5-1974

Effects of an Instructional Program on Concept Attainment of Middle-Class Pre-Kindergarten Children

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EFFECTS OF AN INSTRUCTIONAL PROGRAM ON CONCEPT ATTAINMENT OF MIDDLE-CLASS PRE-KINDERGARTEN CHILDREN

by

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A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Family and Child Development

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UTAH STATE UNIVERSITY
Logan, Utah

1974

ACKNOWLEDGMENTS

I wish to express appreciation to the many people who have encouraged and helped me in the preparation of this thesis. I am especially grateful to Dr. Carroll Lambert, my major professor, for her guidance and support. I also extend my sincere thanks to Dr. Don C. Carter and Professor Farrell J. Black for their time and guidance in helping me to complete this study.

I wish to thank the children who participated in this study for their delightful and enthusiastic cooperation.

I wish to express a special thank you to my family for their sacrifices and understanding without which this study could not have been completed.

Joan S. Ross

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ABSTRACT

Effects of an Instructional Program on Concept Attainment of

Middle-Class Pre-Kindergarten Children

by

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Utah State University, 1974

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The objective of this study was to determine if a highly structured instructional program, as a supplement to a more traditional pre-school program would have an effect on the concept attainment of pre-school children. Two groups of eighteen pre-school children, enrolled in the Child Development Laboratory at Utah State University comprised the study sample.

The eighteen children in the experimental group received the instructional program, in addition to the Child Development Laboratory school experience. Standardized pre and post tests were administered to both the experimental and control groups. A standardized test, The Boehm Test of Basic Concepts, was utilized.

An hypothesis of no difference was used to guide this study. The results of the study indicated that a statistically significant difference did exist in comparing the post test scores of the two groups; thus the hypothesis of no difference was rejected. Although the results obtained were of statistical significance, the numerical value of the differences was very small.

In examining variables within the experimental group, it was found that age, sex, verbal participation, and laboratory school experiences affected the study results.

(80 pages)

CHAPTER I

INTRODUCTION

Following many years during which interest in pre-school education was quite minimal, there has been a resurgence of concern with early childhood learning. The burgeoning Montessori school movement, Project Head Start and Home Start, and the many other federal programs for disadvantaged youngsters all over the nation give evidence to the rising interest in early childhood education (Elkind, 1969).

Historically, nursery schools were not originally conceived as a learning situation for the very young child. When the first nursery schools opened in England, which predated the movement in our country by ten years, the emphasis was on improvement of health. In 1911, when Margaret McMillan, the founder of the nursery school movement, opened her school in a London slum, her central concern was with fresh air and three good meals a day aimed at improving the health of the children. Education of the children was considered, but only as a minor aspect of the program (Eliot, 1972).

A few years later, in Rome, Maria Montessori's Casa dei Bambini attracted attention because she advanced the notion that very young children are not only capable of, but eager to learn. Her school, opened in the slums of Rome, focused on learning by means of utilizing the child's senses (NAYAC, 1971).

A decade later, the nursery school movement came to the United States. Shortly after these first schools were founded, Dr. Arnold Gessell wrote in 1924, "The educational ladder of the American public school is a tall one and a stout one, but it does not reach the ground. It does not have a solid footing." (Eliot, 1972) What he meant, of course, was that the years between infancy and entry into school had been sadly neglected by American educators.

Those early nurseries in America were profoundly affected by the work of Gesell along with the psychoanalytic theories of Freud and the educational philosophy of Dewey. In those schools, the focus was on the emotional and social development of the child. Cognitive development was not a prime concern (Eliot, 1972).

Following the depression years, interest waned in the early childhood movement primarily due to the financial crises experienced by most families. The decade of the 60's brought renewed interest in pre-school education. Some writers feel that this was due, in part, to very practical concerns. In the early fifties a great deal of criticism was leveled at the American educational system for not adequately preparing children for life in the scientific age. When the Russians launched Sputnik in 1957, this seemed to lend credence to those remarks. Public opinion was putting a great deal of pressure on the educational system to respond to the challenge of intensified efforts to "catch up" with the Russians. Pre-school education was not immune from the

criticisms, and nursery schools were chided for allowing children to play rather than moving them into the attainment of academic skills (Elkind, 1969).

The other major factor in the rebirth of interest in pre-schools was the many federally funded compensatory programs for disadvantaged children. These programs were conceived for the purpose of giving the poverty child the necessary skills to catch up with middle-class children before entry into school (Elkind, 1969). These compensatory programs of the mid-sixties were very diversified in their approach and objectives. The programs ran the gamut of educational approaches from the traditional nursery school with emphasis on the whole child approach to the highly structured programs based primarily on the theories of behavioral psychology and aimed primarily on the fostering of cognitive skills (Maccoby, 1970).

The diversity of these programs soon led to a great deal of controversy as to what the purposes and methods of a pre-school program ought to be.

This rather brief background of the pre-school movement is presented to demonstrate influences and trends in pre-school education today. Pressure is now being exerted to increase instruction and the development of cognitive skills for middle-class children as well as for the disadvantaged child (Pines, 1967). The issue of fostering cognitive skills versus the whole child approach has become one of the most controversial topics in the field of early childhood education. The theories of behavioral psychology have also had a profound impact on early childhood education.

At the heart of the matter is a basic conflict among differing schools of thought. There are those who advocate structured, formalalized instruction, based on extrinsic reinforcement and motivation, versus those who favor the more traditional unstructured, enriched learning environment, based on intrinsic motivation. The latter group favors a multi-sensory approach wherein learning takes place via interaction with the environment. The child's emotional, social and physical development is considered to be of equal importance to his cognitive development. At the other end of the educational spectrum are those who advocate focusing on only the cognitive aspects of the child's pre-school experience. It is the contention of practitioners of this view point that children, especially disadvantaged children, need more specific, formalized instruction in order to develop cognitive skills.

A third point of view, which is new but also supportive of earlier expressions of pre-school educators, maintains that excessive concern is being directed toward cognitive development, in contrast to the child's self-concept (Zigler, 1970). It may be seen, then, that the issue is complex, and that any time a group of early childhood educators meet this topic is likely to be discussed, and, frequently, hotly debated.

Statement of the Problem

The problem is that while there is substantial evidence to demonstrate the efficacy of more highly structured programs of instruction for children in need of remediation such as the disadvantaged or the retarded, there is

disagreement as to their emphasis on cognition (Zigler, 1970). There is also a lack of agreement regarding the use of these programs with the middle-class child (Kofsky, 1967; Karnes, 1968; DiLorenzo, 1968; Edwards and Stern, 1970).

Despite conclusive research evidence as to advantages or disadvantages, highly structured instructional programs are being widely advocated for middle-class children. This is based largely on the assumption that if these programs are of benefit to the child in need of remediation, they can also greatly enhance the learning potential of non-remedial children. In preparing a curriculum for advantaged middle-class pre-schoolers, teachers have very little research evidence to look to for guidance.

Statement of the Purpose

The purpose of this investigation was to examine the effects of a highly structured instructional program on a specific area of cognitive development of pre-school advantaged children. A comparison was made with a more traditional, unstructured pre-school program. This investigation focused specifically on the area of cognition which involves the learning of concepts relating to positional prepositions.

Hypothesis

The following hypothesis was examined:

No statistically significant differences will be found between the scores attained on a standardized test by the group of children receiving the structured tutorial program, in addition to the traditional pre-school program, as compared to the group of children who do not receive the instruction.

Definition of Terms

Definitions are for terms as they will be used in this investigation:

1. formalized instruction program--a highly structured sequential program; teacher-directed, wherein teacher directs learning; verbal level only, extrinsic motivation through the use of verbal reinforcement; children work in small groups.

2. traditional pre-school curriculum--relatively unstructured learning environment; child-centered, wherein child directs his own learning with teacher guidances, if needed; individualized to each child; child employs all senses; manipulation of materials; verbal learning reinforced by concrete experiences; primarily intrinsic motivation.

3. positional propositions--for the purposes of this investigation limited to include the following: top, next to, inside, behind, by the side of, below and above.

CHAPTER II

REVIEW OF LITERATURE

A review of literature reveals the intense interest in recent years in the issue of the cognitive development of the pre-school child. As related to the topic to be investigated, the literature focus is on two main areas: theories of cognitive development and the application of the theoretical framework to curriculum.

Cognitive Development Theory

In the area of cognition, the work and theories of the Swiss psychologist, Jean Piaget, permeates the research literature. In the last decade, his influence has been most profound. Advocates of early cognitive stimulation, as well as their opponents make reference to Piaget's theories, as well as adapting them to very different viewpoints.

Many researchers such as Bruner, Oliver, Greenfield, and J. M. Hunt interpret Piaget's ideas from what is referred to as a cognitive developmental approach (Kohlberg, 1968). They, with others, hold that any intellectual skill can be taught early if the teaching is adapted to the level of the child's development. The development of intelligence passes through stages, "critical periods," when the child is especially sensitive to environmental influences, according to this viewpoint (Elkind, 1971; Chittende, 1969; Hymes, 1968). Stress is placed on the interaction between the organism and environment,

both aspects contributing equally in importance (Kohlberg, 1968; Deutch, 1964; Hunt, 1964; Sonquist and Kamii, 1964).

On the other end of the scale is the child development tradition of pre-school education. Advocates of this point of view see Piaget's ideas as part of a body of maturational theory (Gesell, 1954; Issacs, 1933; Kohlberg, 1968). Advocates of the maturational point of view perceive the child as passing through unfolding maturational stages, based upon inner time clocks. Efforts to teach or force early maturation are thought to be ineffective or highly disruptive to the child's total pattern of growth. Emotional, social, and intellectual growth is seen as a process involving the whole organism. In this context it is held that pre-school educators should just let cognitive abilities grow, and that the teacher should concentrate upon helping the child to adjust and develop socially and emotionally (Brody, 1958; Kohlberg, 1968).

A third school of thought stresses the environmental aspects. John Lock, J. B. Watson, and B. F. Skinner pioneered the view that the structure of behavior, including cognitive behavior, is the result of environmental influences (Kohlberg, 1968). Developmental schemes and maturational levels are considered irrelevant to the cognitive process because the focus is upon instruction. According to this viewpoint, concept learning occurs through stimulations from the environment, the child's response and the specific reinforcement of that response. It is held that it is possible to teach children any behavior pattern, including cognitive behavior, so long as the laws of

association and learning are applied (Kohlberg, 1968; Englemann, 1964, 1969; Bereiter and Englemann, 1964).

Application of Theoretical Framework to Curriculum

Much research in the child development field has been directed toward determining how valid various theoretical constructs are when applied to pre-school curriculum. The interest in recent years in formalized instruction, particularly for the disadvantaged pre-schooler, has stimulated a great deal of study in this area. Attempts to generalize the benefits to disadvantaged children suggested by this research to middle-class advantaged children has not been validated by similar amounts of research to date. A summary of this research illustrates this contention.

Brottman (1968) studied three approaches to teaching language to disadvantaged pre-schoolers. The approaches ranged from the unstructured, emphasizing social and emotional development, to the semi-structured involving games, to a highly structured approach emphasizing language drills. The results demonstrated no clear advantage of one approach over another. In another study of approaches to language development and related intellectual functioning, Karnes et al (1968) examined the effects of a highly structured program. The program utilized small group instruction, stressing language and cognitive development. Post-test results showed substantial gains in these areas. No comparison was made with any other type of program.

Edwards and Stern (1970) studied the effects of a structured, task-oriented language program on the cognitive and linguistic abilities of pre-school Anglo-American, Mexican-American, and Afro-American children. Results showed significant gains in these skills at the end of the program. Gains were greater for the Anglo- and Mexican-American children than for the Afro-American. No comparison was made with any other type of program.

The effects of modeling as compared to direct instruction on the speech patterns of pre-school disadvantaged children were studied by Stern (1969). One group of children was exposed to good speech models; teachers and aides. A second group of children was given a direct instructional program in speech patterns. Post-test results indicated the modeling approach yielded substantially better results than did the direct teaching approach.

Kofsky (1967) studied the effects of verbal training on concept identification of disadvantaged pre-schoolers. He found that children who received the verbal training did better than those who did not receive training in the area of inductive concept attainment, but had no greater success in solving concept tasks than the non-trained group.

In a study of reading readiness, Williams, Gilmore and Malpass (1968) examined three teaching methods. Disadvantaged children identified as slow learners were taught readiness skills via teaching machines, programmed instruction and conventional classroom instruction. The skill gains were superior in the teaching machine group; next greatest gains were in the

programmed instruction group and gains were poorest for the group receiving instruction by conventional methods.

A study by Denmark and Guttenberg (1969) examined the effects of integrated and non-integrated programs on children's cognitive development. Disadvantaged, black pre-schoolers in four different intervation programs were compared with control groups before and after treatment. The intervention programs ranged from highly structured to highly unstructured. Results indicated that neither the program content nor the presence of white middle-class children was significant in determining cognitive improvement. The length of time the child spent in the program proved to be the most important factor in cognitive growth.

In an evaluative study of pre-kindergarten programs for disadvantaged children (De Lorenzo and Salter, 1968) 1,235 subjects who had been involved in these programs were followed up two years later. Several types of programs were studied, and a comparison was made with children who had had no pre-kindergarten experience. All children who had had any of the pre-kindergarten experiences showed gains on I.Q. tests, and language development and reading readiness tests as compared to the non-program children. Among the program children, gains were greatest among children in the most highly structured, task-oriented programs.

A follow-up report of a pre-school intervention program designed to offset the progressive mental retardation of inner-city children was done when the children were in the fourth grade (Gray and Klaus, 1970). The

program consisted of a summer Head Start program and home visits the rest of the year. When compared with a non-program control group, the program children remained higher in I.Q. test scores, but had remained the same as non-program children in language skills. A great deal of structured teaching had been the central focus of the Head Start program.

Four different pre-school intervention programs for disadvantaged children were studied in regard to their effects on development of cognitive and language skills (Karnes, Teska, and Hodkins, 1970). The children in the four programs were pre and post tested. The programs included all levels of structure from a more traditional unstructured program to a highly structured program. Results favored the programs with the most structure and direct instruction.

Almy and Miller (1966) in examining the effects of structure upon cognition, found little or no evidence that instructional programs had any effect on the development of logical operations.

Summary of Review

A summary of this research indicates the lack of information regarding the effects of highly structured programs on the concept development of the advantaged, non-remedial, middle-class child; thus indicating the need for further research in this area.

A summary of this research also illustrates that, while some studies do indicate favorable results in utilizing more highly structured programs

with the disadvantaged child, the research, to date, indicates that there also is no overwhelming or conclusive evidence that any one type of program is definitely superior to any other.

CHAPTER III

PROCEDURE

Selection of Sample

Two groups of eighteen children served as study subjects. The purposive sample was selected from among the 80 children enrolled in the Child Development Laboratory School at Utah State University. Children were selected for the study sample on the basis of the following criteria:

1. Children who would be enrolled for two consecutive quarters.
2. Children who had been pre-tested utilizing the Boehm Test of basic concepts.

The children who attend the Child Development Laboratory School live in the Cache Valley area of northern Utah. Some of them are the children of college students; some are children of faculty members at the university, and the others are from local families of various occupations and professions. The majority of these children come from middle-class backgrounds. The average age of the study sample children was four years six months. The experimental group was made up of eleven girls and seven boys. The control group consisted of twelve boys and six girls.

Description of Test Instrument

A pre and post test was administered to subjects in both groups. The Boehm Test of Basic Concepts (Ann E. Boehm, 1970) was used as the test

instrument. This is a diagnostic test consisting of two parts which measures concept attainment. There are fifty items in the test which may be administered verbally. (See Appendix B.)

Reliability

The reliability coefficient may range from zero to 1.00 with higher values indicating greater reliability. The reliability coefficients for the Boehm Test of Basic Concepts total score range from .68 to .90.

Validity

An essential aspect of the validity of a test is how well the test performs its work. For the BTBC, like any other test of educational mastery, validity is primarily a matter of relevance of the test to the school curriculum. This type of validity is usually called content validity. In the case of BTBC, the test items were selected from relevant curriculum materials and represents concepts basic to learning in the pre-school and primary setting (Boehm, 1970, p. 17).

Administration of the Test Instrument

The pre and post test was administered by graduate assistants from the Department of Family and Child Development at Utah State University.

The graduate assistants who administered the tests were given careful training by faculty members in an effort to achieve a standardized approach in test administration.

The pre test was not administered until the children had had time to adjust to the Child Development Laboratory experience and felt comfortable in their surroundings. The pre testing was begun after the children had been in the Laboratory program three weeks.

The post test was conducted while the children were still enrolled in the Laboratory program so that they were again tested in familiar and comfortable surroundings.

Methods and Setting

The group of laboratory school children in the Control group was exposed to a traditional pre-school curriculum. The Child Development Laboratory serves a dual purpose. One purpose is that of providing children with experiences to foster cognitive, social, emotional and physical development. The other function is that of teacher training. Four student teachers work in each classroom, supervised by a member of the Utah State University Child Development faculty who is the head teacher.

The daily schedule in the laboratory is flexible, depending upon the plans made by the teacher in charge. Student teachers are responsible for planning the activities on a rotating basis, under the supervision of the head teacher. The children work in small groups, or on an individual basis in a

free play situation, or they may be brought together as a whole group for stories, an art, music, food, or science experience, a visitor, or juice time.

Part of each day is spent in free play during which the child may choose the type of activities in which he wishes to become involved. The cognitive aspects of the curriculum are focused upon learning by concrete experience through manipulation of equipment, books, or sensory materials and by other experiences such as science activities, visitors, and excursions. Learning is also encouraged by the use of creative dramatics, stories, group discussions, and role-playing in the housekeeping area and block corner.

The children in the Child Development Laboratory are exposed to concrete experiences as a basis for concept development. Emphasis is on direct observation, active involvement, motor responses and manipulation of objects. Materials such as unit blocks, sensory material, stories, the Matrix board, manipulative equipment and other pre-school materials are used to provide these learning experiences. The children are encouraged to use all their senses in the learning transactions.

The activities, while planned carefully by the teachers, are essentially child-directed.

Children attend the laboratory school four days per week, Monday through Thursday for two and one half hours each day.

The Children in the Control group attended school in the morning and children in the Experimental group attended in the afternoon.

The children in the Control group received no special treatment regarding positional prepositions.

In addition to the traditional pre-school curriculum, the children in the Experimental group were exposed to a highly structured tutorial program (Appendix A). During the periods of free play, the writer would ask a group of five or six children to come into the next room to play a game. The children were involved in the tutoring sessions for not more than seven to ten minutes, twice a week for six weeks.

The writer and the children went into a room near the classroom. It is a long narrow room approximately ten feet long and five feet wide. The room contains a small cupboard, a sink and a long bench upon which the children were seated, facing the writer. The writer was seated on a chair, beside a large flannel board. Visual aids utilized in the tutoring program were placed on the flannel board. The children remained seated, in a row, on the bench during the instructional period. Following the period of instruction, the children were returned to the classroom.

The Instructional Program

The instructional program was designed by the writer by using a Distar Type program (Research Associates, Palo Alto, 1971) as a model and adapting it to the purpose of instruction in the following prepositional concepts: next to, inside, behind, by the side of, below, above and on top. It was the writer's intent to choose an instructional program based totally on verbal instruction

and group verbal responses. The children did not manipulate any of the instructional materials and did not at any time initiate the exchanges with the instructor. The program is highly structured and sequenced. A high rate of verbal reinforcement is included in order to encourage children for making correct responses. Elements such as talking loudly, talking fast, the "fooler" game, and the "not" game were included as part of the program in order to sustain the children's interest. (See Appendix A for exact wording of the instructional program and for examples of the "not" and "fooler" games.) (Bereiter and Englemann, 1964)

Reliability of Instructional Program

The reliability of the instructional program was controlled for by maintaining constancy in the experimental setting, the instructional procedure, and the writer's behavior in interacting with the children. All instruction was conducted by the writer. Verbal instructions to the children were presented to each group of children in a consistent manner. At the conclusion of each session with each group of children, a written record was made of the session.

The writer attempted to maintain constancy of response in each session. Binder, McConnell and Sjoholm (1957) noted the importance of the interpersonal relationship between subjects and examiner as an important variable. According to these findings, the subjects' responses are influenced by their physical environment as well as the examiner's behavior. Krassner (1957) also found that the behaviors of the examiner such as gestures, smiling,

nodding, and posture were important reinforcers to the subjects and influenced their responses in the experimental situation.

The writer attempted to control for this variable by striving to maintain a consistent posture, facial expression, and to be constant in verbal responses and social reinforcers during the experimental period.

Pilot Study

Seven children, three girls and four boys were selected at random from among the two afternoon Child Development Laboratories at Utah State University. The sample was controlled to the extent that children selected for the pilot study would not be included among the main study sample. The pilot study was made for the purpose of trying out the instructional program. During free play periods in the classroom, a small group of children was asked to accompany the writer to another room for the purpose of playing a game. A room near the classroom was used for each session. After a brief introductory period of talking to the children to make them feel at ease and to learn their names, the children were then introduced to the task using the following procedure:

> The children were seated upon a long bench facing the writer. A pellon cut-out of a table was placed upon the flannel board.

Writer: What is this?

Children: A table.

Writer: Say the whole thing, this way. This is a table.

> The writer continued the question until the children responded with a whole sentence. The children were then instructed to say it fast and to say it loudly. These instructions were included to create and sustain interest. Correct responses throughout the sessions were lavishly praised by the writer as a method of social reinforcement. A pellon cut out of a ball was then placed upon the flannel board.

Writer: What is this? Say the whole thing.

> The writer continued asking the question until the children were responding in whole sentences. Instructions to say it fast and say it loudly were once again given.

The session was terminated at this point as the purpose of the first session was primarily to introduce the children to the program and to acquaint them with the procedure.

Second session

The writer placed the pellon cut out of the table on the flannel board. The children were then asked to identify the object in the manner of the introductory session. The same procedure was then followed with the ball cut out. This was primarily a warm-up. Next, the writer placed the ball cut out on top of the table. The children were asked to give the position of the ball. Whole sentence responses were required. Verbal reinforcement was given for each correct response. The ball was next placed below the table, above the table, and by the side of the table. Each position was dealt with as a separate entity. The writer did not go on to the next concept until the

children were responding in whole sentences to the previous concept. The following is an example:

Writer: Where is the ball?

Children: On top of the table.

Writer: Say the whole thing. Where is the ball?

Children: The ball is on top of the table. (Correct response)

Writer: Very good. You said the whole thing. Aren't you smart today.

The second session reinforced the first session and established the procedures in the children's minds enabling them to participate better.

Third session

During the third session the concepts inside, behind, and above were presented following the same procedure as the two previous sessions. Concepts from the second session were then reviewed. Children continued to receive a high rate of verbal reinforcement from the writer for correct responses.

Pilot study results

On the basis of the pilot study, it was decided that the children could easily be exposed to two or three new concepts a session once they had become familiar with the routine. It was further determined that in a session lasting much beyond seven to ten minutes, children became restless and began to lose interest in the task. Children were expected to respond to the questions

as a group. Some of the children in the study sample would not respond during the first session, but came around by the second or third session. One child in the pilot study refused to respond during any of the sessions, but sat silently watching and listening to the others.

The results of this pilot study indicated that the instructional program as designed by the writer would lend itself well to the purposes of the main study and the decision was made to continue the research. (See Appendix A for full text of instructional program.)

Main Study

The instructional program was administered to the eighteen children in the Experimental group during a six-week period. The children in this group were exposed to the program twice per week, on alternate days. Each tutorial session lasted from seven to ten minutes. All children received a total of twelve instructional sessions. These children were exposed to the regular laboratory school program during the time when they were not receiving the instructional treatment.

The writer entered the classroom of the Experimental group children during free play periods. The writer had previously spent time in each of the classrooms for the purpose of becoming acquainted with the children. A small group of children, five or six, were approached by the writer and invited to go into another room to play a game. Only one child refused this request, but eventually joined the second group when two of his friends did.

The writer and the children went into a separate room. The writer was seated on chair, beside a large flannel board. The children were seated upon a long, low bench, facing the writer. The children remained seated, in a row, on the bench during the instructional period. This was the same procedure as followed during the pilot study. Visual aids utilized in the instructional program were placed upon the flannel board. These aids consisted of pellon cut-outs in the shape of a table, a ball, and a box. (See Appendix A.)

Level I

Level I of the instructional program was administered over a four-week period and consisted of eight sessions for each child.

The positional prepositions taught during the instructional period included the following: next to, inside, behind, by the side of, below, above, and on top. Level I of the instructional program consisted of the introduction of the positional prepositions. Two to three preopositions were introduced per session. The beginning of each session consisted of a review of the previous instructional period. No new prepositions were introduced until the children demonstrated to the writer that they had learned the ones already presented.

First week. During the first week, sessions #1 and #2, the prepositions on top, below and above were introduced. Session #1 was primarily an exploratory session spent in becoming familiar with the children, learning their names and acquainting them with the instructional program. Many of

the children were reluctant to participate. They were confused in regard to following instructions, especially responding in whole sentences.

By session #2 the children were more relaxed and at ease in the tutoring situation and thus were better able to participate. The children demonstrated good retention of the prepositions introduced in the previous session, but the majority of the children still required verbal cues and prompting from the writer. A high level of verbal and social reinforcement was given for each correct response. It was necessary to remind the children to respond in whole sentences. There was a tendency to respond to the writer's questions in sentence fragments. Several children in each group were reluctant to participate in the verbalization and merely sat listening to the others.

Second week. During the second week of the instructional period, the prepositional concepts inside and next to were introduced. A portion of each session was devoted to review of concepts introduced in previous sessions: on top of, below, and above.

By session #3, some of the children who had not participated verbally were beginning to speak; however, there were still one or two in each group who merely sat and listened. The children who were responding were beginning to respond in complete sentences quite consistently. The children seemed to enjoy the variety in saying their responses loudly and saying them fast. These devices proved to be key elements in helping to maintain the children's interest throughout the instructional period.

By the fourth session most children were participating with a fairly high level of enthusiasm and many of them showed a great deal of concern about making mistakes. The children demonstrated good retention of concepts in the review segment, but there was some confusion between the concepts by the side of and next to. The children began to prompt each other at this session and to urge the one or two who were not participating to join in.

Third week. During the third week, no new concepts were introduced because the children were evidencing some confusion between the concepts next to and by the side of.

Session #5 and session #6 were devoted to review and to clarification of the confusion regarding next to and by the side of. The confusion seemed largely due to the tendency for the children to use the word beside instead of by side of. By these sessions, the children were more relaxed about participating and would often precede me into the testing room. Responses in whole sentences had become quite automatic and the number of children remaining non-verbal had leveled off. The same children who had been non-verbal during previous sessions still remained silent the majority of the time. The highly verbal children tended to be quite helpful in drawing out the less verbal children. The highly verbal children sometimes presented a problem in that they often would interrupt the instructional program by attempting to engage the writer in conversation. The writer dealt with this by spending some time at the conclusion of the sessions to chat informally with the children.

Fourth week. During the fourt week, the preopositions behind and inside were introduced. A portion of each session continued to be devoted to review of the preopositions, by the side of, next to, on top of, below and above.

During session #7 a review of by the side of and next to indicated to the writer that some confusion still existed but this seemed to be primarily due to problems in labeling. The children wanted to substitute the word beside for the words by the side of, but appeared to understand the positional concept involved. During this session the writer had grouped children from two different laboratory classrooms together. In previous sessions, only children from the same classroom were brought together for instruction. This grouping had a negative effect in that some children who had been participating were reluctant to join in. The children tended to watch each other and not to attend to the writer. Due to this experience, the children were not mixed in future sessions.

By session #8 two children who had been quite eagerly participating remarked that they did not like playing the game. The stimulus of talking loudly and talking fast did not elicit the same responses as this device had in earlier sessions and several of the children appeared bored and restless. Over-all the children demonstrated good retention of the seven prepositions introduced. At the conclusion of session #8, the writer decided to proceed to Level II of the instructional program.

Level II

Level II of the instructional program consisted of the introduction of the "not" game and the "fooler" game. Each child received a total of four sessions at Level II. All seven prepositions were reviewed each session. At this level the objective was to reinforce the learnings of Level I. The "not" and "fooler" games were used to maintain the children's interest, and for review purposes. Some time at the beginning of each session was devoted to review. The "not" and "fooler" games were not used following this review.

Fifth week. The "not" game was introduced at session #9. Some of the children had difficulty in grasping the concept of "not." However, the stimulus of the "not" game helped to renew the children's interest and responses were rather lively. The children were responding quite consistently in whole sentences. The same children who had been non-verbal in the earlier sessions still sat silently watching the others, but would occasionally respond, especially if they were prompted by the other children. Some of the more verbal children began to respond with silly answers near the end of the session.

During session #10, a number of the children were still having difficulty with the "not" concept. Responses were good during the review portion of the session and the children demonstrated good retention of the language labels. The one exception continued to be the tendency of children to say beside in place of the correct response, by the side of. The children became quite restless near the end of the session and frequently appeared bored. Some silly answers were given as responses.

Sixth week. During the sixth week of the instructional program, the "fooler" game was introduced. The "not" game was also used as a means of reinforcing and reviewing the preopositions.

During session #11, the "fooler" game was introduced. The children did not have the problem in adjusting to this as they had with the "not" game. The majority of the children seemed to enjoy the stimulus of the "fooler" game. About one-fourth of the children were still showing some confusion in regard to the "not" game and did not respond correctly to this portion of the instructional session. Despite the use of the "not" and "fooler" games, interest began to lag near the end of the session. The children once again began to fidget, give nonsense responses, and some stated that they did not want to play the game any more.

During session #12, the majority of the time was devoted to a review of the prepositions introduced in Level I. The children continued to demonstrate good retention of the language labels. Responses were consistently in whole sentences. The children had begun to fidget near the beginning of this session and remained somewhat restless throughout the remainder of the session. There was noise in the hallway outside the testing room, and this may have been distracting to the children.

Analysis of Data

An analysis of variance was used to determine if there was any significant difference between the scores attained on the pre and post tests by the experimental group as compared to the control group. An analysis of covariance was used to compare pre and post test scores of both the experimental and control groups in order to determine if any differences occurring could be accounted for by a pre test advantage held by one group or the other. The .05 level was used as the criterion of statistical significance.

An item analysis was used to examine such variables as sex, age, and verbalizations within the experimental group.

CHAPTER IV

FINDINGS

An analysis of variance was used to determine the following:

1. If there was any significant difference in the pre test scores of the control group as compared to the experimental group.
2. If there was any significant difference in the post test scores of the control group as compared to the experimental group.

A covariance analysis was used to determine if any significant differences existed in the scores of the two groups that could be accounted for on the basis of differences in pre test scores of the two groups. The .05 level was used as the criterion of statistical significance.

The results of both the analysis of variance and the covariance analysis were statistically significant. The hypothesis that no significant differences would occur between the test scores of the control and experimental groups was therefore rejected.

Analysis of Variance, Pre Test

The analysis of variance of the pre test scores of the two groups demonstrated significance at the .05 level.

The analysis of variance demonstrated a significant difference in the pre test scores attained by the control and experimental groups. Utilizing the test value of $F = 4.14$, the value obtained at the .05 level, where $F = 4.535$,

Table 1. Analysis of variance, pre test

Source of variation	Degrees of freedom	Mean squares	F test value
Total	35	6.944	4.535*
Pre test	1	1.531	
	Pre test means		
Control	5.944		
Experimental	6.222		

*Significant at .05 level

is of minimal statistical significance. Results of the analysis of variance of the pre test scores demonstrated a higher test mean was attained by the experimental group as compared to the test mean of the control group.

Analysis of Variance, Post Test

The analysis of variance of the post test scores of the two groups demonstrated significance at the .05 level.

The analysis of variance demonstrated a significant difference in the post test scores attained by the experimental group and the control group. Where the test value of F = 4.14, the F value of 5.025 is a slightly larger value than the F value obtained in comparing the pre test scores of the two groups. However, in looking at the higher mean of the scores attained by the

Table 2. Analysis of variance, post test

Source of variation	Degrees of freedom	Mean squares	F test value
Total	35	7.111	5.025*
Post test	1	1.415	
		Post test means	
Control		6.833	
Experimental		7.722	

*Significant at .05 level

experimental group on the pre test measurement, it was decided to make an analysis of covariance to adjust for this difference in order to more accurately assess the findings.

Analysis of Covariance

Table 3. Covariance analysis

Source of variation	Degrees of freedom	Mean squares	Adjusted F test value
Post test	1	5.969	4.387*
Regression of pre and post test	1	3.218	
Error	33	1.360	
		Adjusted means	
Control		6.867	
Experimental		7.876	

*Significant at the .05 level

The covariance analysis demonstrated a significant difference in the scores of the control group as compared to the scores of the experimental group. However, this difference is much smaller with the variation in pre test scores taken into consideration. Where the test value of F must be greater than 4.14 to be significant at the .05 level, the obtained value of F = 4.38, adjusted for the mean differences is a rather small numerical difference.

Variables within the Experimental Group

Variables within the experimental group were examined to determine the effects of such factors as verbal participation in the experimental group, sex, and age. The main focus of the instructional program, comprising the experimental treatment, was on verbal participation. During the treatment period, the writer observed that the children could be classified in one of three ways. One group was highly verbal, participating in the instructional program with a high level of verbal output. The second group participated verbally part of the time and sat silently part of the time. The third group of children rarely participated with verbal responses, sitting silently the majority of the time. The writer became interested in determining if there were any differences among the three groups. In looking at the percentage of increase from the pre to the post test scores of the three groups, the following results were noted. The highest percentage of increase occurred among the group judged by the writer to be the most non-verbal. Although the group size was small, the percentage of increase of post test scores as compared to pre test scores

among this group was 40%. The groups judged moderately verbal and highly verbal showed the same percentage of increase in their post test scores, 14%.

In examining the variable of sex within the experimental group, it was found that the girls showed the largest percentage of increase. Among the eleven girls, the increase over the pre test scores was 31%, while among the seven boys, the increase was only .01%.

In looking at the combined variable of sex and verbalization within the group, the largest number of girls was in the low verbalization group. There were six girls and one boy in the low verbalization group; four boys and three girls in the high verbalization group; and two boys and two girls in the moderate verbalization group. (See Table 4.)

Table 4. Sex and verbalization. N = 18

Low verbalization	High verbalization	Moderate verbalization
Boys = 1	Boys = 4	Boys = 2
Girls = 6	Girls = 3	Girls = 2

For the purposes of examining the variable of age within the experimental group, the children were divided into two groups, those under the age of four years six months and those four years six months or older. The children under the age of four years six months showed the greatest

percentage increase in post test scores at 35%. The group in the older age range showed an increase of 22%.

Table 5. Experimental group variables. N = 18

Source of variation	Pre test totals	Post test totals	% of increase
Low verbal N = 7	43	55	40
Moderately verbal N = 4	25	29	14
High verbal N = 7	36	42	14
Sex			
Boys N = 7	54	55	.01
Girls N = 11	60	85	31
Age			
Under 4-6 N = 10	52	80	35
4-6 or over N = 8	53	68	22

CHAPTER V

DISCUSSION AND CONCLUSIONS

Scope of the Study

The main purpose of the study was to see if a highly structured verbal instructional program had a significant effect on the scores attained by the experimental group on a standardized test as compared to the control group. A statistical analysis showed that there was a difference in the post test scores of the two groups. However, while this difference was statistically significant, it is a small numerical difference. This small numerical difference suggests caution in interpreting the findings of this study. The primary emphasis of the experimental treatment was on verbal learning. In examining variables within the experimental group it was found that the children who were the least verbal made the highest percentage increase in the post test scores. These findings, although based on a small sample size, suggest that some factor or factors other than the instructional program may be responsible for the differences in post test score attainment of the two groups.

One possible factor may have been the influence of the instructional program per se. This phenomenon is often referred to as the Hawthorne effect. The Hawthorne effect, which was given that label because it was first recognized in a study made at the Hawthorne, Illinois plant of the Western Electric Company, is the tendency of subjects in some experiments to respond

to almost any kind of change, apparently due to a feeling of appreciation that someone is paying attention to them (Roethlisberger and Dickson, 1934). In that experiment, it was found that factory production went up when work conditions improved. However, when conditions were deliberately made worse, production went up even higher, apparently just because of the change. If this phenomenon also applies to teaching situations, a technique of teaching may thus bring about changes simply because it is different. It may well be that such a phenomenon had an effect within this study.

Another factor that must be taken into account is that the children in both the experimental and control groups were also concurrently enrolled in a highly enriched pre-school program. The Child Development Laboratory program at Utah State University Laboratory school is designed to encourage learning on all levels, including the verbal level. It may be that the multisensory learnings stimulated by the Laboratory school environment served as a strong reinforcement for those concepts being taught at the verbal level within the instructional program that comprised the experimental treatment. In the course of participating in the Laboratory school program, children in the experimental group had many opportunities to manipulate objects, listen to stories, to be exposed to language modeling through interaction with teachers and other children, and were thus provided with reinforcement of concepts taught on the verbal level. The Laboratory school experience may have served to concretely reinforce concepts being taught within the

instructional program. Therefore, it may be that the benefits of the program are limited, in this study, to the tutorial method, used as a supplement.

Another aspect of the Laboratory experience that may have affected the experimental group is the curriculum. Control group children were enrolled in the morning classrooms and experimental group children were enrolled in the afternoon classrooms. While there is a common educational approach and philosophy in all four classrooms, there is considerable variation among the classrooms in terms of actual curriculum content. Practice teachers in each Laboratory classroom plan teaching units under the supervision of the head teacher and the Laboratory supervisor. The content of these teaching units is highly variable. It is therefore, entirely possible that children in the afternoon classrooms were exposed to teaching units that were quite different in content as compared to the morning classrooms, or control group children. These differences in content may have been more reinforcing to the concepts being examined within the scope of this study.

The Experimental Treatment

The experimental treatment consisted of a highly structured instructional program, administered to the experimental group, in a series of twelve sessions. These sessions consisted of verbal instructions from the writer and verbal responses from the children. The children were in small groups of five or six, for the purposes of the instructional sessions.

A high level of extrinsic reinforcement in the form of verbal praise from the writer, smiles, nods, pats on the back, etc. was required to sustain the children's interest in the program. During the instructional sessions, the children were not permitted to move about. They were required to remain seated, attending to the visual aids, and the writer. It was quite a challenge to keep subjects of the age of the experimental group children seated. The tendency of the subjects was to stand up and to move around. However, movement was very distracting, and the subjects would stop attending to their task. As noted earlier in this study, the experimental group children, became quite bored and restless with the instructional program by the mid-point in the study.

The instructional program was very repetitious in content as the same language labels were used again and again. Just before the mid-point of the study, the more verbal children began to give nonsense phrases as responses.

Related Findings

In examining the combined variables of sex and verbalization, it was found that, in this study, the boys were more verbal than the girls within the experimental group. This finding is somewhat inconsistent with the findings of other researchers, although the literature does indicate disagreement among various studies. Five sources indicated girls exceeded boys in verbalization (McCarthy, 1930; Olson and Koetzle, 1936; Jersild and Ritzman, 1938; Young, 1941; Entwisle, 1969). Two reported no sex differences in verbalizations

(Goodenough, 1930; Smith, 1970). One study (O'Donnel, 1967) reported that boys exceeded girls in verbalization.

One possible explanation for the differences reported by this writer may be the experimental situation itself. The instructional program was highly spirited and may have fostered a feeling of competitiveness that favored the boys. It may be that the boys were reflecting a speculated cultural tendency that allows males to behave in more aggressive ways than females. It is beyond the scope of this study to pursue this contention further than suggesting this as a possible explanation for the verbal reticence of the girl subjects within the experimental group.

The girls were in the majority, in low verbalization, within the experimental group, and they were in the group demonstrating the highest percentage increase. So while they did not participate verbally in the instructional program, they showed larger gains in their post test scores. The Laboratory experience may have had an effect in this instance. Within the Laboratory school experience, verbalization is equally encouraged among both boys and girls. The laboratory experience may have had the effect of providing multi-sensory reinforcement of the concepts being taught within the instructional program. It is the writer's contention that research evidence demonstrates a fair amount of disagreement as to the verbal ability of boys as compared to girls. It may be that the popular assumption that girls have verbal abilities which are superior to that of boys will not be validated by further research in this area.

Age was a variable examined within the experimental group. The average age of subjects within the study sample was four years, six months. Findings of this study, although based on a small sample size of eighteen subjects, indicate that the children under the age of four years six months showed the highest percentage increase in post test scores. These findings suggest that the children in the lower age range had not yet attained the skill level of the children in the higher age and therefore could profit more by the instructional program. The presence of older subjects within each experimental group may have also had a bearing on the achievement of the younger subjects. It may be that the older subjects served as language models for the younger subjects.

These findings further suggest that the younger age range represents a more sensitive period in language development and therefore this type of language learning experience is of more utility in working with younger children.

Summary

The objective of this study was to determine if a highly structured instructional program would make any significant difference in the scores attained on a standardized test by the group receiving the instruction (experimental group) as compared to the control group that did not receive instruction. A pre and post test was administered to both groups. The language labels for

positional prepositions comprised the content of the instructional programs. These included: next to, inside, behind, by the side of, below and above.

The following hypothesis served as a guide for this study:

> There will be no significant difference in the scores attained by the experimental group on a standardized test as compared to the control group. The results of the study indicated that a statistically significant difference did exist, thus the hypothesis of no difference was rejected.

General Conclusions

There is always an inherent difficulty in the attempt to quantify and to measure those things in the human realm, such as the learning of young children.

The test instrument used in this study measured the ability of the child to use and identify language labels as a way of measuring his concept attainment. It is the writer's contention, that this test instrument may be a more accurate measure of language labeling ability than of concept attainment. The writer further contends that it is unwise to assume that because a child can produce the language label, he has learned the underlying concept as well. The child has merely demonstrated his learning on the verbal level.

Based upon the findings of this present study, the writer urges caution in advocating the use of a highly structured verbal program as an educational technique with young, advantaged, middle-class children. It is the conclusion

of the writer that the statistical significance of the differences between the control and experimental groups was too small to demonstrate any clearcut superiority of the highly structured instructional program as compared to the more traditional pre-school program.

It is the writer's contention that further investigation in the broad area of teaching methods is needed. Also, one must refer back to the theoretical framework proved by educational psychologists in determining a philosophical base for curriculum. It then becomes necessary to deal directly with pre-school program goals and objectives. If the objectives of a particular program encompass more than the development of the child's cognitive skills, then the educational approach may be quite different as compared to the type of program where acceleration of learning is the primary goal.

The literature cited in this study indicates a considerable amount of debate and disagreement in the field of early childhood education as to what does constitute the correct approach in the designing of programs for the very young. There is no clearly defined path for teachers to follow. The decision of what approach to use in curriculum design is still left largely to the teacher, and is based primarily, on the teacher's personal philosophy of education. Until such time as the research literature presents teachers with a clearly defined mandate, curriculum design will continue to be a creative, intellectual, and philosophical responsibility of the classroom teacher. This responsibility remains, as it has in the past, as the gravest and yet the most exciting challenge in the art of teaching.

Conclusions

Based on the findings of this study, a formalized instructional program appears to have a marginal but beneficial impact on the acquisition of language labels when used as a tutorial supplement to an enriched pre-school learning program, in mutually reinforcing ways.

Suggestions for further study

There are several other possibilities for further investigation in this area of teaching methods, suggested by this study.

1. A larger sample could be used in a study similar to the present one to determine if the same results would be found when various sample sizes are used.
2. A comparison could be made between subjects of varying socio-economic status in order to determine the role played by background of the study subjects.
3. Since there is a possibility that the Child Development Laboratory experience was a factor in the results of the present study, a similar study comparing those children who have not been enrolled in the Laboratory school would offer some insight as to the effects that enrollment in this program had on the results of the study.
4. A similar study could be carried out employing a study sample from varying ethnic and cultural backgrounds in

order to determine the role played by these variables.

5. Further investigation into the area of language development may help to clarify the role played by sex, if any, in the development of verbal ability.
6. A similar study to the present one could be carried out to determine the effects of grouping older children and younger children together in a learning situation.
7. A similar study could be carried out utilizing a male examiner as this study was done by a female.

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APPENDIXES

Appendix A

Instructional Program

Prepositional concepts

Instructional Procedure

LEVEL I

Objective: Introduction of positional preposition language labels--next to, inside, behind, by the side of, below and above.

1. Place the table cut-out on the flannel board.
   Objective: Identification of visual aids.

2. Examiner: This is a table. Say the whole thing.

   Children: This is a table.

   Examiner: Good! You're very smart today.

3. Repeat process with cut-out of the ball and the box.

4. Examiner: This is a ball. Say the whole thing.

   Children: This is a ball. (correct response)

   Examiner: Good. I like the way you remembered to say the whole thing. We're going to play a game with this table, ball and box.

5. Examiner places the ball on top of the table.

   Examiner: Where is the ball?

   Children: On top of the table.

   Examiner: Say the whole thing. Like this. The ball is on top of the table.

   Children: The ball is on top of the table. (correct response)

Examiner: That's the way. You're remembering how to say the whole thing.

6. Examiner: Where is the ball?

   Children: The ball is on top of the table.

   Examiner: Good. Where is the ball? Say it fast.

   Children: The ball is on top of the table. (spoken more quickly)

7. Examiner: Where is the ball? Say it loudly.

   Children: The ball is on top of the table. (response in loud voice)

8. The same basic format is repeated using the other language labels. A high level of verbal reinforcement is used in order to strengthen correct responses. A rapid-fire delivery is used by the examiner in order to sustain the interest of the children. The devices of "saying it fast" and "saying it loudly" also serve to sustain interest.

LEVEL II

Objective: Introduction of the "not" and "fooler" games as a means to review and reinforce concepts taught in Level I.

1. The "not" game.

   Examiner: Is the ball on top of the table?

   Children: No.

   Examiner: Say the whole thing. Say it like this. The ball is not on top of the table, the ball is below the table. Is the ball on top of the table?

   Children: No. The ball is not on top of the table. The ball is below the table.

   Examiner: Very good.

2. The "fooler" game.

Examiner: I'm going to try to fool you, so pay very close attention. Ready? All eyes here. (indicates the board; places ball by the side of the table)

The ball is on top of the table. Did I say that right?

Children: Yes.

Examiner: No. I did not do that right. The ball is not on top of the table. The ball is by the side of the table. Let's try that again. (procedure is repeated until children can correct the examiner's error)

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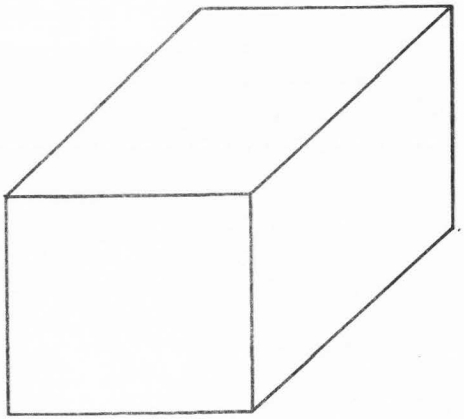
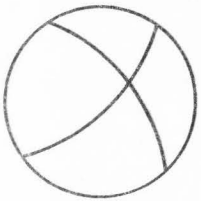
Visual aids

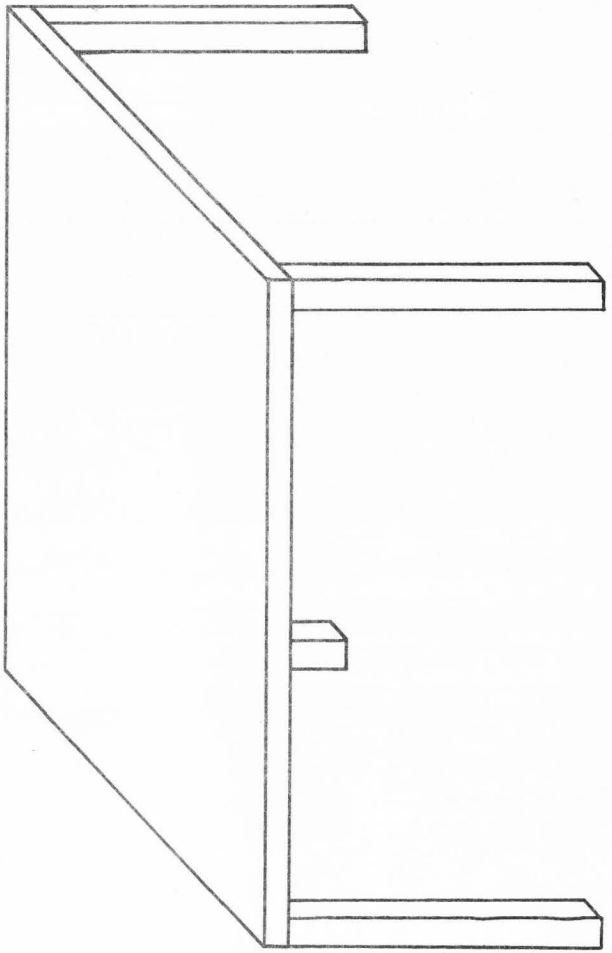
Box



Ball

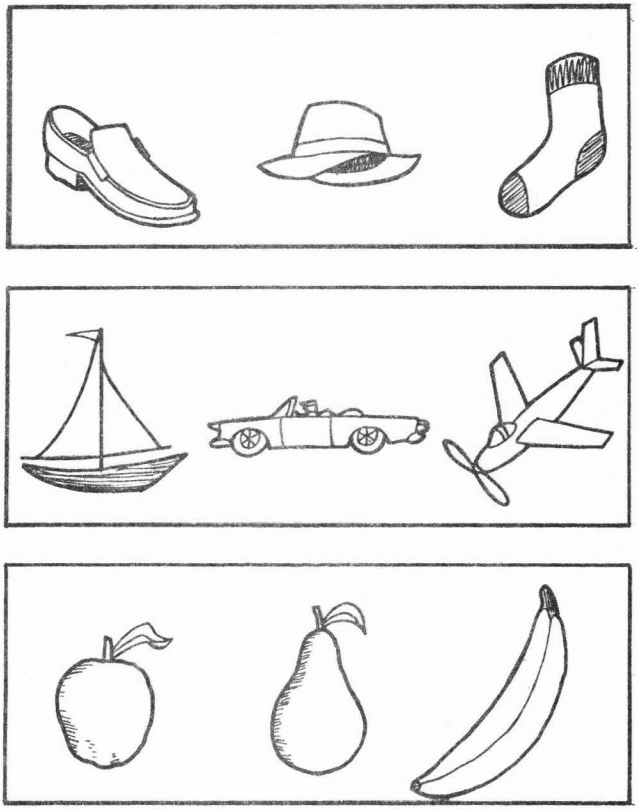


Table

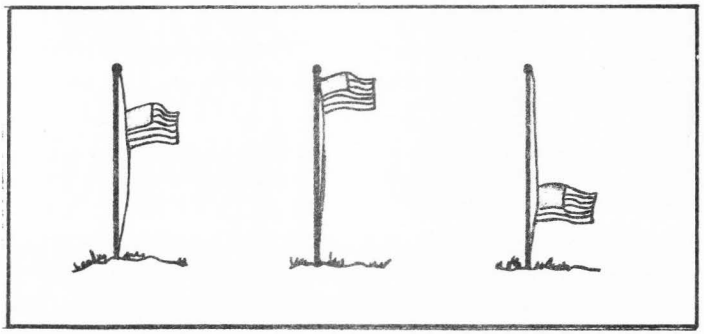


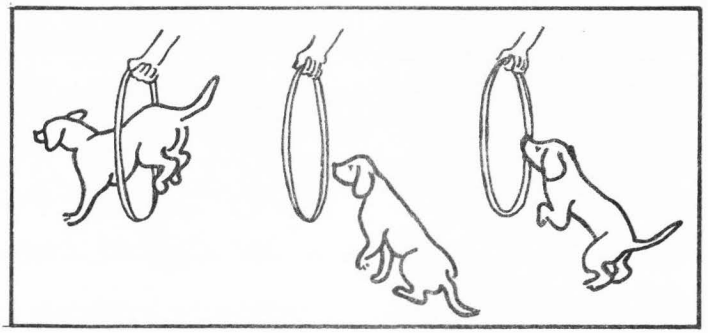
Appendix B

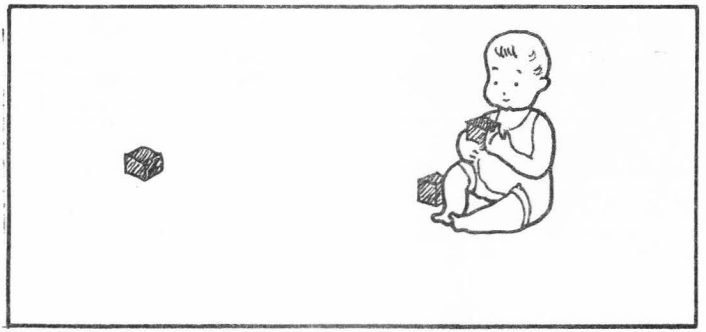
Test Instrument

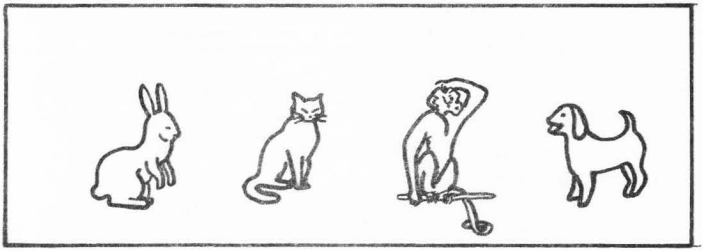


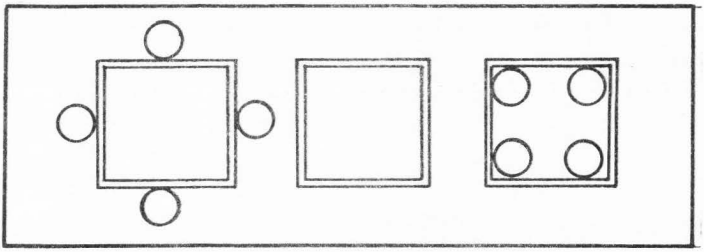
Form B, Booklet 1. Taken from Ann E. Boehm. Boehm Test of Basic Concepts. 1967, 1970. The Psychological Corporation, 304 East 45th Street, New York, N.Y. 10017. Form 71-185T.

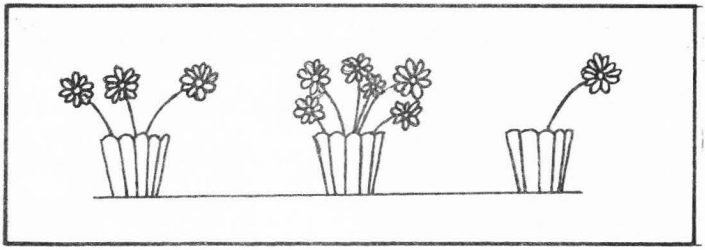


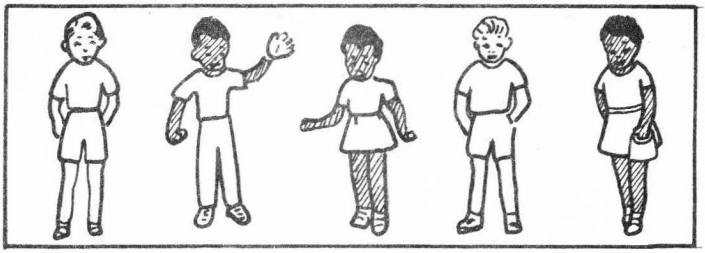


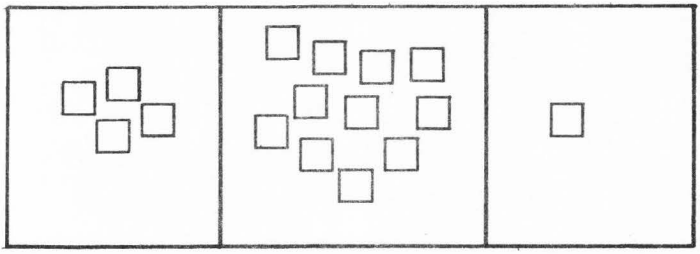


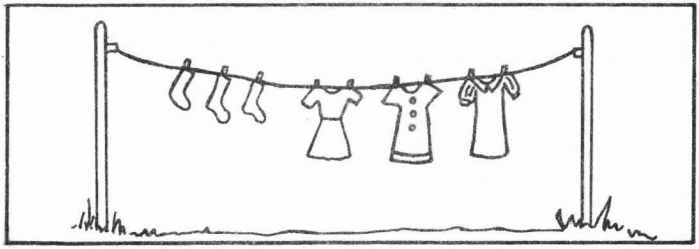


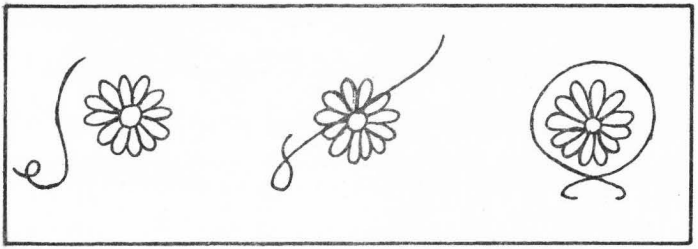


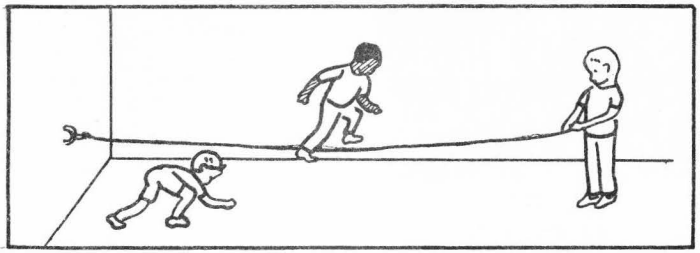


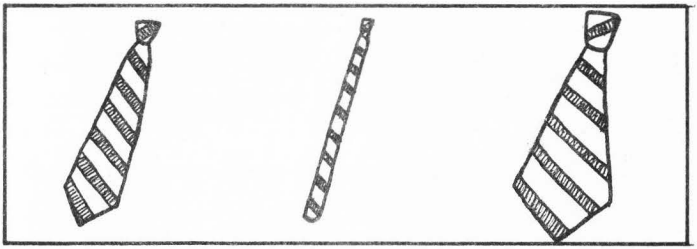


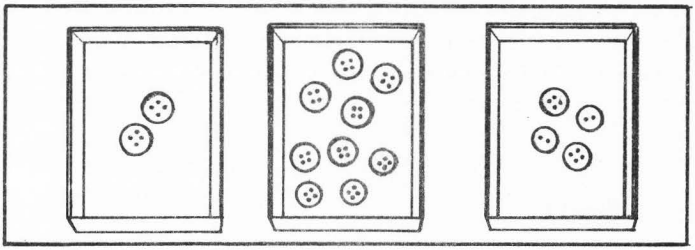


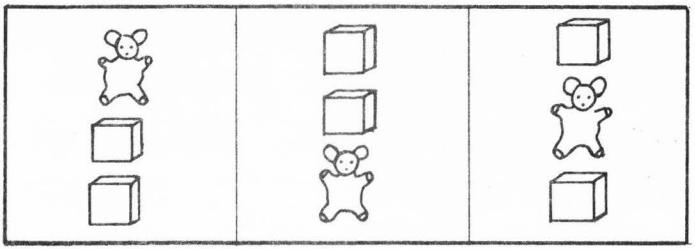


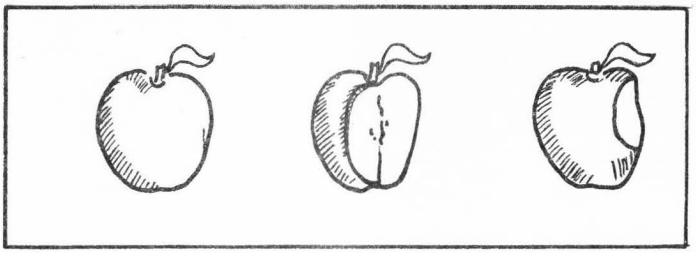


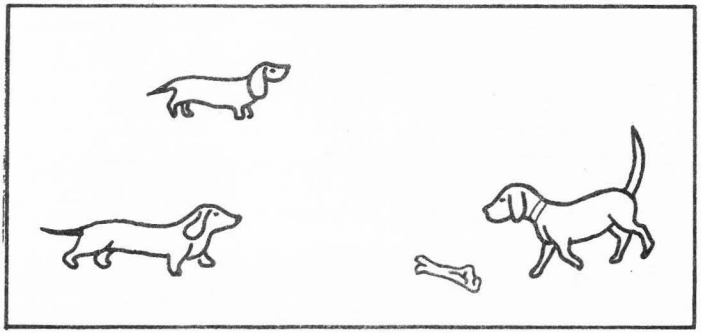


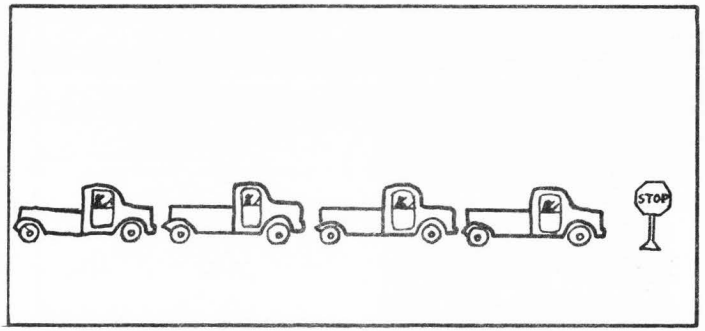








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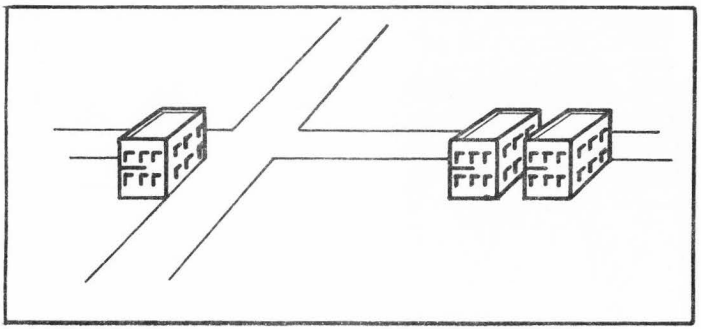
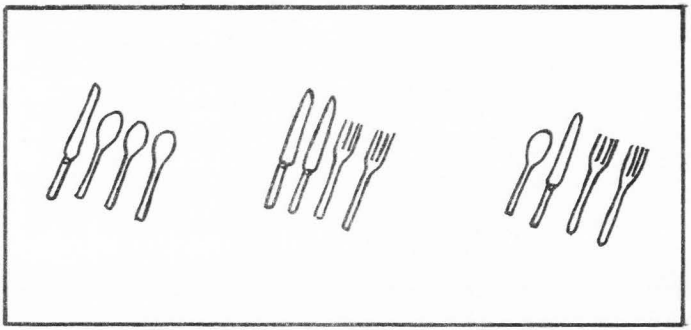
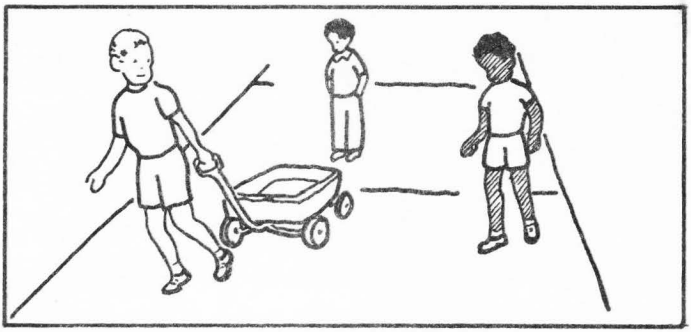
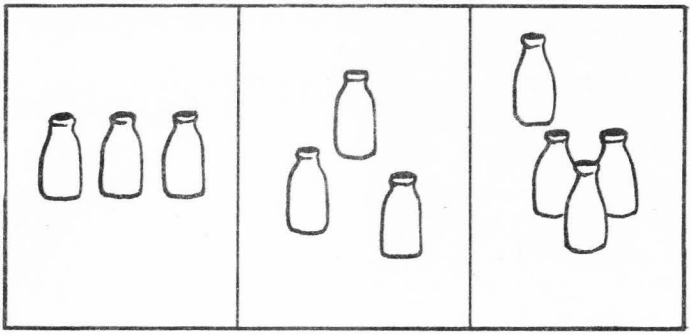
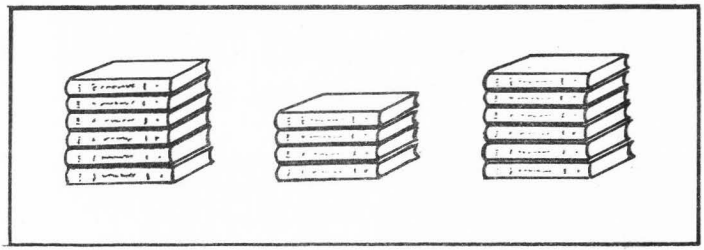
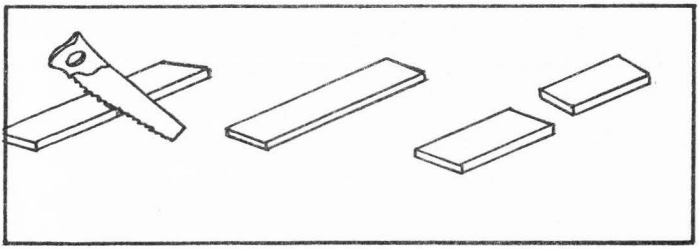


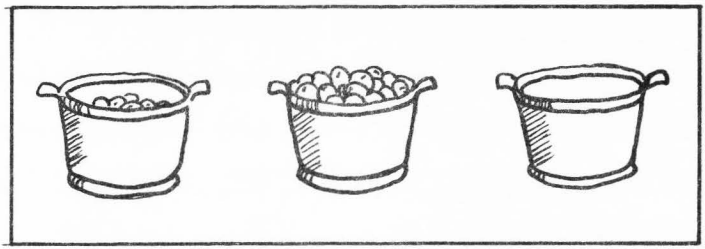


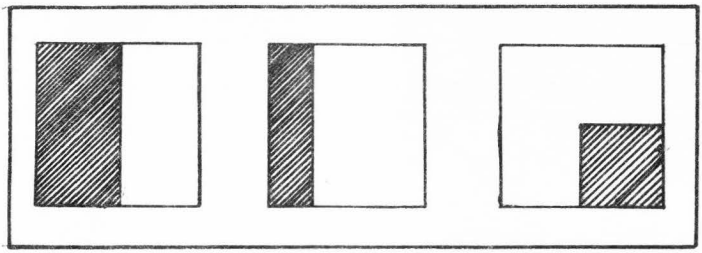


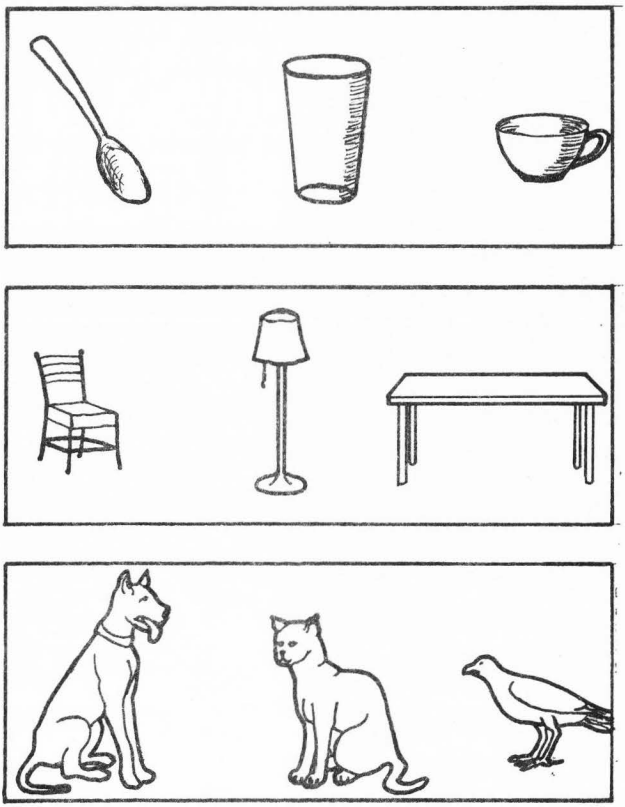




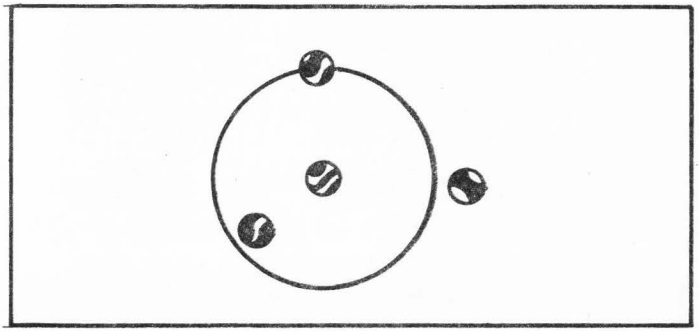


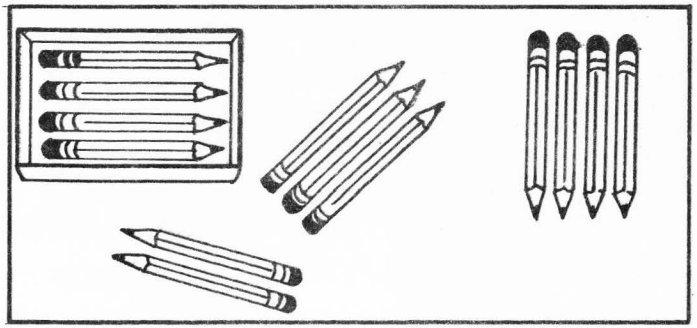


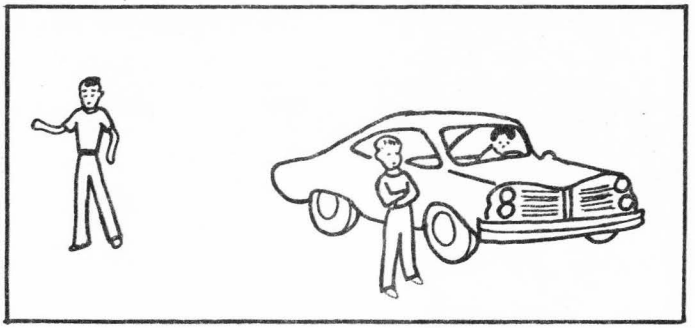


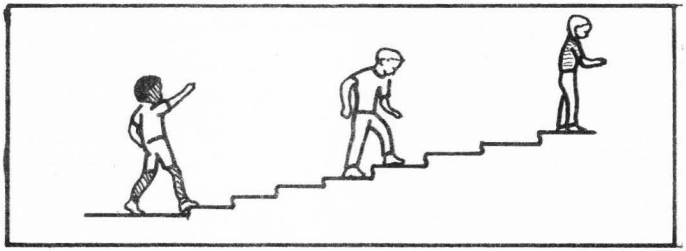


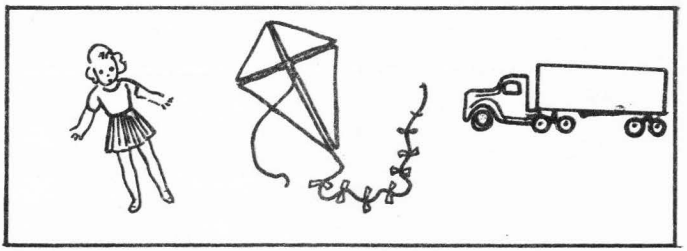
Form B, Booklet 2. Taken from Ann E. Boehm. Boehm Test of Basic Concepts. 1967, 1970. The Psychological Corporation, 304 East 45th Street, New York, N.Y. 10017. Form 71-186T.

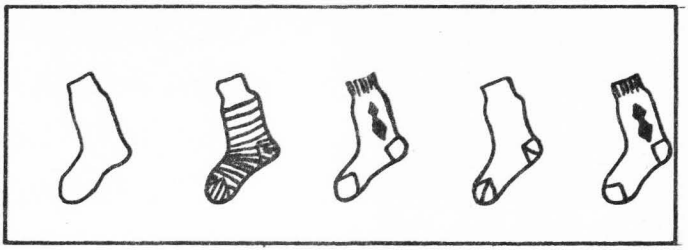


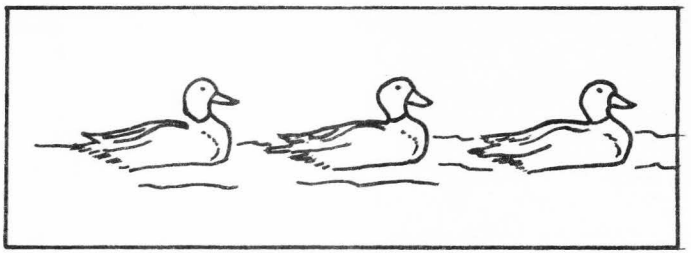


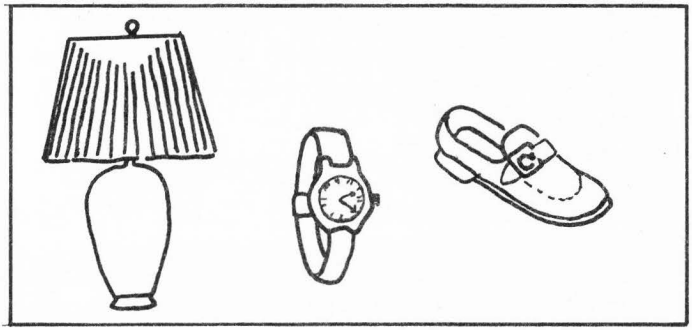


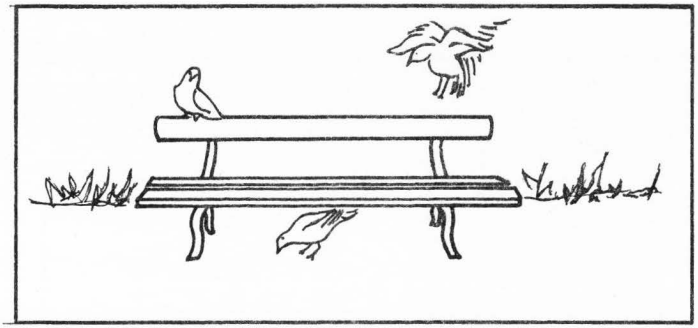


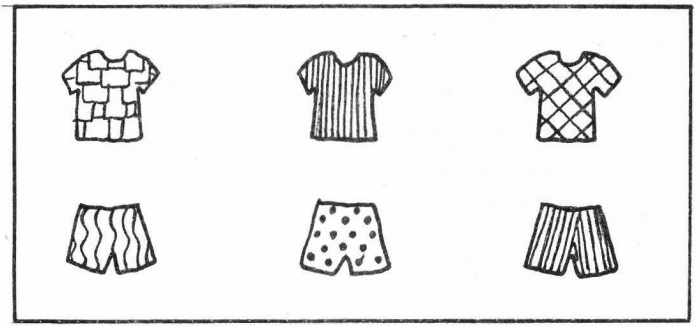


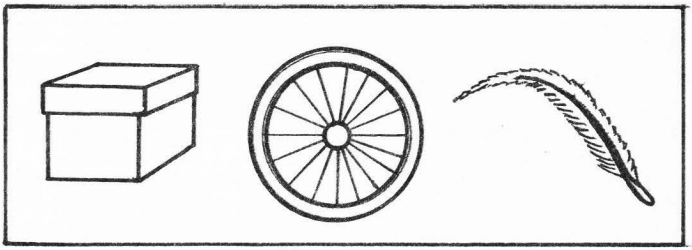


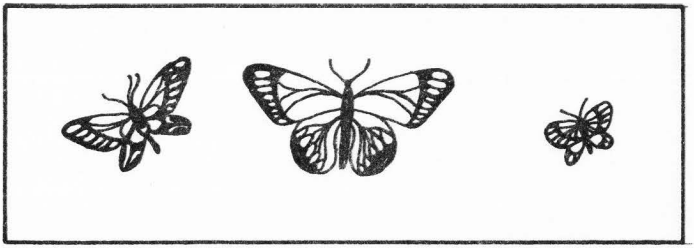


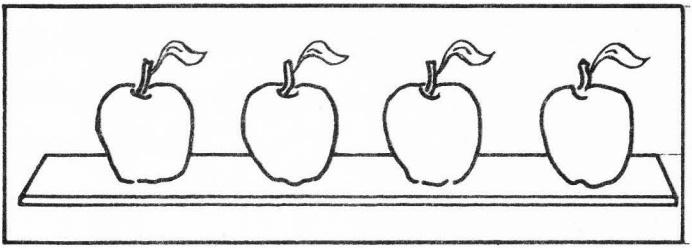


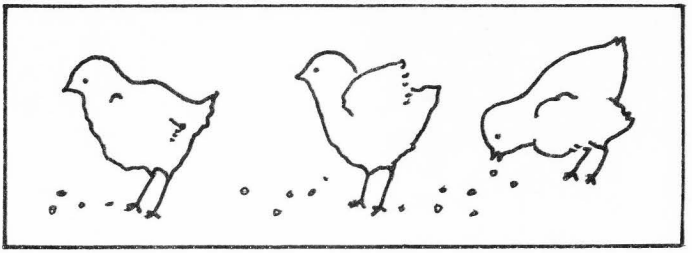


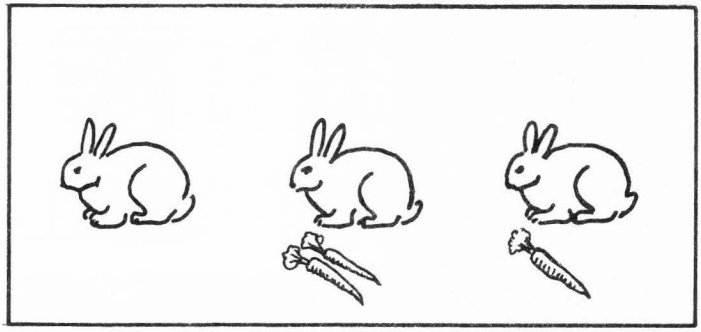


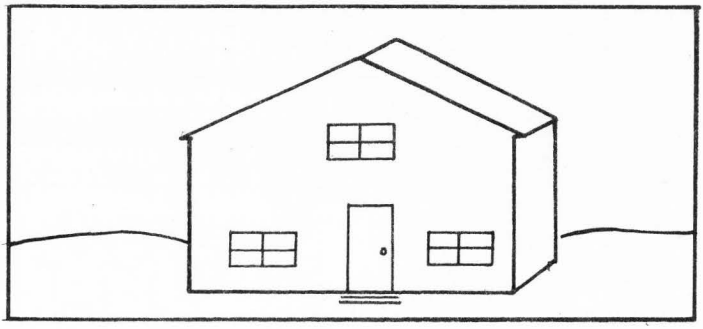


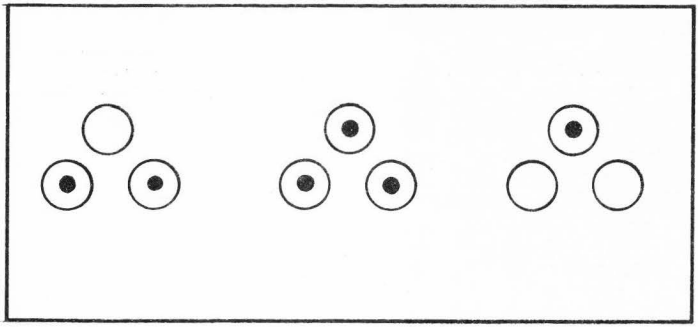


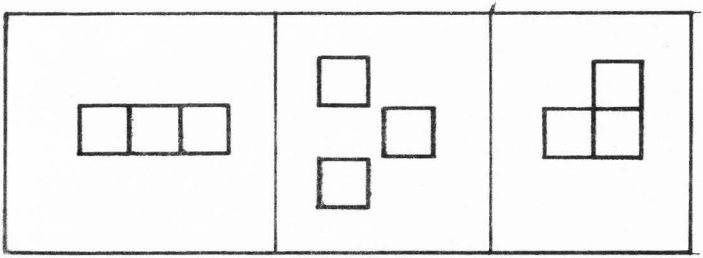


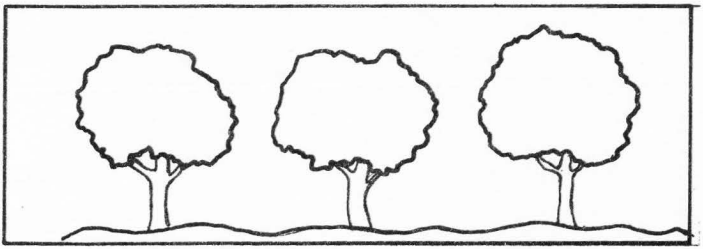


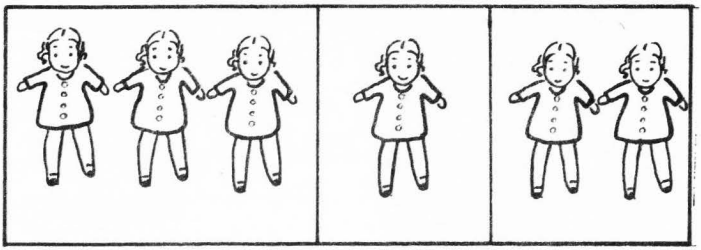


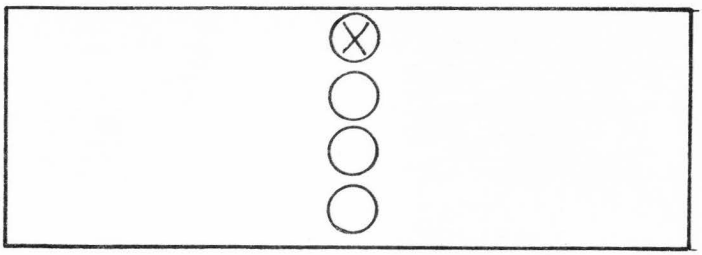


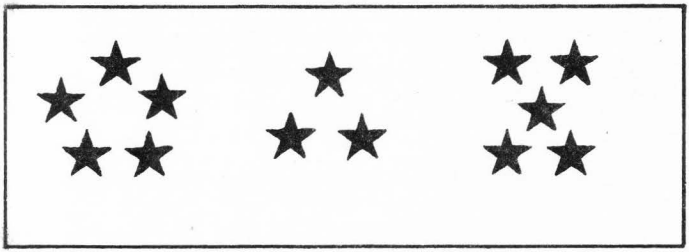


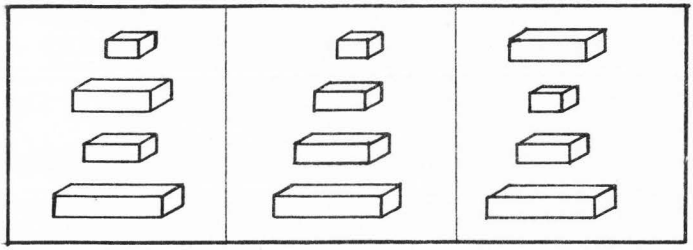


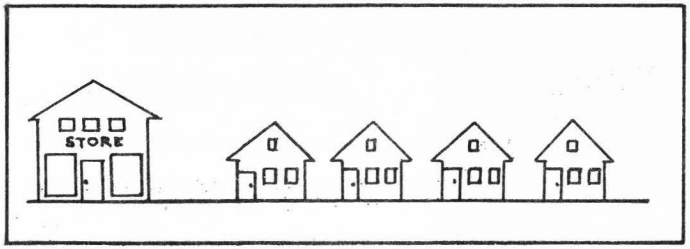








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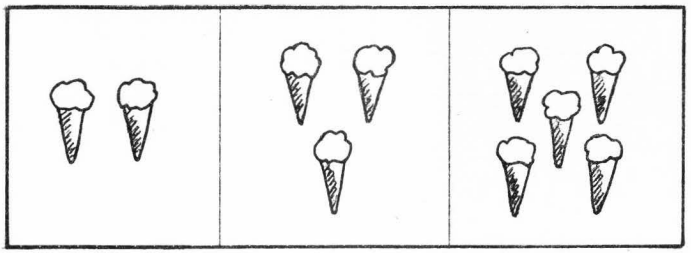

VITA

Joan Spencer Ross

Candidate for the Degree of

Master of Science

Thesis: Effects of an Instructional Program on Concept Attainment of Middle-Class Pre-Kindergarten Children

Major Field: Child Development

Biographical Information:

Personal Data: Born at Salt Lake City, Utah, January 25, 1940, daughter of John F. and Lucy Pignataro; married William Ronald Ross December, 1970; two children.

Education: Attended elementary and secondary schools in Salt Lake City, Utah; graduated from South High School in 1959; received Associate of Arts degree from El Camino College, Redondo Beach, California, in 1961; received a Bachelor of Science degree from Utah State University, Logan, Utah, in 1972, with a major in Child Development; began graduate work at the same university; completed requirements for Master of Science degree at Utah State University in 1973.

Professional Experience: 1972-73, graduate assistant, head teacher, Utah State University Child Development Laboratory School; 1968-1970, senior teacher, La Playa Co-operative Nursery School, Culver City, California.