{X}$	10.44	12.40	12.64	13.82	12.75	15.30
	S	5.11	4.33	5.51	6.33	6.30	5.71
2. Question	$\bar{X}$	1.28	2.17	1.91	2.18	2.10	1.55
	S	2.20	3.58	2.27	2.52	1.20	1.40
3. Egocentric	$\bar{X}$	6.17	6.06	8.73	7.14	8.25	9.15
	S	4.72	3.70	4.86	3.06	4.10	3.93
4. Socio-directed	$\bar{X}$	5.78	9.56	5.45	7.90	7.20	7.20
	S	4.34	7.08	4.95	6.75	5.91	6.22
5. Initiation	$\bar{X}$	6.16	8.44	8.42	9.68	8.20	8.75
	S	3.18	4.31	3.27	4.52	2.54	4.25
6. Response to Others	$\bar{X}$	3.61	4.67	3.36	4.32	3.50	4.60
	S	3.47	3.23	2.80	2.40	2.48	2.78
7. Response to Self	$\bar{X}$	2.22	2.50	2.04	1.77	3.95	3.15
	S	2.39	3.85	3.14	2.86	5.18	4.53
Subjects		25	25	25	25	25	25

TABLE XVIII

LANGUAGE DEVELOPMENT: MEANS, STANDARD DEVIATIONS AND F RATIOS OF GAIN SCORES OF SPEECH FUNCTIONS IN A FIVE MINUTE SEQUEL

Variable		Exp. I	Exp. II	Control	F
1. Statement	$\bar{X}$	3.50	1.18	2.25	.664
	S	5.82	6.25	6.60	
2. Question	$\bar{X}$	.89	.27	- .55	1.50
	S	2.46	2.83	2.13	
3. Egocentric	$\bar{X}$	- .11	-1.49	.95	1.80
	S	2.10	5.19	4.53	
4. Sociodirected	$\bar{X}$	3.78	2.45	.00	2.04
	S	6.88	5.77	4.42	
5. Initiation	$\bar{X}$	2.28	1.22	.55	.612
	S	5.58	4.43	4.11	
6. Response to Others	$\bar{X}$	1.06	.95	1.10	.010
	S	3.24	3.28	3.46	
7. Response to Self	$\bar{X}$	.28	- .32	- .80	.310
	S	2.86	3.78	5.24	

TABLE XIX

LANGUAGE DEVELOPMENT: PRE- AND POST-TEST MEASURES OF MEANS AND STANDARD DEVIATIONS OF SENTENCE STRUCTURES IN A FIVE MINUTE SEQUEL

Variable		Exp. I		Exp. II		Control	
		Pre	Post	Pre	Post	Pre	Post
1. Nonsense	$\bar{X}$	.39	.11	.136	.409	.15	.35
	S	.68	.32	.62	1.07	.478	.729
2. Sub.-Verb	$\bar{X}$	1.11	1.56	.818	.864	.70	.95
	S	1.20	2.56	1.53	1.29	.843	.92
3. Sub.-Verb-Object	$\bar{X}$	6.67	9.55	9.81	9.63	11.30	9.65
	S	4.12	4.39	4.48	3.52	4.78	3.92
4. Sub.-Verb-Obj.-Phrase	$\bar{X}$	2.11	3.22	2.41	2.54	2.15	3.15
	S	2.60	4.30	3.94	3.35	3.32	3.74
5. Compound	$\bar{X}$	1.72	1.61	1.32	1.54	1.20	2.75
	S	2.15	1.38	1.36	1.99	1.12	2.53
Subjects		25	25	25	25	25	25

TABLE XX

LANGUAGE DEVELOPMENT: MEANS, STANDARD DEVIATIONS AND F RATIOS OF GAIN SCORES OF SENTENCE STRUCTURES IN A FIVE MINUTE SEQUEL

Structure		Exp. I	Exp. II	Control	F
1. Nonsense	$\bar{X}$	- .28	.27	.20	3.54 *
	S	.80	.53	.71	
2. Sub.-Verb	$\bar{X}$	.44	.04	.25	.194
	S	3.02	1.33	1.20	
3. Sub.-Verb-Ojbject	$\bar{X}$	2.89	- .18	-1.65	2.74
	S	6.23	6.27	5.15	
4. Sub.-Verb-Obj.-Phrase	$\bar{X}$	1.11	.14	1.00	.499
	S	4.28	2.17	3.46	
5. Compound	$\bar{X}$	- .11	1.23	1.55	3.14
	S	2.05	2.06	2.17	

*Significant beyond .05 level of confidnece

TABLE XXI

LANGUAGE DEVELOPMENT: PRE- AND POST-TEST MEASURES OF MEANS AND STANDARD DEVIATIONS OF QUALITY OF SPOKEN LANGUAGE

		Exp. I	Exp. II	Control
Pre-Test	$\bar{X}$	3.72	3.36	3.85
	S	.803	1.19	.656
Post-Test	$\bar{X}$	3.89	3.40	3.85
	S	.66	1.33	1.01
Subjects		25	25	25

TABLE XXII

LANGUAGE DEVELOPMENT: MEANS, STANDARD DEVIATIONS AND F RATIOS OF GAIN SCORES OF QUALITY OF SPOKEN LANGUAGE

		Exp. I	Exp. II	Control	F
Gain Scores	$\bar{X}$	.17	.04	.25	.594
	S	.68	.63	.43	

by increases in means for all groups; likewise increases in means were noted for all groups on the speech function of response to others; and auto-stimulated responses increased for the Experimental I group and decreased for Experimental Group II and the Control Group.

Analysis of gain scores on speech functions did not reveal any F ratios significant at the .01 or .05 level. An F ratio of 2.04, which was the largest determined for this area was found on the variable of socio-directed speech, with the experimental groups showing the greater gains. Egocentric speech analysis revealed an F ratio of 1.80, second highest in this set. Both experimental groups reduced in statements of an egocentric nature, while the Control group increased.

Sentence structures for the three groups were analyzed by use of the five minute time segment. Results are reported in Tables XIX and XX. Sentences were classified ranging from nonsense (lacking subject and/or verb, and representing a clustering of words) to compound. Few nonsense statements were used by the groups; however, the Experimental Group II and the Control Group showed increases from those recorded at the pre-test level.

Complexity was revealed by the use of subject-verb, object, phrase and compound sentences. The data indicated that there were increases on most variables for each group.

Table XX presents data relative to analysis of the gain scores of sentence structure. The data indicate that a significant ratio was determined for the nonsense category. The use of nonsense sentence structure was reduced in Experimental Group I; however, it was increased in both Experimental Group II and Control Group. The use of compound sentences decreased with Experimental Group I, however, increases were noted for Experimental II and Control Group. With the latter category, use of compound sentences, an F ratio of 3.14 was yielded.

Tables XXI and XXII contain data yielded from audio ratings of quality of spoken language. Experimental Groups I and II showed some increases with post-testing as opposed to pre-testing. The Control Group was rated the same on both occasions. The F ratio of gain scores did not approach significance.

CHAPTER IV

ANALYSIS AND CONCLUSIONS

Introduction

The three major hypotheses under consideration in this study were related to the degree of improvement in the cognitive, social, and language areas of disadvantaged children under two experimental conditions. The hypotheses under consideration were:

1. There will be no significant differences between the increment in cognitive development of the disadvantaged children in the experimental and control groups.

2. There will be no significant difference between the increment in social development of the disadvantaged children in the experimental and control groups.

3. There will be no significant difference between the increment of language development of disadvantaged children in the experimental and control groups.

The purpose of this chapter is to analyze and draw conclusions from the data presented in Chapter III. The structure of this chapter, therefore, will follow the same outline as Chapter III.

Cognitive Development

Four instruments were employed in the collection of data related to the cognitive area of development: the Pre-School

Inventory, the Peabody Picture Vocabulary Test, the Test of Basic Experiences, General Concepts, and the Cincinnati Autonomy Test Battery. The F ratios obtained on the data from the Pre-School Inventory, the Peabody Picture Vocabulary Test and the Test of Basic Experiences, General Concepts showed a significant difference between the experimental groups and the control group only on the Pre-School Inventory. While the F ratios were not significantly different on the Peabody Picture Vocabulary Test and the Test of Basic Experiences, General Concepts, the trends were in favor of the experimental groups.

The results obtained from the data on the Peabody Picture Vocabulary Test and the Test of Basic Experiences, General Concepts were remarkably similar. The results are not surprising when an analysis of the contents of the two instruments were undertaken. An examination of the technical data presented in the manual for the Peabody Picture Vocabulary Test reveals that it is essentially a measure of verbal intelligence with emphasis upon receptive language rather than expressive language. The author of the manual states that "in light of the growing body of literature on the many facets of intellect, one must concede that the Peabody Picture Vocabulary Test is not providing a comprehensive measure of intellectual functioning. Instead, by means of a short, restricted sample of behavior, it attempts to provide a useful prediction of school success, especially in the areas which

call more heavily on verbal intelligence." Although no data are available at this time to support such an hypothesis, it is likely that a rather high positive correlation would be found between the two instruments in the measurement of verbal intelligence.

Two of the twelve variables measured by the Cincinnati Autonomy Test Battery, curiosity and incidental learning, rely more heavily on verbal functioning than do the other variables. An examination of the results obtained show that only on the curiosity variable did the Control Group show a greater increase than either of the experimental groups. Although the Control Group did not show as great an increase as the Experimental II Group, it did show a slightly greater increase than the Experimental I Group. The two experimental groups did show slightly greater gains than the Control Group on the incidental learning variable, although the differences in increase were less than for the other variables measured by the instrument.

Of the remaining ten variables measured by The Cincinnati Autonomy Test Battery, three variables, Persistence, Field Independence, and Kindergarten Prognosis were statistically significantly different and in each case the direction was in favor of the experimental groups. The social competence variable was approaching significance ($F = 2.62$) and again the direction was in favor of the experimental groups. Although there were greater mean differences in favor of the

experimental groups on the remaining six variables, none were approaching significance.

Based on the data obtained from the instruments designed to measure cognitive behaviors, there appears to be a rather strong degree of consistency in the findings. The experimental groups showed superior gains in the areas of concept formations and development, and in skill performance, while there were only negligible differences in the increases in verbal skills. The statistically significant difference in favor of the experimental groups on the Pre-School Inventory and the trends in favor of the experimental groups on the variables of the Cincinnati Autonomy Test Battery give support to the first conclusion, while the finding of no significant differences between the experimental and control groups on the Peabody Picture Vocabulary Test and the Test of Basic Experiences, General Concepts give support to the second conclusion.

There are two possible reasons advanced as to why the experimental groups did not demonstrate superior performance in verbal skills. According to some theories of child development, particularly Piaget's, the verbal skills are not adequately developed at a preschool age. Although there are indications that specific intervention programs make a difference, advantaged children who have not experienced formalized intervention programs are not likely to possess the

degree of verbal skills necessary to influence their disadvantaged peers.

It is also likely that verbal skills are more a product of formal school experiences than are other areas of cognitive functioning. An evaluation of the body of literature which is related to the intellectual functioning of the general population of the State of Arkansas indicate greater deficits in verbal skills than other intellectual skills. For example, data obtained over a ten-year period on incoming freshmen at State College of Arkansas, of which over eighty per cent are native Arkansans, on college entrance examinations show that they are below the national average in cognitive functioning, and the most severe deficits are in the area of verbal intelligence. Inasmuch as there are over 270,000 adults, eighteen years of age and older, residing in the State with less than an eighth grade education means that a major source of verbal skill development was not available to approximately thirty-five per cent the parents. Furthermore, it is in the rural counties where the majority of this population resides in relation to the total population, and it is in rural counties where the ARVAC Head Start Child Development Centers are located. Consequently, it is likely that the advantaged children did not possess the verbal skills to such a degree that the disadvantaged children could profit from such experiences.

Social Development

The Kansas Social Interaction Observation Procedure is designed to measure the nature and frequency of interactions among and between subjects and with any other people who may be present during the testing periods. The major variables are associated with measuring the frequency of interaction between subjects and peers and subjects and adults. More specifically the instrument measures initiations, responses to initiations, lack of responses to initiations, verbal and non-verbal initiations and responses for a subject over a thirty-six minute period measured in segments of twelve minutes each.

Two of the variables which measured the nature and frequency of interaction between adults and subjects (variables one and twenty-eight) gave support to the Experimental I Group. Although they were not significant, other variables which measured the nature and frequency of interactions between adult and subjects (variables ten, sixteen, and twenty-six) the larger increases were in favor of the Experimental I Group.

Of the variables which measured the nature and frequency of interactions between subjects and peers, only variable two was significant beyond the .05 level of confidence. The Control Group demonstrated the largest increase, although the Experimental II Group fared almost equally as well. The significant difference was between the Experimental II Group and

and Control Group and the Experimental I Group. In fact, the Experimental I Group showed a net decrease on the mean gain scores of nearly one point while the Experimental II and Control Groups showed increases of 2.91 and 3.88, respectively. Other variables which measured the nature and frequency of interactions between subjects and peers (variables eleven, seventeen, nineteen, twenty-seven, and twenty-nine), although not significant, showed the same pattern, i.e., the Experimental II and Control Groups realizing larger increases than the Experimental I Group. Variable twenty-nine which measured the total peer to subject interaction was significant beyond the .10 level of confidence.

The data tends to support the conclusion that as the socioeconomic mix of a group increases there is a tendency for the subjects to interact more with the adult (teacher) and when the socioeconomic mix reaches a 50-50 ratio there is a decrease in subject and peer interactions. However, there appears to be as strong a subject and peer interaction when the socioeconomic mix is a 75-25 disadvantaged-advantaged ratio as when all of the group are disadvantaged. Furthermore, the 75-25 ratio does not show the lack of subject and adult interaction as does a group in which all are disadvantaged. The conclusions drawn here are supported, also in a study done by Feitelson. The major purpose of this study was to analyze how heterogeneous grouping influences social interaction. Two groups were employed, one in which all members were disadvantaged

and one in which there was a 2:1 ratio of advantaged-disadvantaged members. Seven measures of social interaction were used and the data were collected over a two-year period. One of the major findings of her study was that at the end of the two-year period the disadvantaged children in the heterogeneous groups cooperated significantly more with adult than with peers. On the other hand, the disadvantaged children showed increases in their cooperation with peers, and became less dependent with adults.

However, it must be recognized that there are at least three alternatives that could cause such trends other than the socioeconomic mix variable. The influence of the teacher personality on the interactions of the group is always a significant variable. However, attempts were made to minimize the variable by the assignments of the teachers to the classrooms. Also, there was a minimum of eight teachers working with each of the three groups which further helped to reduce the influence of the teacher variable. Secondly, the philosophy of the Head Start Child Development Center is influencing such trends is possible. If such was the case, however, the fact that three of the four Experimental I and Control Groups were located in the same communities and under the same leadership at the director level should have caused greater similarities between the Experimental I and Control Groups and not between the Experimental II and Control Groups. Thirdly, the variation in living patterns and interactions between communities is a possible

cause for such trends, although it would appear to be minimized for the same reasons identified in the statement concerning the location and leadership of the Head Start Child Development Centers.

Another trend identified in the analysis of the data was the increase in verbal interactions in all three groups (variable seven) and a corresponding decrease in non-verbal interactions, except for the Experimental I Group which showed a slight increase in non-verbal interactions as well (variable eight).

The basic purpose of the Kansas Social Interaction Observation Procedure was designed to measure the frequency of interactions between the subject and the people within his immediate environment during a normal free-play period. One of the twelve variables (number eleven) measured by the Cincinnati Autonomy Test Battery attempts to measure the social behavior of a subject in a problem-solving setting. On this variable, social competence, the obtained F ratio was 2.62, which was significant beyond the .10 level of confidence in favor of the experimental groups.

Language Development

Language development was assessed by means of audio recordings gathered in both pre- and post-test settings. Five minute segments of the tapes were evaluated, with the data being recorded under the following major categories: verbal

facility, speech functions, speech structure, and voice quality.

All groups gave evidence of increased verbal facility from pre-testing to post-testing with mean increases of more than twenty words occurring with each of the experimental groups, and fourteen words with the Control Group. With this dimension there was no attempt to assess any factor beyond that of a word count. It has been demonstrated that lower socioeconomic youngsters, and lower socioeconomic people in general, have a differential verbal style from middle-class youngsters. Part of this verbal style is marked by reticence in social relationships. While the data gave no evidence of a paucity of words, it does indicate that verbal facility gains occurred to a lesser extent with the lower socioeconomic control group than with the socioeconomic mixed experimental groups. Williams and Mattson reported in their study with subjects who were three and one-half years old, that the average child of this age in the presence of another child and the experimenter generated 127 words in a ten minute period. The subjects in the current study were somewhat older and generated words at a greater per minute flow than the subjects in the study cited.

Speech functions include the many facets of communicating verbally with self and others. The taped segments were evaluated according to the functions of the verbal responses.

An analysis of the data revealed no F ratios significant

at the .01 or .05 level of confidence. There were several trends which were evident. First, the experimental groups utilized more socio-directed statements in the post-testing than did the Control Group, and secondly, made fewer egocentric statements. Thirdly, while both experimental groups made some gains in verbal behaviors of a questioning nature, the analysis of the post-test tapes of the subjects in the Control Group revealed fewer questions than with the pre-test tapes.

In summary, data relative to speech functions indicated that the Control Group tended to engage in fewer verbal communications that were socio-directed and questioning, and more verbal behaviors that were egocentric.

Data relative to skills in communicating verbally were analyzed according to complexity of sentences used. The range of structure was from a cluster of words, lacking a verb and/or object (nonsense) to compound sentences. An F ratio at a level of significance was reported for the use of nonsense groupings of words. Analysis of tapes of Experimental Group I indicated fewer statements of this nature on the post-test than on the pre-test; however, results of Experimental Group II, and the Control Group showed increases. Complexity of sentence structure as evidenced by use of verbs, objects, and phrases, tended to increase with all groups except, Experimental Group II, and the Control Group used

fewer sentences involving subject, verb and object; and Experimental Group I used fewer compound sentences than the other two groups in the post-test setting.

In summary, the data on the sentence structure indicated that Experimental Group I made more consistent pronounced gains than did either of the other two groups. However, small consistent gains were made by both the Experimental II and Control Groups with the exceptions noted above.

Subjects' tapes were judged by the quality of spoken language. A five point rating scale was used, ranging from "1" with less than twenty per cent of the communication understandable to "5" with at least eighty per cent understandable. The three groups were not significantly different from each other in this dimension of language development with an F ratio of .594 being determined.

Verbal development of the three groups, as revealed by analysis of audio tapes, led to the following conclusions:

1. On eleven of the fifteen measured variables of language development Experimental Group I had larger gains than did the Control Group or Experimental II Group.

2. The Control Group had larger gains than either of the experimental groups on three measured variables. The three also included one gain in a negative direction, egocentric speech.

3. The basic structure used by older children and adults in sentence development is found in the grammar of these

subjects.

4. Sentence length and complexity increases with age, as revealed by data classified under verbal facility and sentence structure.

5. Socialized speech in the two experimental groups increased during the experimental period, while such speech declined for the Control Group.

6. Egocentric speech decreased with advancement in age with the two experimental groups, but increased with the Control Group.

7. Gains in complete sentences generated increased most for those subjects in Experimental Group I (a mean gain of 4.3 sentences from pre- to post-testing); next for Experimental Group II (1.3 mean gain); and least for the Control Group (1.1 mean gain).

Variations in Socioeconomic Mix

One of the major goals of the study was to determine the effects of varying socioeconomic mix on the cognitive, social and language development of disadvantaged children. Of the three groups employed in the study, the Experimental I Group was a 50-50 ratio of disadvantaged-advantaged children, the Experimental II Group was a 75-25 ratio of disadvantaged children, and the Control Group consisted of 100 per cent disadvantaged children.

An evaluation of the data designed to measure intellectual

functioning indicated rather strong trends, and in several cases statistically significant trends in favor of the experimental groups in comparison to the Control Group. Scores obtained on the Peabody Picture Vocabulary Test, Pre-School Inventory, The Test of Basic Experiences, General Concepts, and the twelve variables included in the Cincinnati Autonomy Test Battery yield greater mean increases on essentially all variables, and there was a statistically significant difference between the experimental groups and the Control Group on the Pre-School Inventory and three of the twelve variables on the Cincinnati Autonomy Test Battery.

Further examination of the data revealed that the Experimental II Group realized consistently greater mean increases over the Experimental I Group, although none of the A Priori analyses yielded any significant differences. However, it should be noted that when the Experimental II Group was compared to the Control Group on the Peabody Picture Vocabulary Test the difference was approaching significance ($F = 2.75$).

An evaluation of the social interaction patterns obtained from the Kansas Social Interaction Observation Procedure strongly suggested the following interpretation. In the Experimental I Group the patterns of interaction indicated decreases in interactions between subject and peers and an increased interaction between subject and adult. The converse was true for the Control Group, e.g., the frequency of interactions

between subject and peer increased and the frequency of interactions between subject and adult decreased. The Experimental II Group maintained larger frequencies of interaction with peers than the Experimental I Group and larger frequencies of interaction with adults than the Control Group. The data suggest that a 75-25 ratio is the most desirable ratio of disadvantaged-advantaged children, if the major concern is maintaining a pattern of interactions between the subjects and both peers and adults.

Essentially the same findings were reported by Feitelson in her study of social interaction patterns of heterogeneous pre-schools in Israel. In this study two groups were employed for analysis, one of which was comprised of twenty-four disadvantaged children and the second group was composed of twenty-four disadvantaged children and forty-eight advantaged children. The author of this study discovered that in the homogeneous group the pattern of interactions increased greatly with peers and decreased with adults, while the opposite was true for the heterogeneous group. These findings give support to the conclusions drawn in this study regarding the patterns of social interaction.

Analysis of the language development data resulted in three factors in speech functions which approached significance, interrogative responses, in favor of the experimental groups; egocentric, with increases favoring the Control Group; and sociodirected, with both experimental groups having more responses of this nature. On sentence structure, three factors approached or reached a

significant level. Experimental Group I differed from the Control Group in terms of using fewer responses lacking subject and/or verb. Experimental Group I also differed from the Control Group in use of sentences having subject, verb and object, with the experimental group using more complex sentences. The Experimental I Group and the Control Group differed in use of compound sentences with the Control Group using more compound than the Experimental I Group.

Recommendations

If future studies are likely to yield the most profitable results, it would appear that the research must center around studying and identifying those conditions under which socioeconomic mix is optimized. Some of the variables to which socioeconomic mix should be related are rural-urban disadvantaged children, teacher behaviors, teaching strategies, etc. Although this study indicated that socioeconomic mix is a major and significant variable in its effects on disadvantaged children, other studies such as the one by DeLorenzo (1969) concluded that socioeconomic mix in and of itself is not an effective treatment for remedying the educational deficits of the disadvantaged. It is likely that apparent conflicting results will continue unless socioeconomic mix is analyzed in relation to other variables as has been identified above. Because of the consistency of the findings in this study in favor of the 75025 ratio of disadvantaged-advantaged children, it is recommended that future studies strongly consider this ratio in the study design.

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APPENDIX

Cincinnati Autonomy Test Battery (CATB)

Kansas Social Interaction Observation Procedure

Analysis of Verbal Responses

Modified CAIB Sept. '68
Proto. 4

Record Booklet

Child's Name _____ Tester _____

School _____ Experimental Control (circle one)

Address _____ Phone _____ Sex _____ Race _____

	yr.	mo.	day
Date of Test	_____	_____	_____
Child's Birthdate	_____	_____	_____
Age	_____	_____	_____ (add 1 mo: if 15 days or more)

Age in months _____

Child's Name _____ Proto. # _____

Task Initiation: (circle proper rating)

1. No initiation. Child sat with hands in lap and watched E. Child sat and looked about the room.

2. Minimal contact: No real involvement is shown - child touched figures but withdrew. Child knocked figure down and immediately withdrew.

3. Initiation but minimal involvement. Child moves figures about randomly but no organization. Child lays all figures down - no systematic play.

4. Initiation - high degree of involvement - organized activity. Child pairs all animals or stands them side by side. Child groups figures and puts them inside barricade. Child puts figures on top of one another.

Curiosity Box

Activity

Verbalization

Time	Manip. Explo.	Tact. Explor.	Visual Explor.	Other	Move.- Subject	Move.- Box	Time	Box Related: Quest. &/or Comment	Box Related: Fantasy	Other: Quest. &/or Comment	Other: Fantasy
.30	me	te	ve	other	m-s	m-b	.50	q &/or c	fan	c &/or c	fan
1.00	me	te	ve	other	m-s	m-b	1.00	q &or c	fan	q &/or c	fan
1.50	me	te	ve	other	m-s	m-b	1.50	q &/or c	fan	q &/or c	fan
2.00 Prompt	me	te	ve	other	m-s	m-b	2.00 Prompt	q &/or c	fan	c &/or c	fan
2.50	me	te	ve	other	m-s	m-b	2.50	q &/or c	fan	q &/or c	fan
3.00 Term	me	te	ve	other	m-s	m-b	3.00 Term	c &/or c	fan	q &/or c	fan
3.50	me	te	ve	other	m-s	m-b	3.50	q &/or c	fan	c &/or c	fan
4.00	me	te	ve	other	m-s	m-b	4.00	c &/or c	fan	q &/or c	fan
4.50	me	te	ve	other	m-s	m-b	4.50	q &/or c	fan	c &/or c	fan
5.00	me	te	ve	other	m-s	m-b	5.00	q &/or c	fan	q &/or c	fan

Child's Name: _____ Sept. '36

Impulse Control:

Fast line (training)

Total length _____

Total time

Aver. In./.01 min. _____

Slow line # 1

Time:_____

Length:_____

In./.01 min._____

Slow Line # 2

Time:_____

Length:_____

In./.01 min._____

Slow Line # 3

Time: _____

Length: _____

In./.01 min. _____

Child's Name _____ September 19o6

Incidental Learning

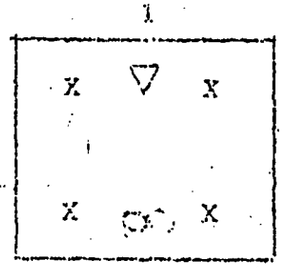
Incidental Recall	Labeling	Post-Familarization Recall
	T1. Table	
	T2. House	
	T3. Apple	
	1. Dog	
	2. Girl	
	3. Wagon	
	4. Airplane	
	5. Telephone	
	6. Bed	
	7. Shoe	
	8. Car	
	9. Hat	
	10. Boat	
Total		Total

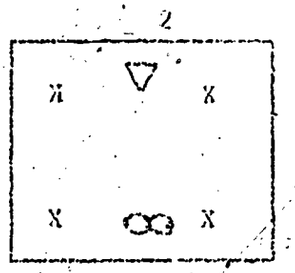
Irrelevant Responses:

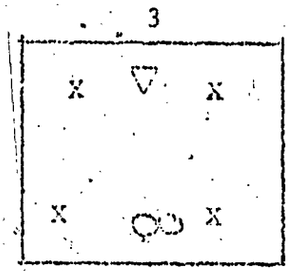
Irrelevant Responses:

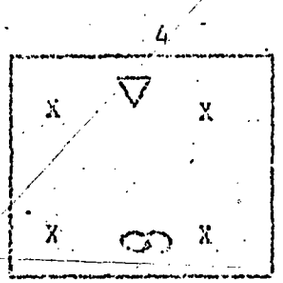
Child's Name _____ September 1966

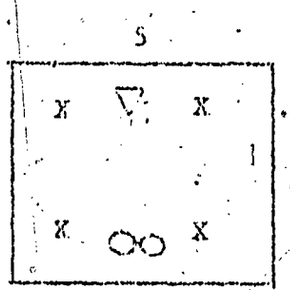
Response Variability Score (number of different ways) _____

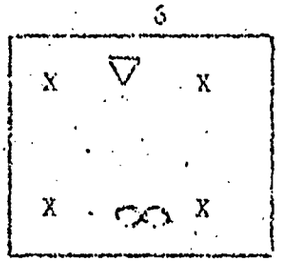


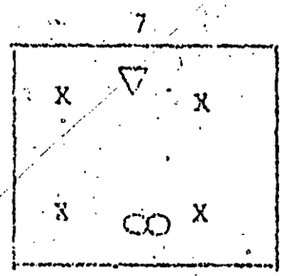


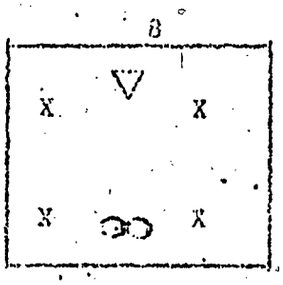


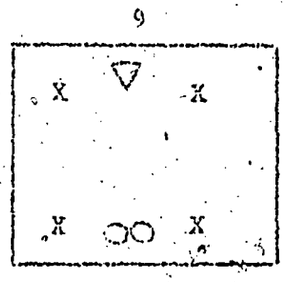


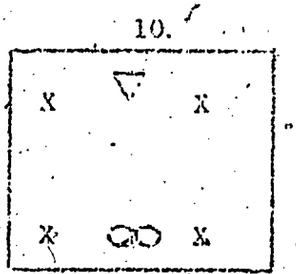










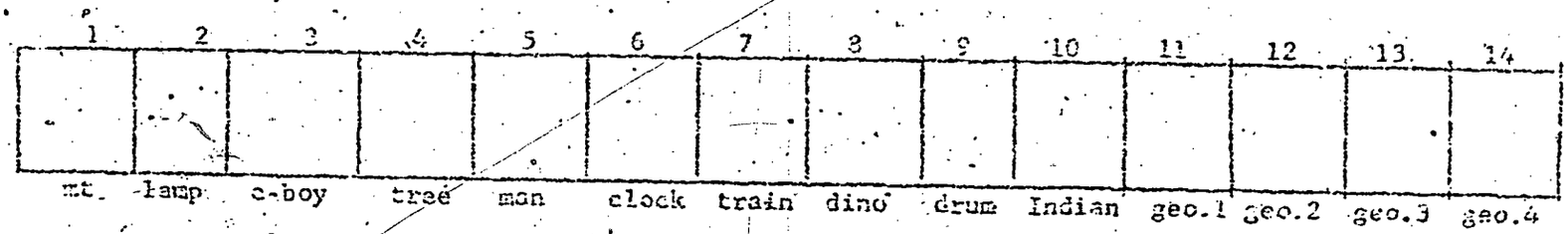


Child's Name_____ November, 1966

EC ÷ EFT

Early Childhood - Embedded Figures Test

Cone



Cone Score:_____

Puzzle Board: #2 manipulation board

Activity

Verbalization

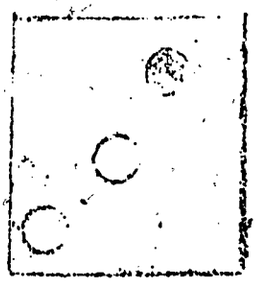
Board Related

Other

Time	Manip. -Explor.	Other	Move.- Subject	Move.- Boards	Time	Quest. &/or Comment	Fantasy	Quest. &/or Comment	Fantasy
.50	me	other	m-s	m-b	.50	q &/or c	fan	q &/or c	fan
1.00	me	other	m-s	m-b	1.00	c &/or c	fan	q &/or	fan
1.50	me	other	m-s	m-b	1.50	q &/or c	fan	q &/or	fan
2.00 Prompt	me	other	m-s	m-b	2.00 Prompt	q &/or	fan	q &/or c	fan
2.50	me	other	m-s	m-b	2.50	q &/or	fan	q &/or	fan
3.00 Term	me	other	m-s	m-b	3.00 Term	q &/or c	fan	q &/or c	fan
3.50	me	other	m-s	m-b	3.50	q &/or	fan	q &/or	fan
4.00	me	other	m-s	m-b	4.00	c &/or	fan	q &/or c	fan
4.50	me	other	m-s	m-b	4.50	q &/or	fan	q &/or	fan
5.00	me	other	m-s	m-b	5.00	q &/or	fan	q &/or c	fan

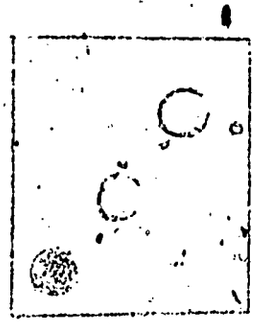
Early Childhood -- Matching Familiar Figures Revised -- Summer '67

#1 Circle



#2 Girl

#3 Cat

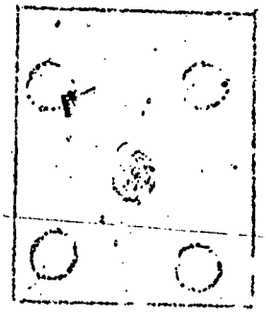


#4 Boy

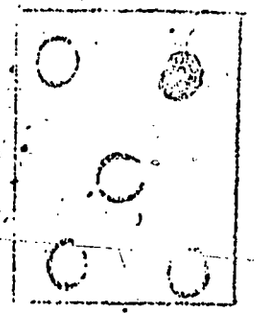
#5 Bunny

#6 Woman-Face

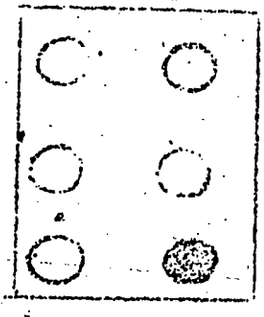
#7 Tree



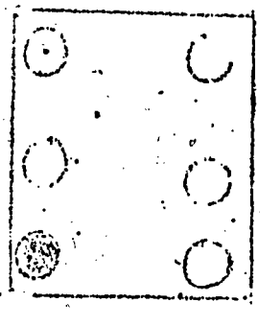
#8 Man - Face



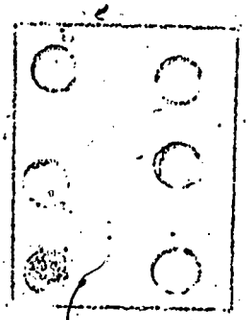
#9 Tractor



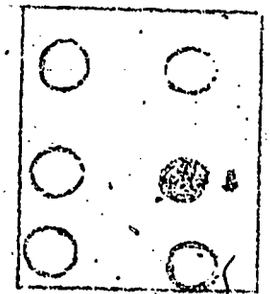
#10 Girl-Face



#11 Plane



#12 Boy-Face



Total Correct_____

Child's Name _____ Proc # _____

Activity

Puzzle or Block Related

Other

Time	Puzzle-Goal Direct	Puzzle-non Goal Direct	Other	Phonics	Blocks	Time	Comp. &/or Comments	P needs/	Quest. &/or Comments	Status
.33	pgd	pngd	other	P		.33	c &/or	fan	c &/or	fan
.66	pgd	pngd	other	P		.66	c &/or	fan	c &/or	fan
1.00	pgd	pngd	other	P		1.00	c &/or	fan	c &/or	fan
1.33	pgd	pngd	other	P		1.33	c &/or	fan	c &/or	fan
1.66	pgd	pngd	other	P		1.66	c &/or	fan	c &/or	fan
2.00	pgd	pngd	other	P		2.00	c &/or	fan	c &/or	fan
2.33	pgd	pngd	other		blks	2.33	c &/or	fan	c &/or	fan
2.66	pgd	pngd	other		blks	2.66	c &/or	fan	c &/or	fan
3.00	pgd	pngd	other		blks	3.00	c &/or	fan	c &/or	fan

Teacher's Ratings

Child's Name _____ Teacher's Name _____ School _____ Date _____

	5 Optimal	4 Good	3 Average	2 Fair	1 Poor	
Task Competence Rating						
Absorbed by task						Easily distracted
Persistent						Gives up easily, doesn't stay with
Eager to continue						Seeks to terminate
Challenged by hard tasks						Prefers easy tasks
Social Competence Rating						
Socially confident						Shy, reserved, reticent
Comfortable in adult company						Ill-at-ease
Assured						Anxious about success
Needs minimum of communication						Needs constant praise and encouragement
Kindergarten Prognosis						
Good conventional kindergarten prognosis						Poor conventional kindergarten prognosis

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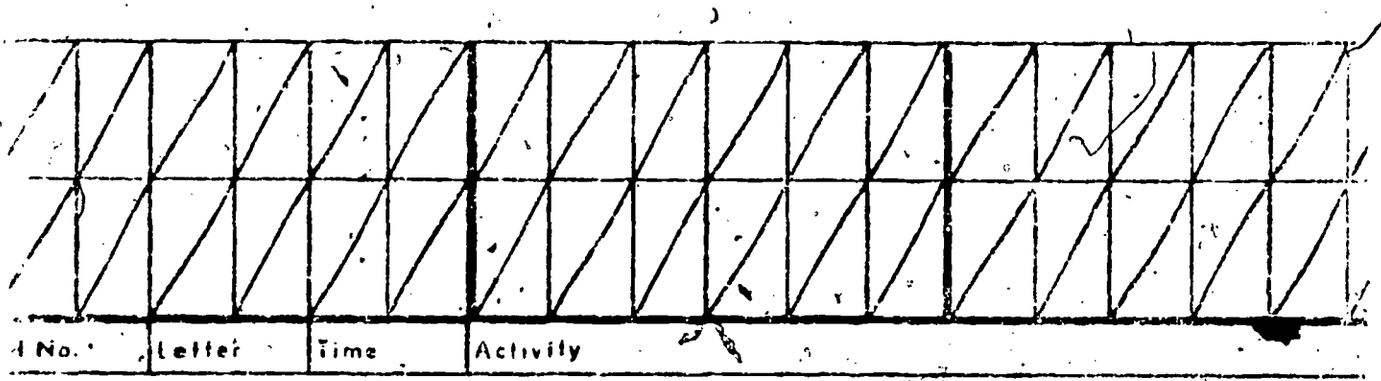
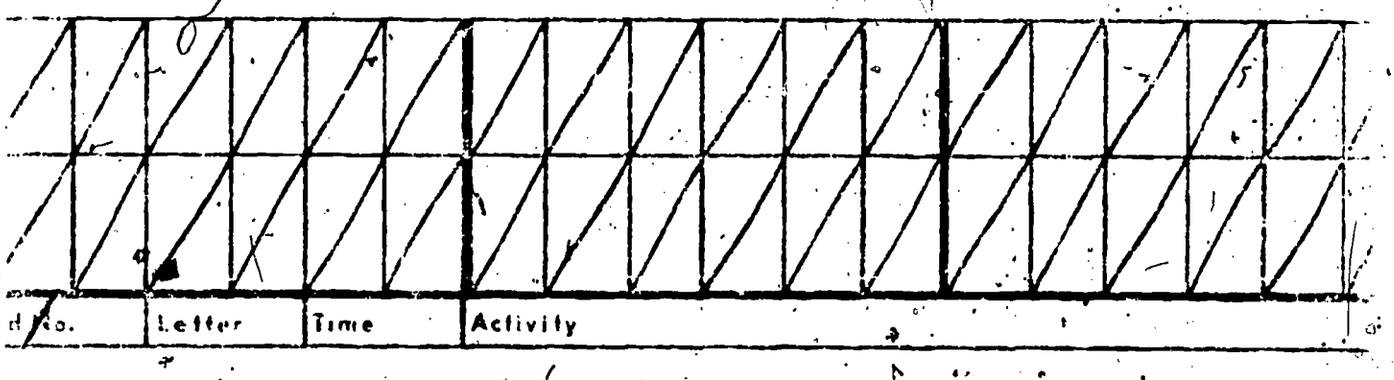
SOCIAL INTERACTION OBSERVATION FORM

...t R.	Center	Class	Obser.	Date	Session	Week of Center Oper..
					AM PM	

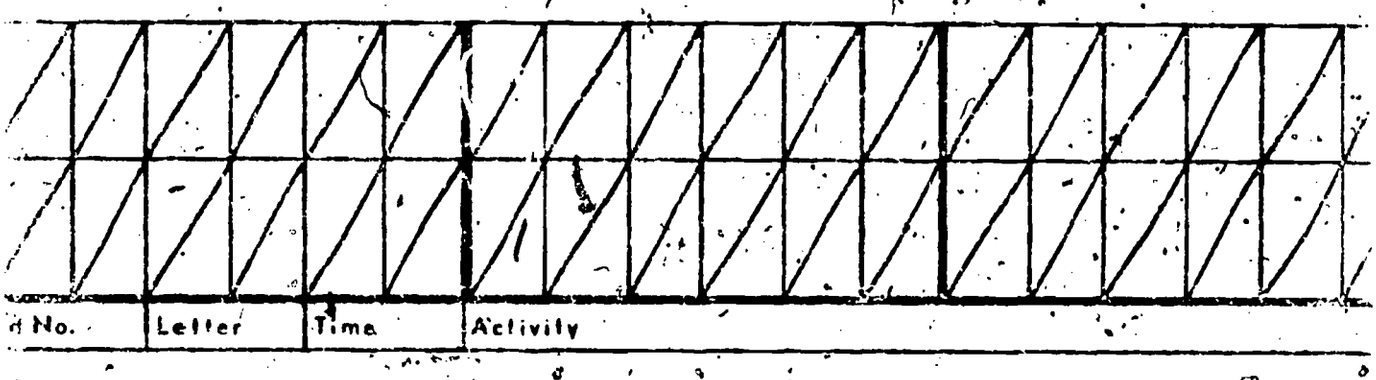
Minute 1			Minute 2			Minute 3		
...d No.	Letter	Time	Activity					



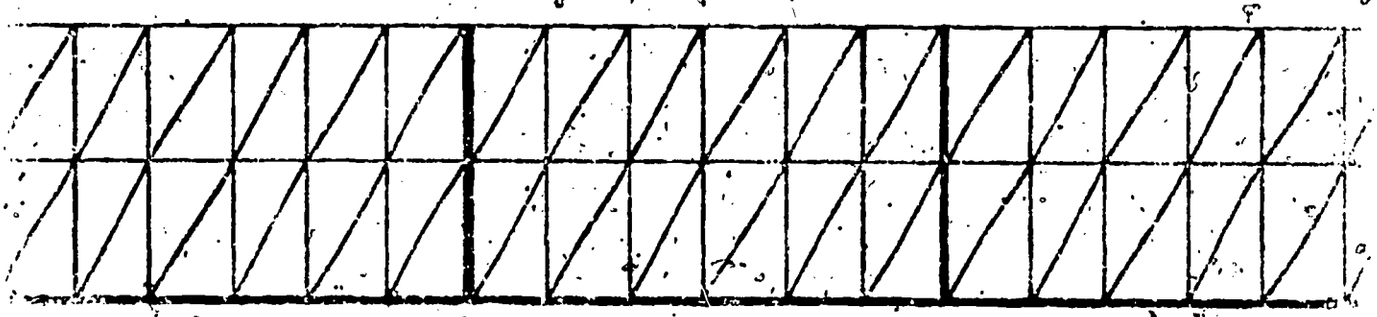
...d No.	Letter	Time	Activity



...d No.	Letter	Time	Activity



...d No.	Letter	Time	Activity



A6 A11
A7 A12
A8 AX
A9 AX
A10 AX

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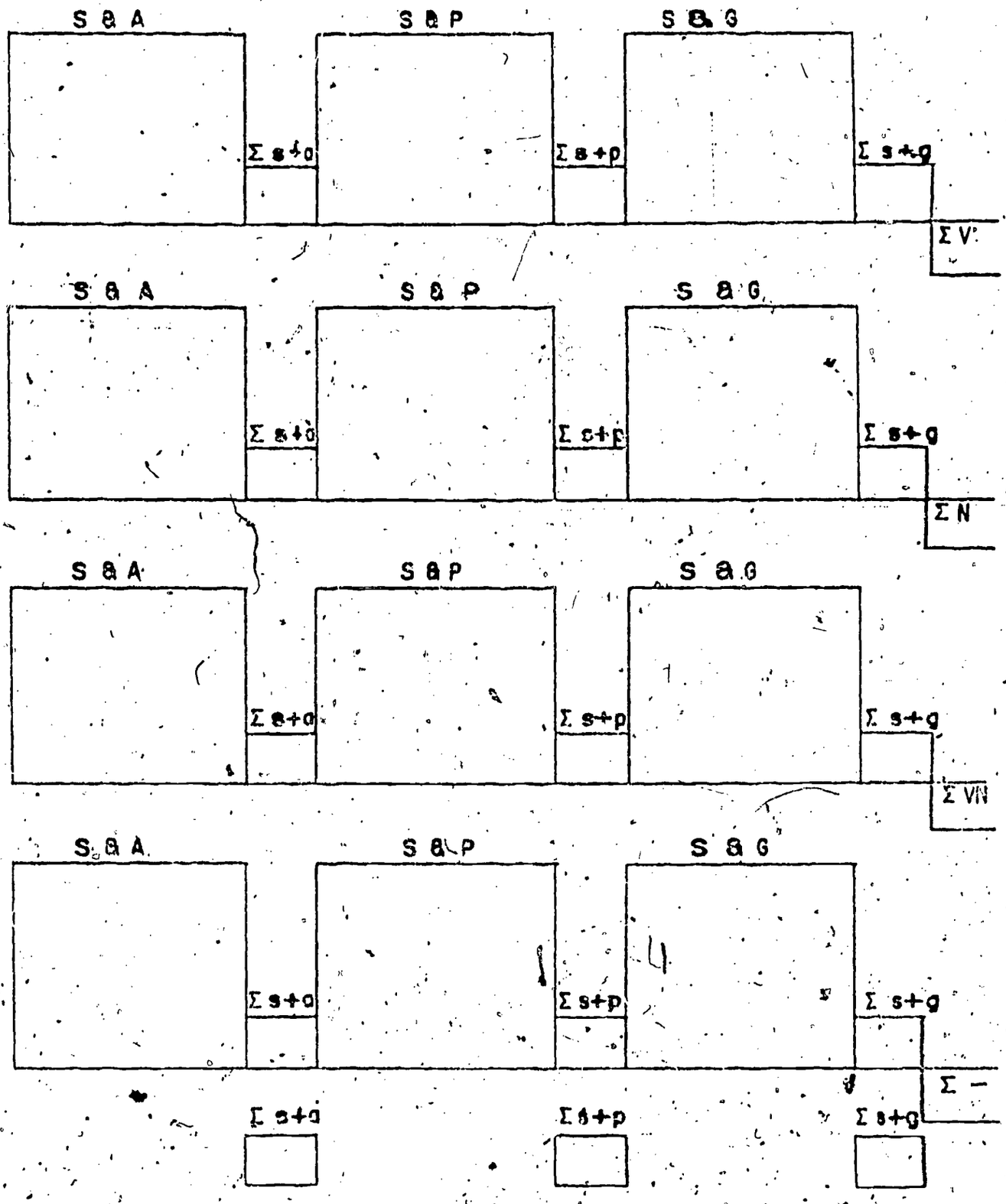
THE UNIVERSITY OF KANSAS HEAD START EVALUATION & RESEARCH CENTER
Department of Human Development

Interaction --- Master Data Form I

Circle when tallied and enter week of center operation in block below.

3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	min.



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Department of Human Development

Verbal and Nonverbal Behavior -- Master Data Form II

Circle when tallied and enter week of center operation in block below:

3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	min
												1			

INITIATION			RESPONSE			
Verbal	Nonverbal	✓	Verbal	Nonverbal	✓	(✓)

Total Verbal Behavior (IV + RV + ✓ + (✓)) =

Total Nonverbal Behavior (IN + RN) =

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Initiations and Responses -- Master Data Form III

Circle when tallied and enter week of center operation in block below.

3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	min.

INITIATION	RESPONDED TO	NOT RESPONDED TO	
SA	Σ	Σ	Σ SA
SP	Σ	Σ	Σ SP
SG	Σ	Σ	Σ SG
AS	Σ	Σ	Σ AS
PS	Σ	Σ	Σ PS
GS	Σ	Σ	Σ GS
AG	Σ	Σ	Σ AG
PG	Σ	Σ	Σ PG
	Σ R	Σ R̄	

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Adult Intervention -- Master Data Form IV

Circle when tallied and enter week of center operation in block below.

3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	min

INTERACTION	AV	AN	AVN	
S & P	Σ	Σ	Σ	Σ S & P
S & G	Σ	Σ	Σ	Σ S & G
S & A	Σ	Σ	Σ	Σ S & A
	Σ AV	Σ AN	Σ AVN	

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Interaction with Specified Individuals and Groups
Master Data Form V

Circle last tallied minute

3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 min

By S to Males

Peer	Initiations	ΣV	ΣN	ΣX	Duration	ΣV	ΣN	ΣX
B								
C								
D								
E								
F								
H								
I								
J								
K								
L								
M								
N								
O								
P								
Q								
R								
T								
U								
V								
W								
X								
Y								
Z								
Σ								

No. Males Initiated To = (1)

Total Duration with Males Init. To. =

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Department of Human Development

Interaction with Specified Individuals and Groups
Master Data Form V

Circle last tallied minute

3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 min

By S to Females

Peer Initiations	ΣV	ΣN	ΣX	Duration	ΣV	ΣN	ΣX
B							
C							
D							
E							
F							
H							
I							
J							
K							
L							
M							
N							
O							
P							
Q							
R							
T							
U							
V							
W							
X							
Y							
Z							
Σ		Σ			Σ		

No. Females Initiated To = Total Duration with Females Init. To =

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Department of Human Development

Interaction With Specified Individuals and Groups
Master Data Form V

Circle last tallied minute

3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 min

By Males to S

Peer	Initiations	ΣV	ΣN	ΣX	Duration	ΣV	ΣN	ΣX
B								
C								
D								
E								
F								
H								
I								
J								
K								
L								
M								
N								
O								
P								
Q								
R								
T								
U								
V								
W								
X								
Y								
Z								
Σ								

No. Males Initiating to S =

Total Duration with Males Initiating to S =

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Department of Human Development

Interaction with Specified Individuals and Groups
Master Data Form V

Circle last tallied minute

3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 min.

By Females to S

Peer	Initiations	ΣV	ΣN	ΣX	Duration	ΣV	ΣN	ΣX
B								
C								
D								
E								
F								
H								
I								
J								
K								
L								
M								
N								
O								
P								
Q								
R								
T								
U								
V								
W								
X								
Y								
Z								
Σ		Σ				Σ		

No. Females Initiating to S =

Total Duration with Females Initiating to S =

(4)

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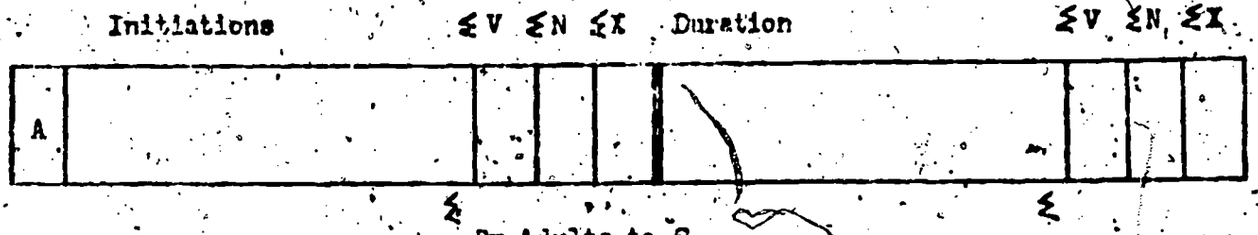
Department of Human Development

Interaction with Specified Individuals and Groups
Master Data Form V

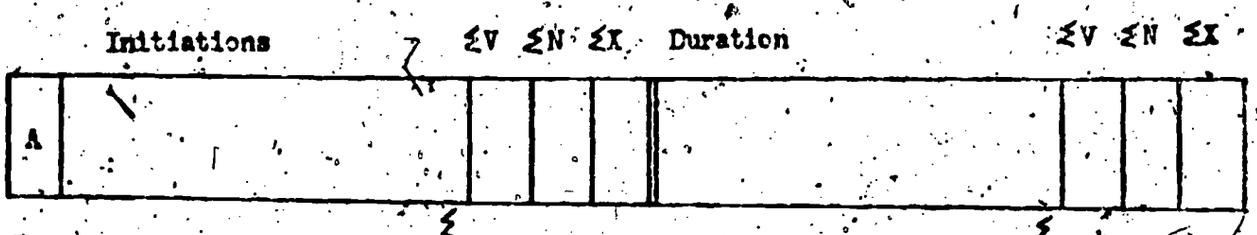
Circle last tallied minute

3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 min

By S to Adults

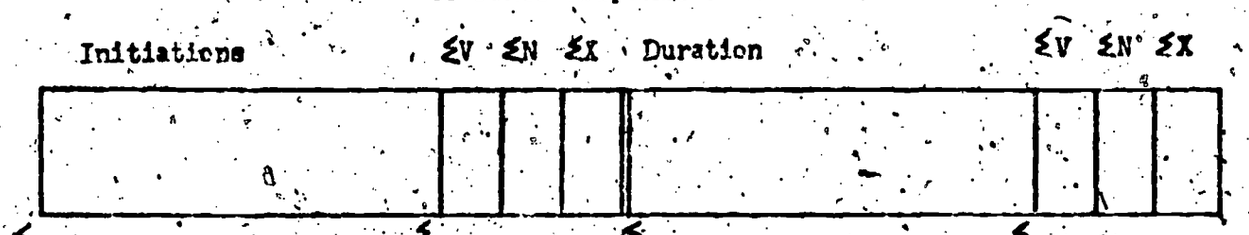


By Adults to S

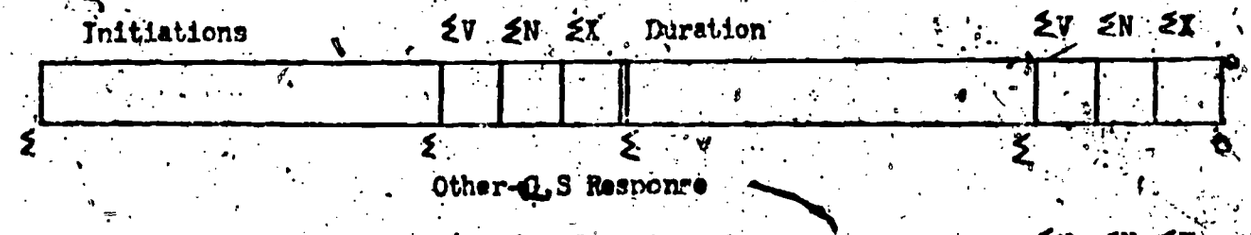


Following are Completed Interactions Only

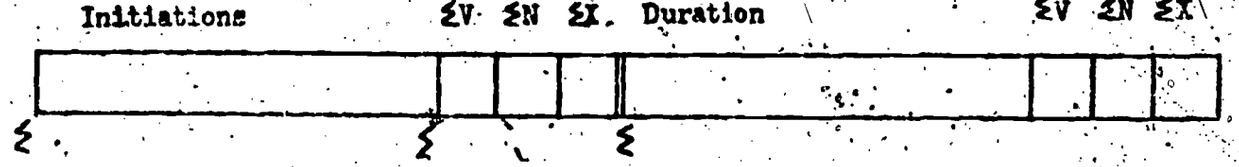
SG-Other Response



GS-S Response



Other-G,S Response



Total Adult Initiations =
Total Adult Duration =
Total No. Males Interacted With =
Total No. Females Interacted With =
Total No. Peers Interacted With

Duration with Males =
Duration with Females =
Duration with Peers =
Overall S Duration =

Name_____ Center_____ Pre Post

Response	No. of Words	(1) Question (2) Statement	(1) Ego Directed (2) Soc. Directed	(1) Initiation (2) Response to Others (3) To Self	TYPE OF SENTENCE (1) Nonsense (2) S-V; (3) S-V-O (4) S-V-O, Phr. (5) Compound	Total No. Sentences
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Quality of Voice: (1) Understand 0-20% (2) 20-40% (3) 40-60% (4) 60-80% (5) 80-100%