

AN INVESTIGATION OF TRANSFER AND ATTITUDE IN PRESCHOOL  
CHILDREN AS A FUNCTION OF INSTRUCTIONAL  
MODE AND DEVELOPMENTAL STAGE

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A Dissertation  
Presented to  
the Faculty of the College of Education  
University of Houston

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In Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Education

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by  
Doyle Glen Walls  
August, 1973

## ACKNOWLEDGEMENTS

The writer wishes to express his sincere appreciation to the many people whose contributions have made this study possible.

Special appreciation is expressed to Dr. Joseph Carbonari, chairman of the research committee, for his encouragement, support, wisdom, and his patience in seeing this study through to its conclusion.

Grateful appreciation is expressed to Dr. Robert Williams, Dr. Andrew Jackson, and Dr. James Tinsley, members of the research committee, for their time, guidance, and support which made the completion of this dissertation possible.

Acknowledgement is also due to Mrs. Hermann and Mrs. Gilbert, directors of the Jewish Community Center Nursery School, and the children who participated so willingly in this study.

A debt of gratitude is due to Mrs. Pam Bundrock who typed the dissertation.

Finally most special appreciation and lifelong thanks is due to my wife, Sharon, who assisted in the collection of all data, and provided constant encouragement and support throughout the doctoral program.

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## ABSTRACT

Walls, Doyle Glen. "An investigation of transfer and attitude in preschool children as a function of instructional mode and developmental stage." Unpublished doctoral dissertation, University of Houston, 1973.

The primary purpose of this research was to determine if transfer and attitude in preschool children was a function of instructional mode and developmental stage. Literature relating to previous developmental research on conditioning, experiential methods, attitudes, and transfer were reviewed and discussed.

Evidence found in the study supported the conclusion that attitude in preschool children was a function of instructional mode. Children who were permitted choice and manipulation of objects exhibited a more positive attitude than children who were not. Children in a higher developmental stage displayed better transfer scores than children in a lower developmental stage. A significant relationship was found between transfer and attitude.

It was concluded that this study could represent the beginning of a new direction in research on attitude toward instructional modes and its effect on learning. Possibilities for further research were presented using the findings of this study as the impetus for such research.

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AN INVESTIGATION OF TRANSFER AND ATTITUDE IN PRESCHOOL  
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Elkind (1970a) stated that the past few years have witnessed a remarkable growth of professional interest in young children and the preschool education they receive. In part, this new interest in young children comes from research studies (reviewed by Scott, 1968; Stevenson, Hess, & Rheingold, 1967) which suggest that the preschool years are of great importance not only for intellectual, but also for social and emotional, growth. While these findings might not have come as a surprise to nursery school teachers, they have come as something of a revelation to many educators and psychologists who previously stated that the preschool years were important primarily for intellectual growth (Bruner, 1960; Fowler, 1962a; Hunt, 1961).

At least two consequences of this new recognition of the importance of the preschool years for mental growth were stated by Elkind (1970a). One of these is a movement in California, Massachusetts, and New York, to provide preschool education for all children whose parents desire it. The second consequence of this new focus upon the



preschool child is a growing sentiment towards changing the character of preschool education.

It appears evident that ever increasing numbers of three and four year old children will be enrolled in some type of preschool program. Research is needed not only to find the kinds of programs that will lead to effective development of intellectual skills, but to assess the effects of preschool programs on the affective development of the child. Unless a preschool program generates positive attitudes toward school, it probably should be used very cautiously or not introduced at all.

Some studies indicate that preschools should pay more attention to children's cognitive and intellectual development than adjustment, child guidance and play (Bereiter & Englemann, 1966; Deutsch, 1964; Fowler, 1962, a&b, 1965; Roeper, 1959). A question of what methods should be used to bring about the desired cognitive and intellectual development should be considered rather than whether to pay more attention to cognitive and intellectual development than adjustment, child guidance, or play.

#### Statement of the Problem

Are there differences in transfer and attitude of the preschool child as a function of instructional mode and developmental stage?

## Review of Literature

The literature review for the present study will be divided into four major areas. The review pertinent to each major area will be given and at the end of the review a summary of each area will be presented.

Four questions were posed as guidelines for the literature review concerning the learning of the child and its implications for preschool programs. The four questions will be listed initially so that an overall direction can be established.

1. Can young children be conditioned to make discriminations and learn concepts?

2. Can young children learn concepts and develop intellectual skills through experience, manipulation and exploration of the environment?

3. What kind of attitude toward the instructional mode is formed in young children, and does this attitude affect present or future learning?

4. Will preschool children in various stages of development react in similar or unlike ways toward different instructional modes?

The first major area concerns discrimination, concept learning, and conditioning. Can young children be conditioned to make discriminations and learn concepts?

Many perceptual abilities such as those involving discrimination of light, sound, color, form, depth and size constancy are reported to be well established by three or four years of age. Brian & Goodenough (1929) tested 219 children 12-60 months of age. The children were required to match a colored geometric form with one of two other forms, one of which was the same color but a different form, and the other of which was the same form but a different color. Colors used were primary and saturated; forms were such clearly differentiated ones as a square, circle, or triangle. The younger group's (12-30 months of age) response indicated that under 30 months of age, children's matching choices were largely based on form similarity. Children older than 30 months of age showed a steady increase in matching choices based on color, with a peak at 54 months. After this period there was a decline in color matching and an increase in form matching. At the adult level, 90% of the matching choices were based on form. This suggests a developmental sequence in perception of objects with form or color characteristics dominant at different periods.

Suchman & Trabasso (1966) studied preferences for color, form and size stimuli by nursery and kindergarten children 36-72 months of age. They found younger children

preferred color and older children preferred form with the median transition age at 50 months.

Staples (1932) found that infants three months old spent twice as long looking at the colored disc as at the gray one. Children from 3-24 months of age showed a marked preference for red. Beyond 24 months of age, there was a decreasing group preference for any particular color.

Huang (1945) was able to show that the relative intensity of color and form stimuli affected responses. In a test situation 30 children ages 36-72 months matched on the basis of color 87½% of the time when marked color differences (complementary colors) were paired with slight form differences (square and rectangle, or circle and ellipse). Conversely they matched on the basis of form 93.1% of the time when large form differences (circle and irregular shape) were paired with slight color differences (red and pink, or two saturations of yellow). In further elaborations of this situation, it was found that when children were given a series of matching tests in which the form of the objects remained the same but differences in color progressively increased, color matching choices increased.

Cook (1931) found that children apparently discriminate colors better when they can name them. In a test of color matching and color naming, 210 children 17-72

months of age were asked to name and match Munsell color hues in three different light and saturation values. At 24 months of age children matched correctly 45% of the time and named correctly 25% of the time. At 72 months children matched with 97% accuracy and named with 62% accuracy. A correlation of .90 between color naming and color matching suggests the part that naming plays in color differentiation.

Welch (1939a) studied discrimination of form and area in infants 18-28 months of age. Findings indicated the infants that received more hours of conditioning were able to make more accurate discriminations of form and area than the infants who received fewer hours of conditioning.

Fowler (1962a) stated that the majority of studies of perceptual-cognitive functioning in the preschool child did not attempt to ascertain more than the status of abilities at a given age level. The focus was on simple discrimination or perceptual problems that embraced no more than two elementary concepts.

Several investigations have shown that children less than three years of age can learn concepts based on the use of tools for solving a problem. Richardson (1932) found that infants 18-36 months of age could be taught to use a lever to move an object that kept them from reaching a toy. More repetitions were needed with the 18 month old

infants than the 36 month old children. In another study Richardson (1934) found that infants 12-30 months of age could use tools to reach a piece of candy.

Welch (1939b) conducted an experiment to condition 20 month old children to associate objects with arbitrarily chosen names. A mean of over 500 repetitions was required to condition the children to associate a wooden plate with the word ate.

Jones (1931) was able to show evidence of higher order conditioning in children as young as 15 months of age. Higher order conditioning was defined as overt emotional responses.

These studies indicate that children can be conditioned to make discriminations and learn concepts when enough repetitions are provided. The educational implication is that the preschool could be a place to develop intellectual and cognitive skills through training and S-R conditioning methods.

In the studies surveyed, the researchers did not mention the children's emotional feelings during or after the conditioning. No mention was made concerning the children's motivation to continue nor their interest and attitude toward the conditioning procedure.

Welch (1940) reported that he encountered some motivational resistance when he endeavored to teach

genus-species relations to 12-20 month old children. He does not mention emotional difficulties as an important or recurrent problem in any of his experimental work with preschool children.

No indication was found in the literature surveyed that any attempt was made to measure or assess the attitudes of the children toward the conditioning procedures. The literature did support the conclusion that young children can be conditioned to solve simple tasks. With enough repetitions the young children were able to respond correctly. Young children at various ages were able to be conditioned to make discriminations. Other young children were conditioned to learn simple concepts. The literature contains sufficient evidence to indicate that young children between 12-72 months of age can be conditioned to perform various tasks.

Can young children learn concepts and develop intellectual skills through experience, manipulation, and exploration of the environment?

Read (1966) stated that first hand experience was necessary to the learning process. So often the child's concepts are hazy and indefinite, and when their whole being is involved with an actual first hand experience, it can clarify their thinking and become the basis for understanding and later learning.

Wadsworth (1971) stated that a factor in cognitive development is physical experience. The child must have experience with objects and stimuli in the environment in which he acts on objects. Assimilation and accommodation cannot take place unless there is interaction between the organism and the environment. Not only must the child have experience, but he must act on the environment, not just react to it as in S-R learning. The growth of cognitive structures (schemata) via assimilation and accommodation requires that the child interact with the environment.

Rand (1970) indicated that a good teacher must offer experiences to which young children can react. Without these experiences, the learning will not be as effective. As children express their own thoughts, feelings and learnings to these reactions, it is the adult's role to listen artfully.

Group cooking experiences had once been thought of as an acceptable learning tool in early childhood programs (Rudolph & Cohen, 1964). Of late, this theory of education has been criticized for not providing sufficient learnings that are deemed vital for children today. The experience approach to learning, as such, has been derided by some educators for not being specifically directed in math and language skills to meet the cognitive learning



needs of the children in the preschool programs. Rand (1970) stated that experience oriented situations in preschools such as group cooking, can provide opportunities for the child to develop skill in language arts, mathematics, science, and social development.

Elkind (1970b) stated that there is still much to be learned about optimal periods for acquiring knowledge and skill. It is wiser to avoid risking those which may discourage or handicap learning in later life. The child should be able to experiment and explore an environment full of challenging, concrete, natural experiences.

Torrance (1970) worked with six year old children in an attempt to measure the frequency and quality of the questions they asked. In this study, six year olds were presented with unfamiliar objects which they could touch, and some objects which they could not touch. The children showed a greater frequency and quality of question asking when they were allowed to manipulate the objects. The results indicated that significantly more questions were asked in the manipulative situation than the non-manipulative. Being able to handle objects, feel them, smell them and listen to them seemed to facilitate the warm up process necessary for creative thinking and the deepening of curiosity. The results of this experiment seem to support the previous findings concerning the facilitating effect

of manipulation of objects in evoking inventive responses on tests of creative thinking, and previous conclusions concerning the importance of manipulative tendencies in the psychology of invention. The natural way for young children to acquire information about objects in their environment is to manipulate them and ask questions about matters that they cannot figure out for themselves.

Landreth (1962) stated that concept formation was aided by providing the child with first hand experiences. These must be within the range of his understanding. The child's concept formation develops further by stimulating and channeling interest and curiosity, and fostering the child's ability to relate and compare.

Wheeler (1971) concluded that the environment needed within the school was one that would be responsive to the needs and interests of children, where their learning would be deeply rooted in experience. A good classroom should contain a rich supply of materials for children to explore with abundant opportunities for learning through experience.

The literature supports the assumption that young children can learn concepts and develop intellectual skills through experience, manipulation, and exploration of the environment. Evidence was found to indicate that manipulation of objects facilitated learning responses in novel

situations. Other evidence was cited that showed concept learning was aided by experiential techniques. These results indicate that experiential methods can be used to aid young children in the acquisition of concepts and the development of intellectual skills.

Evidence was found earlier in the review that supported the conclusion that young children could learn concepts and make discriminations through conditioning methods. Recent evidence indicated that young children could learn concepts and develop intellectual skills using experiential techniques. Therefore, since both methods produced the desired cognitive development, the next area to review concerns the child's attitudes about the methods used, and whether these attitudes affect learning.

What kind of attitude toward the instructional mode is formed in the learner, and does this attitude affect present or future learning?

Krathwohl (1964) stated that under some conditions, the development of cognitive behaviors (the activity of the mind in knowing an object) may actually destroy certain desired affective behaviors. Instead of a positive relationship between growth in cognitive and affective behavior, it is conceivable that there may be an inverse relationship in the two domains.

Brown (1971) stated that the denial of the development of affective behaviors may destroy or limit anticipated cognitive behaviors. He also stated that it is impossible to learn anything cognitively without there being some feeling response involved. The intensity of the feeling response is also related to how much the individual is personally involved in the cognitive learning.

These two studies and the apparent lack of any others indicate that research is needed in the area of attitude toward instructional mode and its effect on learning. If the preschool child is placed in an instructional mode that hinders the development of a positive attitude toward learning, will this lessen the amount of cognitive development? If the preschool child is placed in an instructional mode that develops a positive attitude toward learning, will this produce a greater amount of cognitive development?

Assessing attitudes in young children is difficult. Many factors directly affect the study of their attitudes and values. The young child has a narrow experience range. Often the very common content about which to study attitudes may not be a part of the child's experienced world or may have very idiosyncratic meaning for him. Although he may oblige a friendly investigator by responding about things that are largely unknown to him, it would be in error to ascribe attitudes to him.

The child has difficulty in handling verbal test situations. Part of this is due to his lack of experience in dealing with abstracts, and part due to his ties to concrete situations. Further difficulties derive from his inability to handle adequately part-whole relations, inclusiveness of membership in a class of objects or events, and self-other comparisons. Mussen (1960) stated that such abstractions are often part of attitude measurement.

Ordinarily a clear differentiation in the adult between the real and the fantasied is assumed. In the young child's thinking these boundaries are less distinct; the real, the imagined, the wished for, the wished away may not always be distinguishable. This fact is often lost sight of in measurement. In many of the indirect question approaches, or hypothetical situations, the unreal is toyed with, interpreted now as fantasy, now as real. That the intention may not always coincide with the plane on which the child is responding injects a source of difficulty into verbal measurements.

Language skills, the child's understanding, and his ability to express himself are critical in attitude research. Language barriers as well as experience barriers may confound the child when the experimenter asks him for a choice, an interpretation, or an expression of feeling. In verbal interactions for research purposes, unless the researcher

is tuned in to recognizing these errors or peculiarities, he can be led to erroneous conclusions.

Thought and communication are closely bound up with all aspects of development and experience. What are elicited as attitudes or values at any age should be interpreted in the light of what is known about intellectual and motivational characteristics or preoccupations at given childhood periods, and of children of given background.

Make believe themes play a prominent and public role in the language and play of the preschool age. Later, fantasies and wishes are more likely to be covert and private and more separated from reality.

In view of these multiple facets of attitude, a review of the literature on measurement of attitudes in preschool children uncovered no appropriate direct method of assessing attitudes toward different instructional modes.

Sears (1947) however, studied the influence of methodological factors on doll play performance. He found that a quiet, non-intrusive approach led to the quickest involvement of the child in doll play, and that long sessions frustrated the child. Short sessions seemed more productive.

Pintler, Phillips, & Sears (1946) studied the projective doll play of preschool children. They found that boys exhibited more aggression than girls at each age level (3, 4, 5 years).

Erickson (1958) conducted an experiment with four year old hospitalized children. She found that attitudes toward nurses, doctors, and medical procedures could be approached through doll play techniques.

The literature supports the conclusion that cognitive and affective development are related. The review failed to show the kind of attitude formed in the learner toward instructional mode, or whether this attitude affected learning. The review did not uncover any appropriate direct method of assessing attitude toward instructional mode in preschool children.

Will preschool children in various stages of development react in similar or dissimilar ways toward different instructional modes?

Piaget (1967) has identified different stages of development. During the preschool years of three and four, two levels of development appear. The earlier level is called the preconceptual stage. This stage extends from approximately 24-54 months of age. During this level of development, thinking, though representational, is not yet conceptual. According to Piaget the young child cannot yet understand how to make classes and to see their inter-relationships. Towards the end of the preconceptual stage, children's thinking develops to a point at which they are capable of giving reasons for their beliefs.

This later stage is called intuitive thinking by Piaget. It extends from approximately 54-84 months. There is development which enables children to begin to give reasons for their beliefs and actions and form some classes.

Beard (1969) stated that whereas preconceptual thinking results from an equilibrium between assimilation and accommodation, play and imitation show a predominance of one or the other. As the child advances to later stages in thinking, the attempt to adapt to the environment increases while symbolic play and representative imitation decrease in frequency.

Landreth (1962) reviewed studies on position concepts. The conclusion reached was that young children's perception of distance, position, and spatial relationships was affected both by developmental factors and experience.

The literature supports the conclusion that logically, children in various stages of development should react in dissimilar ways to different instructional modes. Children in a lower stage of development, whose thinking is still representational should not be able to function cognitively as effectively as a child in a higher stage of development whose thought process is conceptual.

Literature surveyed earlier supported the conclusion that various instructional modes were capable of developing cognitive skills in the young child. No consensus emerged



that proved any mode superior in developing cognitive skills. Even more important, no indication was found concerning the child's emotional feelings toward the instructional mode and whether those feelings affected his performance. Indications were found that children in various stages of development work and think at different levels of sophistication. No evidence was found to indicate the effect of various instructional modes on children's cognitive and affective development at different developmental stages.

### Hypotheses

As a result of the literature review, the following hypotheses were developed for study in the present research.

1. Transfer of learning and the attitude of the preschool child is a function of instructional mode.
2. Transfer of learning and the attitude of the preschool child is a function of developmental stage.
3. Transfer of learning and the attitude of the preschool child is a function of the interaction of instructional mode and developmental stage.

## Methods

### Independent Variables

Instructional mode. The instructional mode was represented by three different methods of instruction. All strategies used the same materials which will be described later. All strategies attempted to teach the same concept. The differences existed only between instructional modes.

The Experiential Manipulative mode (EM) represented instruction which enabled the child to experience, handle, manipulate and play with various objects. It also provided the child with the opportunity to have some actual control or feelings of control over the various objects in his immediate surroundings. The child decided whether or not to pick up, handle, or manipulate the objects. The decisions concerning the objects in his immediate environment were not made by the child. Within this environment, the child found that he had a high degree of control. In this way the child had the opportunity to manipulate and determine the order of objects. The literature supported the conclusion that first hand experience facilitated learning. This EM mode was designed to determine whether manipulation and physical experience with objects would facilitate transfer of learning to a new situation.

The Non-Manipulative Reward mode (NMR) represented the instructional method which permitted the child no manipulation, and no choice in ordering his environment. In it the child was the passive learner, in that the choices were all made for him and his function in the learning situation was simply to recall what someone else had decided was appropriate, and determine if this would transfer to a novel situation. This method provided reward in the form of praise for all correct responses. It resembled the operant conditioning model where the child's correct responses were rewarded and his incorrect responses were not, thus attempting to shape his behavior in the desired manner.

The Non-Manipulative Choice mode (NMC) was a compromise between the two extremes. In the EM mode the child had two different operations at his command--manipulation and determination of order. The NMR mode did not permit manipulation or determination of order. This NMC mode eliminated the child's manipulation of the environment, but still enabled him to have some control by permitting him to determine the order. Perhaps choice rather than manipulation would be the variable that would facilitate transfer of learning.

Stages. A position concept task was used to divide the children into the higher and lower developmental stages.

The task was a modification of a technique used by Hartup (1958).

The task was presented as a guessing game in which the child saw four blocks (2 red, 2 blue) and was told that the Research Assistant (RA) was thinking about one of the blocks and could he guess which one it was. The child's first guess was always incorrect, as was his second guess. The third guess was always correct thus setting the position for the "correct" block for all future trials with that child. This procedure was followed to eliminate chance guessing on the first or second trial. After each trial the blocks were rearranged. The child's score was the number of trials necessary to criterion. Criterion was defined as three successive correct trials. After all the children were given the position concept task, the scores were ordered and dichotomized at the median. Lower numerical scores indicated fewer trials necessary to achieve criterion. Higher numerical scores indicated more trials needed to attain criterion. The children with scores above the median (higher numerical scores) were identified as lower developmental stage; children with scores below the median (lower numerical scores) were identified as higher developmental stage.

### Dependent Variables

Attitude. Use was made of findings in the literature previously cited to help design a technique for measuring attitudes of preschool children toward different instructional modes. The measurement technique was as follows: All of the instructional modes took place in a red make-believe room. The child had to be able to verbally discriminate red from blue. After the child completed the learning tasks using one of the instructional modes in the red setting, he was presented with the doll play situation. Two five-inch cube doll house rooms, one totally red and the other totally blue, were set in front of the child. He was given four dolls, one at a time, to place in one of the two doll house rooms. Each doll was removed from the doll house room before the next doll was presented to the child. Of the four dolls presented to the child, two were "good" dolls (one represented the child, one represented the child's best friend) and two were "bad" dolls (one represented a naughty child, one represented a very mean child who kicked this child). Pilot studies (Appendix A) indicated that the child placed the good dolls in the doll house room of the same color in which he had experienced a pleasant situation, and the bad dolls in the alternate color. It was assumed that if the child perceived the mode of instruction as a pleasant situation, that he would place the good

dolls in the red doll house room and the bad dolls in the blue doll house room. If the child perceived the mode of instruction as an unpleasant experience, then he would place the bad dolls in the red doll house room and the good dolls in the blue doll house room.

The following method of scoring the responses was utilized. For every good doll placed in the red doll house room a score of one was recorded. For every bad doll that was placed in the blue doll house room a score of one was recorded. Thus, if the child placed both good dolls in the red room and both bad dolls in the blue room, a score of four was recorded and deemed indicative of a positive attitude toward his experience during instruction. If the child put both good dolls in the blue room and both bad dolls in the red room, a score of zero was recorded and would be taken as an indication of a negative attitude toward the instructional mode. Other combinations from one to three were also possible. The exact method used in the attitude measure is explained in the procedural section. For purposes of this study, attitude is defined as a positive approach or a negative avoidance tendency.

Transfer. The task used to measure transfer of learning was based on a similar task used by Hartup (1958). It consisted of duplicating rather than copying from

memory a row of adjacent blue, red, and yellow blocks which were shown to the child for five seconds per trial.

It is an assumption of the school that what is learned there will be used in other contexts. This assumption, according to Ausubel (1969) is more necessary than ever. The educator's problem is not merely to have the student retain what he has learned, but to provide him with the knowledge and intellectual competencies which will allow him to cope with new learning situations. Therefore a task was used to measure transfer rather than retention.

After instruction about the concepts of order and color order, the child was introduced to a novel problem, that of reproducing a given order of blocks. The task utilized six blocks (two red, two yellow, two blue) which were arranged by the RA behind a 12"X24" piece of cardboard. The blocks were out of the sight of the child. He was allowed to view the blocks for five seconds and then attempted to place his blocks in the same order. The performance criterion was one perfect reproduction of the arrangement completed by the child from his own supply of blocks.

The child's score on this transfer task was the number of trials necessary to the performance criterion. The complete description is found in the procedure section.

## Apparatus

All three instructional strategies used the following materials. The toys used in this study were all standard kinds of toys that could be purchased in most toy stores. A Fisher-Price barn was used. It had sliding doors in the roof which permitted entry into the hay loft. It had two large doors on the side which opened outward. When one of the doors was opened a sound similar to the mooing of a cow was heard. This proved to be very interesting for the children. When the doors were closed a latch held them securely closed. The inside of the barn looked very real, with the walls painted to resemble stalls, hay and other normal barn accessories.

The animals used were included with the barn. A cow, horse, sheep, and pig were used. A dog was also included in the package, but the researcher decided that a dog might not be thought of as a farm animal by the children, so it was not included. The farm animals had moveable legs and could be made to stand, sit, or lie down.

The other objects used in the learning task were three plastic toys, one red, one yellow, one blue. They were two-inch squares, one-half inch thick, with a hole in the middle where a stick could be inserted to stack them.



The blocks used in the transfer task were two-inch square plastic blocks. Four each of red, yellow, and blue were used.

The objects used in the attitude measures included two doll house rooms and four dolls. The doll house rooms were approximately five-inch cubes with an opening on one side. The rooms were originally in a large take-apart doll house. One of the rooms was covered with construction paper, the same color red as the screen used to create the red setting. This doll house room was fully covered, inside and outside. The other room was covered with blue construction paper both inside and outside. The same color blue was used as had been used in earlier pilot studies.

The dolls used were small, wooden dolls with painted faces. They were about two inches tall with green painted clothing and tan faces. Two of the dolls were male and two were female. The female dolls had plastic yellow hair, while the male dolls had hair painted on their heads.

The red instructional setting consisted of a large piece of cardboard approximately five feet by twelve feet, that had been part of a storage cabinet. The cardboard was painted a bright red color. It was curved around the table and chairs where the RA and the child interacted. The floor in the red setting was covered with poster board

that had been painted the same color red. A red tablecloth covered the table. Earlier research indicated that four year old children had shown no pattern of preference for red or blue (Appendix A).

### Sample

The subjects for the study were 42 children who were regularly enrolled in a normal preschool program at the Jewish Community Center Nursery School in Houston, Texas. There were 21 boys and 21 girls in the sample. The children were free from any severe emotional or learning disabilities. Their chronological age ranged from 48-60 months with the mean age at 53.7 months. Only children who could show verbally that they could discriminate red from blue were used.

Prior to the onset of the experiment, the researcher and the directors of the Nursery School eliminated any children who had severe emotional problems. The directors counted the number of children between four years and zero months and five years and zero months and found that there were 60 children in the age group who were eligible to participate in the study. The directors required permission slips be written and sent home with these children prior to starting the experiment. A simple explanation of the study was written with a notation that approval had been given by the directors of the school. These permission

slips were sent home with the children. When these slips were returned, 42 children were randomly selected to participate in the study. These 42 children were randomly assigned to one of the three instructional modes.

Due to scheduling problems and the full program in which the children were involved, each child was seen only one time. The position concept, the learning tasks and the attitude and transfer measures were given to the child during one session. This session lasted approximately fifteen minutes for each child.

When all the children in each instructional mode had been given the position concept task, the scores were ordered and dichotomized at the median which was found to be seven trials. Scores lower than seven (4, 5, 6) were placed in the higher developmental stage (fewer trials necessary to criterion meant better performance); scores of seven and above were placed in the lower developmental stage (more trials necessary to criterion meant lower levels of performance).

### Procedure

The Research Assistant (RA) was introduced to the children by each teacher. The children were told that the RA was going to take them into another room, one at a time, and play some games with them. At this point the RA took over and told the children that she had a toy barn,

some toy farm animals, and some blocks in another room. She said she wanted to take them, one at a time, into the other room with her to see the toys and play some games. The RA selected the children according to their position on the list indicating their assignment.

The children were taken, one at a time, into the testing room, a 9X12 foot room that served as the teachers' lounge. The room was very pleasant, a light beige color, with windows on one wall and couches and easy chairs spaced throughout the room. The red screen, table, and other equipment were set up on the end of the room away from the door. The windows had drapes which were drawn to prevent any visual distractions. The playground was on the opposite side of the building so there were no noises outside to distract the children. The teachers used the cafeteria instead of this lounge during the two days of testing so there were no interruptions. On the third and final day of testing, the lounge was to be used by another group for a meeting, so the equipment was taken to a vacant classroom and set up in the corner of the room, away from the door. This room may have been slightly more distracting for a few children since the door opened to a much used hallway. Occasionally a group of children would walk by the room talking or singing.

The subjects were taken, one at a time, from their classrooms to the testing room. During the walk down the

hallway to the testing room, the RA would talk to the children, asking them about themselves, the school, their friends, and usually some comment was made by the RA about their pretty hair, eyes, clothes or something. This procedure was used to try to establish rapport between the children and the RA, and to put the children at ease in the new situation. All of the 42 children selected for the study seemed to be very willing to come to the testing situation with the RA.

The 42 children had been randomly assigned to one of the three instructional modes after the permission slips had been returned. It was decided to complete one of the instructional modes each day to maximize procedural consistency within each instructional mode.

The initial procedure concerning the method of taking each child to the testing situation, the attitude measure, position concept task, and the transfer measure were identical for all children in all groups. The children were all treated the same coming to and going from the testing situation. The only differences were between the instructional modes. The complete procedure will be described for the first instructional mode. Only the differences will be described for the second and third instructional modes. There were two learning tasks in each instructional mode: order, which used farm animals and a barn, and

color order, which used three blocks (one red, one yellow, one blue).

The Experiential Manipulative mode (EM) was used during the first day of testing. When each child was brought into the testing room he was taken to a table sized for preschool children in the corner of the room. The table was enclosed on three sides by the red screen. The table had a red tablecloth on it, and the floor around the table was covered with red poster board.

The position concept measure was obtained first. The child and the RA sat down at the table, on opposite sides. The RA asked the child to identify the color of the make-believe room, tablecloth, and floor. The RA then placed four plastic blocks, two red and two blue, on the table in front of the child. He was told that this was going to be a guessing game. The RA said she was thinking about one of those blocks, and could the child guess which block the RA was thinking about. The child was told to point to the block he thought the RA was thinking about, and to point to a different block until he found the correct block. The child's first guess was always incorrect, but the RA said "no" in a very pleasant way, and smiled at the child and quickly said "guess again." The child's second guess was always incorrect also. The RA followed the child's second guess with a pleasant "no" and a smile

and "guess again." The third guess was always correct. On the third guess the RA would say "that's right!" This third guess set the correct position for all future trials with this child. On the second and all further trials with the child, he pointed to whichever block he thought the RA had in mind. If the child was wrong, the RA said "no, guess again" very pleasantly. If the child was correct, the RA said "YES, that's right!" After each trial with the child, the blocks were rearranged so that a different block was in the "correct" position. Each trial was recorded by the researcher, who sat approximately six feet away, where the child and the RA could be easily seen and heard.

When the child had guessed correctly on the first try in each of three successive trials, he had successfully reached the criterion for the position concept. His score was recorded as the number of trials necessary to criterion. All trials were recorded, including the first and the third successive correct trials.

When the position concept task was completed, the learning task for order was started. The RA placed a toy barn on the table. The child was asked "What is this? Have you ever seen one like it before? Do you have one like it at home?" The RA then asked the child to open the doors of the barn. When the child did this, one of the

doors activated a switch that made a sound like a cow. The child was asked what that sounded like. The child was then asked to look into the barn. He saw four farm animals: a horse, cow, sheep, and pig standing in the barn. The child was then asked to take the animals out of the barn, and identify each one. If he had any difficulty in identifying any of the animals, the RA helped him. Many of the children would talk to the RA about seeing real animals and then go into descriptions of what animals they had seen, and where they had seen the particular animals. After the animals had been taken out of the barn and manipulated for a couple of minutes, the child was told that the animals were getting tired and wanted to go back into the barn and rest. The animals, the child was told, could not decide which of them should go into the barn first. The child was asked if he would put the animals in line in some order outside the door of the barn. The child proceeded to place the animals in line. When the child had finished placing the animals in line, he was asked to tell the RA why he put a certain animal first, second, third, and last. Most children placed the horse or cow first. The children's replies varied somewhat, but most children replied in one of the following ways: "Because I wanted to!" "Because horses are bigger." "Because cows belong first." "Because the horse wanted to go in first."



"Because the cow was hungry." "Because the pig is the smallest." "Because the sheep is the nicest." "I don't know why." Any response the child made was accepted as correct. The RA simply replied "OK" to their responses.

After the child had explained why he placed the animals in a certain order, he was asked to put the animals back into the barn and close the door. When the child closed the door, the mooing sound was heard again. The child frequently said that the cow was saying good night, or talking to one of the other animals.

The RA then removed the barn and the animals from the table. The child was asked if he could recall what order he had placed the animals into the barn. Most children could recall the order. This completed the learning task for order.

The learning task for color-order was started immediately upon completion of the learning task for order. The RA placed three plastic blocks (one red, one yellow, one blue) in a stack on the table. The child was asked to identify the colors of these blocks, and then asked to take the blocks and place them in some order on the table. Since all three blocks were identical except for color, when the child placed one block first, second, or last, he was asked to tell the RA why he had placed that certain color block first, second, or last. Some of the replies

were as follows: "Because I like (yellow, red, blue) best." "Because red goes first." "Because I wanted to." "Because I don't know." Any response was accepted as correct and the RA simply replied "OK" to his responses. If the child seemed to have difficulty in answering the why, the RA quickly tried to put him at ease with a comment such as "That's OK, you just can't decide now, can you?" The RA then removed the plastic blocks from the table. This gave the child the learning task for color-order.

The attitude measure was taken next. The RA placed two small doll house rooms on the table. Each of these rooms was approximately a five-inch cube with one side completely open. One of the rooms was completely covered with red construction paper, inside and outside. The other room was covered with blue construction paper inside and outside. The rooms were identical except for color. The RA told the child that these were two make-believe rooms. The child was asked to identify the color of each room.

The child was then shown a small wooden doll. If the child was a boy this first doll presented to him was a boy doll. If the child was a girl, then the first doll presented to her was a girl doll. The child was told that this doll represented him. The child was told "Let's make believe that this doll is you. If you were going into one of these rooms to play and have a good time, into

which room would you want to go?" The doll was then handed to the child and he was asked to put it into whichever room he wanted. This researcher found in pilot studies (Appendix A) that when preschool children were exposed to pleasant and unpleasant situations in different color settings, they would place the doll that represented themselves in the doll house play room that was the same color as the room in which they had experienced a pleasant situation. When they had experienced an unpleasant situation in a certain color setting, they placed dolls that represented themselves in the alternative color doll house play room. Therefore, it was assumed that if the children perceived the learning tasks that took place in the different instructional modes as pleasant, they would place the doll that represented themselves in the same color doll house play room as that in which they had received the instructional mode (red). If they perceived the learning task in the instructional mode as unpleasant, then they would place the doll that represented themselves in the alternative color (blue).

After the child placed the doll that represented him in one of the doll house rooms, the RA said "Now you are going to come out of the room and see another child." Then the first doll was removed from the doll house play room and the child was presented with a second doll. He was told that this second doll represented a naughty

child who had been mean to him. The child was then asked to place that doll in one of the doll house rooms. It was assumed that if the child perceived the learning tasks as pleasant situations, he would place the doll that represented a naughty child in the alternate color room (blue). If he perceived the learning tasks as unpleasant situations, he would place the doll that represented a naughty child in that same color doll house room (red).

After the child had placed the doll that represented the naughty child in one of the two doll house play rooms, the RA said "This doll has played in this room long enough; let's take it out." The doll was then removed from the doll house room.

The child was then presented a third doll which he was told represented his best friend, a very nice doll. He was asked to place this doll in one of the doll house rooms. According to results of the pilot studies (Appendix A) it was assumed that if the child had perceived the learning tasks as pleasant situations he would then place the doll that represented his best friend in the same color doll house room (red), and if he perceived the learning tasks as unpleasant situations, he would place this doll that represented his best friend in the alternate color doll house room (blue).

After the child placed this third doll that represented his best friend in one of the color doll house rooms, the RA said "Now this doll has played in this room long enough; let's take it out." The doll was then removed from the doll house room.

The child was then presented a fourth doll. He was told that this doll represented a very naughty child that had been very mean to him and had kicked him. The child was then asked to place this "mean" doll in one of the doll house rooms. Again, it was assumed that if the child had perceived the learning tasks as pleasant situations, he would place the mean doll in the alternate color (blue). If he had perceived the learning tasks as unpleasant situations he would place the mean doll in that same color doll house room (red).

After the child placed the fourth doll, the RA said, "That doll has played there long enough. Let's take him out." The RA then removed the dolls and the doll house rooms from the table.

The RA then proceeded to determine whether transfer of learning had taken place by using the following measure. Six plastic blocks were placed on the table (two blue, two yellow, two red). The blocks were placed in front of the child. The RA then placed six identical blocks in front of her and told the child that she would arrange her

blocks in a certain order behind a piece of 5"X12" cardboard (on the table). The child could not see the RA arranging her blocks. When the RA had finished arranging her blocks behind the cardboard, the child was told that when the RA lifted the cardboard from in front of the blocks, he should look at the blocks and try to arrange his blocks in exactly the same way. The child was told that he would be able to see them for just a very short time, but if he didn't get his blocks all arranged correctly, that he would be able to see them for another short time. Each child was encouraged to do the task in as few trials as possible, but was not made to feel uncomfortable even if he took many trials. The RA then lifted the cardboard and allowed the child to view the blocks for five seconds and then lowered the cardboard to hide the blocks. The child then proceeded to try to arrange his blocks in the same color order that the RA had her blocks (red, yellow, blue, blue, yellow, red). When the child progressed as far as he could in the RA's judgment, he was asked to look again, and the cardboard was raised for an additional five seconds. The child did not have to start over for each trial. This procedure was followed until the child had achieved the criterion of one perfect reproduction. The child's score on this transfer task was the number of trials necessary to criterion. When this task was

completed, the child was walked back to his room by the RA and another child was brought to the testing room until the fourteen children in the EM mode were all tested.

In summary, the children in the group tested, the EM mode, all manipulated, experienced and interacted with all of the toys and objects used in the study. The children in this group also determined the order and color-order of the toys and objects used in the learning tasks. In no other mode were the children allowed to touch any of the toys or objects.

The next group to be tested was the Non-Manipulative Choice mode (NMC). This group was treated identically to the first group (EM) with the following exception: children in this group were not allowed to touch or handle any of the toys or objects used in the learning tasks (the ordering of animals in the barn game, and the color ordering of the blocks in the block game). They were permitted to determine the order of the farm animals, and the color-order of the blocks used in the learning tasks.

The NMC mode used the same introductions and procedures to take the child from his classroom to the testing room. When the child was brought into the testing room the same exact procedure was followed in the position concept measure, attitude measure, and transfer measure. The only differences between any of the instructional modes occurred in the learning task for order and color-order.

After the position concept measure was completed, the RA placed the barn on the table. The child was asked "What is this? Do you have one like it at home?" The RA then told the child to watch her as she opened the doors of the barn. When the doors were opened, the child was asked to look into the barn. He saw four farm animals (a horse, cow, sheep, and pig) standing in the barn. He was told to watch the RA take the animals out of the barn. When the animals were taken out of the barn, they were placed in a circle about twelve inches away from the barn. The child was asked to identify each animal. If the child had any difficulty identifying any of the animals, he was helped by the RA.

After the animals were identified, the child was told that the animals were tired and wanted to return to the barn to rest, but that the animals couldn't decide which of them should go into the barn first. The child was asked to tell the RA in what order the animals should go into the barn. The child was not permitted to touch the animals or the barn, but he told the RA which animal should go first, second, third, and last. After the RA lined the animals up outside of the barn in the order specified by the child, the child was asked why he wanted the certain animal to be first, second, third, and last. The children's replies were essentially the same as the



children in the EM mode. Any response the child made was accepted as correct. The animals were then placed into the barn by the RA in the order determined by the child.

The barn and animals were removed from the table by the RA. The child was asked if he remembered what animal went first, second, third, and last. If the child could recall the order, the RA replied "OK." If the child could not recall the order, the RA said, "That's OK." Most children in this group could recall the order. This completed the learning task for order.

The next task for the child was the learning task for color-order. Three plastic blocks (one red, one yellow, one blue) were taken by the RA and held in her hand. The child was asked to identify the colors of these blocks. He was not permitted to touch them. After identifying the colors of the blocks, the child was asked which color block he would like the RA to place on the table first, second, and last. When the three blocks had been placed on the table in the order determined by the child, he was asked why he chose a certain color block first, second, and third. Any response was accepted by the RA. The children's replies were essentially the same in this NMC mode as they had been in the EM mode. If the child seemed to have any difficulty responding, the RA tried to quickly put him at ease with a pleasant comment.

The RA then removed the plastic blocks from the table. This completed the learning task for color-order. This NMC mode was very similar to the EM mode except that the child was not permitted to touch, handle, manipulate or have physical experience with any of the materials used in the learning tasks for order and color-order. He was permitted to determine the order and color-order in the learning tasks.

The attitude measure and the transfer measure were conducted next. They were described in detail in the EM mode. They were both conducted in the exact same manner for all three instructional modes. The child was returned to his classroom in the very same manner for all instructional modes.

In summary, the children in this NMC mode were allowed to determine the ordering of objects in the learning tasks, but were not permitted to touch, handle, or manipulate any of the toys or objects used in the learning tasks.

In the final group tested, the Non-Manipulative Reward mode (NMR), the following differences should be noted. The children were not allowed to manipulate, experience, or determine order or color-order as they did in the EM mode, nor were they allowed only to determine order and color-order as the children in the NMC mode. The children in the NMR mode simply observed the RA manipulating the

toys and objects and they had the order and color-order determined for them by the RA. They neither manipulated nor determined order or color-order in this mode.

The same introductions and procedures were used in the NMR mode as in the other modes to take the child from his classroom to the testing room. When the child was brought into the testing room the same exact procedure was followed in the position concept measure, attitude measure, and transfer measure. The only difference between this NMR mode and the EM and NMC modes occurred in the learning task for order and color-order.

After the position concept task was completed, the RA placed the barn on the table. The child was asked, "What is this? Have you ever seen one like it? Do you have one like it at home?" The RA then told the child to watch as she opened the doors of the barn. Four animals were seen by the child (a horse, cow, sheep, and pig). The child was told to watch the RA take the animals out of the barn. The animals were then placed in a circle about twelve inches away from the barn. The child was asked to identify each animal. When the child correctly identified an animal the RA said "Good, that's right!" If the child had any trouble identifying any of the animals the RA went on to the next animal for identification without any comment.

After the animals were identified, the child was told that the animals were getting tired and wanted to go back into the barn, but they couldn't decide which of them should go first, so the RA would decide for them. The RA then lined the animals up to go into the barn. The cow was first, then the horse, then the pig, then the sheep. The animals were placed in the barn by the RA and the doors were closed. The child was then asked if he could recall which animal went into the barn first, second, third, and last. For each correct response the RA said "Yes! Very good! You're right!" and other words of praise. For each incorrect response, the RA said "no" and went on to the next one in the order. The child was not allowed to touch any of the animals or the barn during the learning task. He was not allowed to determine the order of the animals.

The RA then set the barn and animals on the floor and placed three plastic blocks (one red, one yellow, one blue) in her hand. The child was asked to name the color of each block. The child received positive reinforcement in the form of praise for each correct identification. For each incorrect identification the RA said "no," identified the color for him, and went to the next block.

The RA then said "I'm going to place this yellow block on the table first, then the red block, then the blue block. When this was completed, the RA removed the blocks from the table and asked the child "Which color block did I place on the table first, second, and last?" For each correct response the child received positive reinforcement in the form of praise. For each incorrect response, the RA said "no" and proceeded to the next one. This completed the learning task for color order.

The attitude measure and then the transfer measure were taken next. They are described in detail in the EM mode. They were conducted in the same manner for all three instructional modes. The child was returned to his classroom in the very same way for all instructional modes.

### Results and Discussion

The statistical model used for analysis of the data was a Multivariate Analysis of Variance (MANOVA) Model described in Tatsuoka (1971). The arrangement of the 2X3 model is found in Figure 1.

A total of 42 children were tested. Each instructional mode contained 14 subjects. In the analysis model shown in figure 1, instructional mode and developmental stage were the independent variables and the two dependent variables were attitude and transfer.

		Instructional Mode		
		EM	NMC	NMR
Developmental Stage	High			
	Low			

Figure 1  
Analysis Model

Due to the method of scoring, the higher numerical attitude scores indicated a more positive attitude, while lower numerical attitude scores indicated a less positive attitude. Higher numerical transfer scores indicated a greater number of trials necessary to criterion, therefore lower performance. Lower numerical transfer scores indicated fewer trials necessary to criterion, therefore better performance.

### Hypotheses

The following null hypotheses were tested.

1. There is no significant difference between dependent variable mean vectors as a function of instructional mode.
2. There is no significant difference between dependent variable mean vectors as a function of developmental stage.
3. There is no significant difference between dependent variable mean vectors as a function of the interaction of instructional mode and developmental stage.

All results are given in terms of Lambda values and probabilities of chance occurrence. The .05 level of significance was set as the criterion for rejection of null hypotheses.

Two methods of analyzing the data were used. The computer program NYBMUL: Univariate and Multivariate Analysis of Variance and Covariance, Version 4, June 1968, as it functions at the University of Houston Computer Center, and a hand method using Tatsuoka's (1971) model. The overall results were the same. Both methods were used to provide a cross check and supply additional information. The overall results of the research are shown in Table 1. A MANOVA summary table as found in Tatsuoka (1971) was used.

The row effect is developmental stage. The column effect is instructional mode. The SSCP Matrix is a sum of squares cross product matrix in which the 1,1 position is the sum of squares for attitude and the 2,2 position is the sum of squares for transfer. The 1,2 and 2,1 positions contain the sum of squares of cross products. The error term is within cell. It was calculated by adding the matrices for each of the six cells in the model to produce the SSCP Matrix for error. The ndf column indicates the number of degrees of freedom for each effect. The  $S_A + S_e$  column indicates the matrix for effect added to the matrix for error. The determinant of each matrix was found and the determinant for the error matrix was divided by the determinant for effect plus error matrix to produce the  $\Lambda$  or Wilk's likelihood ratio. This ratio was then converted to an F value using a technique described in Tatsuoka (1971).



Table 1  
Manova Summary Table

Source	SSCP Matrix		ndf	S <sub>k</sub> + S <sub>e</sub>			$\Lambda$	F
Developmental Stage (A)	0.024	1.333	1	59.452	-41.953	18272.	.7505	5.8178*
	1.333	74.667		-41.953	336.954			
Instructional Mode (B)	28.000	-18.000	2	87.428	-61.286	20253.	.6771	3.767*
	-18.000	12.333		-61.286	274.620			
A X B	5.333	7.524	2	64.761	-35.762	17467.	.7851	2.250
	7.524	27.190		-35.762	289.477			
Within Cell (Error)	59.428	-43.286	36	59.428	-43.286	13713.		
	-43.286	262.287		-43.286	262.287			

\* $p < .01$

The hypotheses will be assessed beginning with the interaction.

Hypothesis 3: There is no significant difference in the dependent variable mean vectors as a function of the interaction of instructional mode and developmental stage.

Evidence was not found in the study to reject this hypothesis in that the probability of chance occurrence was .0723.

Hypothesis 1: There is no significant difference between dependent variable mean vectors as a function of instructional mode.

Evidence was found in the study to reject this hypothesis in that the probability of chance occurrence was found to be .0079. Table 2 illustrates each variable's contribution to instructional mode differences. It also exhibits the univariate F values of each of the two dependent variables, and their accompanying probabilities of chance occurrence. The univariate F indicates a value of 8.4808 for attitude and .8464 for transfer. The step down function yields another F value for each variable and another p value. The step down function removes the effect of one variable from the other in computing the

the value (Stevens, 1972). The overall indication is that attitude differences were the major source of the between group variance.

Table 2  
Univariate Contribution of Variables  
Instructional Mode

Variable	Univariate F	p less than	Step Down F	p less than
Attitude	8.4808	.0010	8.4808	.0010
Transfer	.8464	.4374	.0683	.9341

Discriminant analysis, as a function of the computer program NYBMUL, was used to try to isolate further the contributions of each variable. One significant function was found. Table 3 illustrates the discriminant function coefficients for attitude and transfer. It provides further evidence to indicate that attitude discriminated between instructional modes. The standardized coefficients indicate that attitude contributed more than 95% of the difference between instructional modes (method described in Stevens, 1972).

Table 3  
Discriminant Function Coefficients  
Instructional Mode

Variable	Raw Coefficient	Standardized
Attitude	.790129	1.0152
Transfer	.017244	.0465

Figure 2, page 54, indicates attitudinal differences by instructional mode. Mean values for each mode are given. As can be seen in Figure 2, attitude drops as the instructional mode moves from an Experiential Manipulative (EM) mode to a Non-Manipulative Reward (NMR) mode. A univariate critical t-test (Bruning & Kintz, 1968) was used on the attitude variable alone and differences greater than .9984 between means were found to be significant at the .05 level. Table 4, page 55, indicates the means and standard deviations for attitude and transfer by instructional mode. Although transfer exhibited the same general trend over modes, its contribution was not significant when analyzed independently.

As can be seen in Table 4, the mean for attitude of the EM mode was the largest. This indicates that the EM mode generated the most positive attitude. The attitude of the NMC mode, although significantly smaller than the

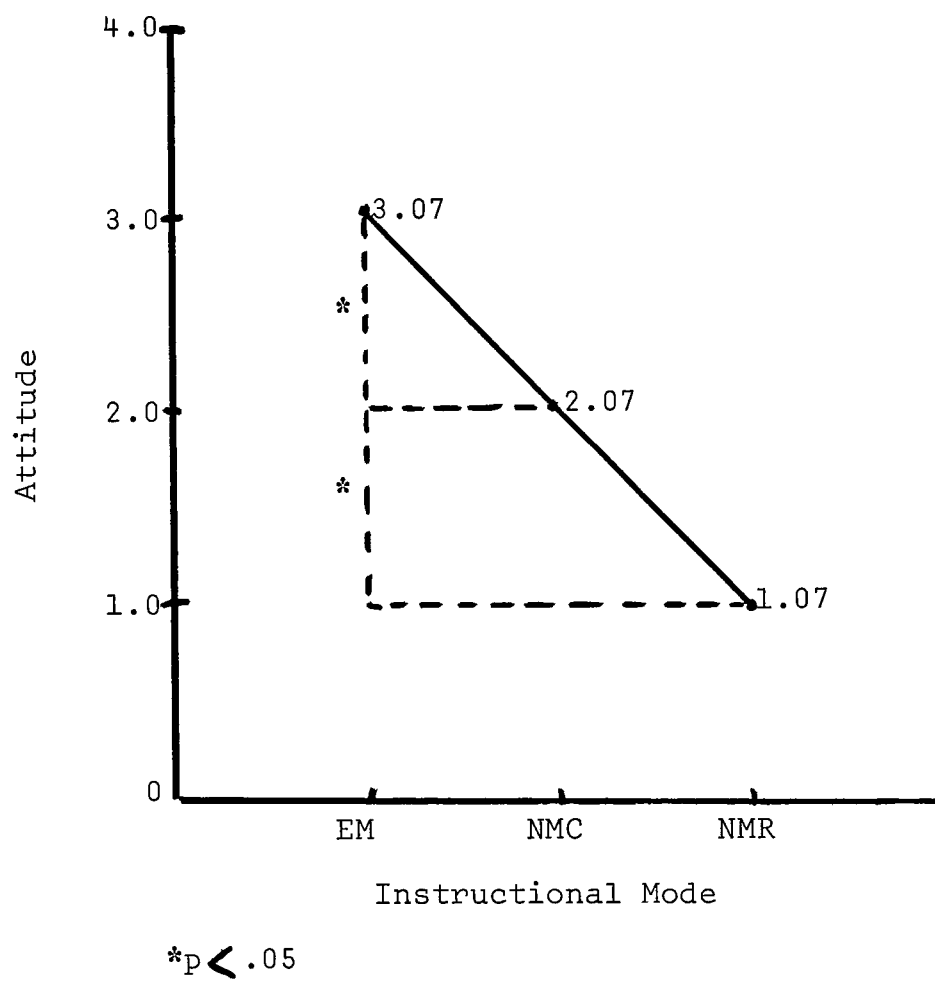


Figure 2  
Attitude Means by Instructional Mode

Table 4  
Means and Standard Deviations  
Instructional Mode

Variable	EM		NMC		NMR	
	Mean	SD	Mean	SD	Mean	SD
Attitude	3.07	.92	2.07	1.44	1.07	1.44
Transfer	4.07	1.33	5.00	3.72	5.36	3.52

EM mode, was significantly larger than the NMR mode. This ordering of attitudes indicates that children develop the most positive attitude when instructed with experiential methods that permit both manipulation and choice. Children who were denied manipulation but permitted choice exhibited less positive attitudes. The children who were denied both manipulation and choice exhibited the least positive attitudes of any group.

In summary, a significant difference was found between instructional modes. Discriminant analysis indicated that the difference was largely due to attitude. The EM mode had the largest mean for attitude, followed by the NMC mode. The NMR mode had the smallest mean for attitude.

These findings indicate that in terms of generating positive attitudes, the instructional mode which permitted manipulation and choice produced the most positive attitude.

The mode which denied both manipulation and choice produced the least positive attitude. A univariate critical t-test identified a significant difference in attitude between both the EM and NMC modes, and between the NMC and NMR modes. The attitude of children in these modes was ordered with the EM mode displaying the most positive attitude, followed by the NMC mode, and then the NMR mode.

Hypothesis 2: There is no significant difference between dependent variable mean vectors as a function of developmental stage.

Evidence was found in the study to reject this hypothesis. The probability of chance occurrence was found to be .0079. Table 5 indicates the univariate contribution of the two dependent variables, attitude and transfer to differences between developmental stages. The univariate F has a value of .0144 for attitude and 10.2484 for transfer. The p value shows the probability of chance occurrence for each variable. The step down function yields another F value for each variable and its p value. These step down values indicate the effect of one variable with the other removed. The significant contribution of transfer can be seen in Table 5.

Discriminant analysis was used to try to further isolate contributions of each variable. A significant

Table 5  
Univariate Contribution of Variables  
Developmental Stage

Variable	Univariate F	p less than	Step Down F	p less than
Attitude	.0144	.9051	.0144	.9051
Transfer	10.2484	.0029	11.6169	.0017

function was found and its discriminant function coefficients for attitude and transfer can be seen in Table 6. The standardized coefficients indicate that transfer contributed more than 72% of the difference between developmental stages. This provides further evidence to indicate that transfer discriminated between developmental stages.

Table 6  
Discriminant Function Coefficients  
Developmental Stage

Variable	Raw Coefficient	Standardized
Attitude	.314534	.4041
Transfer	.394740	1.0655

The means and standard deviations for attitude and transfer by developmental stage are found in Table 7.



Table 7  
Means and Standard Deviations  
Developmental Stage

Variable	High		Low	
	Mean	SD	Mean	SD
Attitude	2.05	1.66	2.10	1.38
Transfer	3.45	1.25	6.14	3.68

Previous results indicated that transfer was the dependent variable that discriminated between developmental stages. As can be seen in Table 7, the mean of the higher developmental stage was smaller (better) than the mean for the lower developmental stage. This indicates that children in a higher stage of development performed better on a transfer of learning task than children in a lower stage of development.

In summary, children in a higher stage of development performed significantly better on a transfer of learning task than children in a lower stage of development. There were no apparent differences in attitude.

The findings of this study answered clearly the question posed by the study: Are there differences in transfer and attitude of preschool children as a function of instructional mode and developmental stage? The evidence supports the conclusion that attitude in preschool children

is a function of instructional mode. Additional evidence was found to support the conclusion that transfer of learning is a function of developmental stage.

These findings provide evidence that preschool children do develop attitudes toward the different kinds of instructional modes. The children who were permitted choice and manipulation exhibited the most positive attitude of any group. These children could manipulate objects, and have a high degree of control and choice in their immediate surroundings. This combination of choice and manipulation seemed to generate more enthusiasm in the child toward the next task. The children seemed eager for the next game to begin. When the child left the testing situation he seemed to exhibit a very positive attitude toward the tasks he had recently completed.

Although there were no significant differences in transfer between instructional modes, the researcher and RA felt that if a simple direct retention task had been given after the learning tasks for order and color-order, the groups might have exhibited significant differences. The RA did ask the children to recall the ordering of the objects immediately following the task for order and color-order. Although no record was kept, the researcher and RA observed that the children in the EM mode seemed to be able to recall the order better than the children in the other modes.

The children who were denied manipulation, but permitted choice displayed a more positive attitude than the children who were denied both choice and manipulation. This finding demonstrates the affective value of permitting the child some amount of choice in his learning situation. Perhaps when the child perceived at least this degree of control in his learning environment, his attitude toward the learning tasks was more positive.

An additional finding in the study was that a correlation of .3467 (corrected for direction due to method of scoring) existed between attitude and transfer. This significant relationship ( $p < .05$ ) between attitude and transfer indicates that in terms of cognitive development, instructional modes which generate positive attitudes should be carefully considered. Brown (1971) stated that the denial of the development of affective behaviors may destroy or limit anticipated cognitive behaviors. Some support for his position was found in the study. The children who were denied manipulation and choice exhibited the least positive attitude. Although there were no significant differences in transfer between modes, the sample NMR group had the highest mean (lowest performance) for transfer.

Educators should be aware that children who are placed in different instructional modes develop attitudes

toward the method of instruction and that these attitudes are significantly related to transfer. Observation also indicated that they may be related to retention although this was not tested.

Educators should be reminded that children in different developmental stages learn at different levels. This study provided evidence that children in higher stages of development perform better on transfer of learning tasks. Earlier research by Piaget (1967) indicated that children think and learn at different levels. He identified the preconceptual and intuitive stages of development. This study provided further evidence to support his findings that children think differently at different stages. Educators should be reminded of this finding so that programs can be developed to meet the needs of children in different stages of development who might be within the same age group class. Many preschools currently group children into chronological age divisions. Some more advanced thinking has produced further divisions of young and old fours. Possibly future divisions would include classes for children in different developmental stages.

The results of this study partially support the literature. It does not contradict any previous findings. It goes beyond previous literature in providing evidence that preschool children develop more positive attitudes

toward instructional modes that permit manipulation and choice than modes which deny manipulation and choice. The evidence that children in a higher stage of development perform better on a transfer task was not unexpected.

Educators need to be concerned with the attitudes children develop toward the educational systems. This study provided evidence that short term attitudes are developed in preschool children. Whether these attitudes would be consistent over time is not known. A further limitation of this study was in the ethnic background of the sample. Most of the children were from middle to upper class Jewish homes. Further research should contain different ethnic samples.

### Recommendations

Based on the findings of this study, the following areas of research should prove fruitful avenues for further investigations.

1. Are the findings applicable for preschool children of different cultural and ethnic backgrounds?
2. Would children from different age groups react in similar ways to various instructional modes?
3. Would different levels of manipulation and choice produce similar results?
4. Would different measures of attitude and/or transfer produce similar results?

5. What effect would various instructional modes have on long term attitudes?

6. Would personality interact with instructional mode?

It is hoped that these questions and others, along with the information gained, will contribute to knowledge of this important educational realm.

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## APPENDIX A

The Development of a Measure of Short  
Term Attitudes in Preschool Children

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Abstract of  
The Development of a Measure of Short  
Term Attitudes in Preschool Children  
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University of Houston

A three phased study was conducted to determine if short term attitudes in preschool children could be measured with doll placement using color as a mediator.

A sample of 91 preschool children were tested. The initial phase indicated preschool children's preference for red and blue was randomly distributed.

Preschool children who were shown both pleasant and unpleasant situations, or only one situation in a color setting (red or blue) placed good dolls in the same color setting in which they viewed the pleasant situation, and bad dolls in the same color setting in which they viewed the unpleasant situation.

The results, using Chi-square ( $p < .05$ ), support the conclusion that short term attitudes in preschool children can be measured using doll placement with color as a mediator.

The Development of a Measure of Short  
Term Attitudes in Preschool Children

Joseph P. Carbonari, D. Glen Walls

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Ordinarily in the adult, a clear differentiation between the real and the fantasied is assumed. In the young child's thinking these boundaries are less distinct; the real, the imagined, the wished for, the wished away may not always be distinguishable. In many of the indirect question approaches, hypothetical situations, or doll play techniques, the unreal is toyed with, interpreted now as fantasy, now as real. Language barriers as well as experience barriers may confound the child when the experimenter asks him for a choice, an interpretation or an expression of feeling.

Many factors directly affect the study of attitudes in young children. The young child has a narrow experience range. Often the very common content about which to study attitudes may not be a part of the child's experienced world or may have very idiosyncratic meaning for him.

Mussen (1960) stated that although a child may oblige a friendly investigator by responding about things largely unknown to him, it would be in error to ascribe



attitudes to him. What are elicited as attitudes at any age should be interpreted in the light of what is known about intellectual and motivational characteristics or preoccupations at given childhood periods, and of children of given background.

Sears (1947) studied the influence of methodological factors on doll play performance. He found that a quiet non-intrusive approach led to the quickest involvement of the child in doll play, and that long sessions frustrated the child. Short sessions seemed more productive.

Pintler, Phillips, & Sears (1946) studied the projective doll play of preschool children. They found that boys exhibited more aggression than girls at each age level (3, 4, 5).

Erickson (1958) conducted an experiment with four year old hospitalized children. She found that attitudes toward nurses, doctors, and medical procedures could be approached through doll play techniques.

#### Statement of the Problem

Based on research concerned with measurement of attitudes of preschool children, a survey of literature found no one instrument or technique available to measure such attitudes successfully. The present study was concerned with the development of a technique to measure short

term attitudes of preschool children using doll play with color as a mediator.

The study was designed to meet three objectives. The first objective was to determine if preschool children's preference for red or blue was randomly distributed. The second objective was to determine if preschool children, when shown pleasant and unpleasant situations in different color settings would place dolls representing themselves and good dolls in doll house rooms of the same color as they were shown the pleasant situations, and mean dolls in the same color doll house room as they had been shown an unpleasant situation. The third objective was to determine if preschool children, when shown only a pleasant or unpleasant situation in different color settings, would place dolls in the following manner: if they were shown only a pleasant situation, would they place the good dolls in the same color doll house room and the bad dolls in the alternate color; if they were shown only an unpleasant situation, would they place the bad dolls in the same color doll house room, and the good dolls in the alternate color doll house room.

#### Method

The study was divided into three phases. The initial phase of the study was designed to determine if preschool children's preference for red and blue was randomly

distributed. Phase two and three included treatment settings prior to attitude assessment.

### Independent Variables

Setting. The setting was represented by two different colored surroundings--red and blue. In each color setting the child saw a scene created by objects of that color. The floor, walls, and coverings were all the same color.

Situation. The situation was represented by pleasant and unpleasant experiences within one of the color settings. The pleasant situation consisted of a small table and chairs with bowls of gum drops, jelly beans, chocolate candy, and a wax replica of a hot fudge sundae. The unpleasant situation consisted of a small nursery school cot and pillow. An informal survey of 12 preschool teachers indicated that preschool children probably would associate a cot and pillow with nap time, the most unpleasant part of their day.

### Dependent Variable

Attitude. For purposes of this study attitude was defined as a positive approach or a negative avoidance tendency. The following technique was used to assess attitude. In phase two, a correct placement included the following: (1) placing good dolls in the same color doll

house room in which the child had seen a pleasant situation, (2) placing bad dolls in the same color doll house room in which the child had seen an unpleasant situation. In phase three if a child saw only a pleasant situation, a correct placement included either placing good dolls in the same color doll house room in which the child saw the pleasant situation or placing the bad dolls in the alternate color. If the child saw only an unpleasant situation, a correct placement included either placing bad dolls in the same color doll house room in which the child saw the unpleasant situation, or placing the good dolls in the alternate color.

#### Apparatus

The objects used in phase one included two doll house rooms and three dolls. The doll house rooms were approximately 5 inch cubes with an opening on one side. The rooms were originally part of a large take-apart doll house. One of the small rooms was covered with red construction paper, inside and outside. The other room was covered with blue construction paper both inside and outside.

The dolls were three small wooden dolls with painted tan colored faces. They were about two inches tall, with green painted clothing. Two of the dolls were male and

one was female. The female doll had plastic yellow hair, while the male dolls had hair painted on their heads. These three dolls were used in phase one. An additional female doll was added for the second and third phases of the study.

The second and third phases used a red and blue setting. The red setting consisted of a large piece of cardboard approximately 5X12 feet, that had been part of a storage cabinet. The cardboard was painted a bright red. The floor was covered with poster board that had been painted the same color red. A red tablecloth/cot cover and pillow case were also utilized.

The blue setting consisted of a large piece of cardboard approximately 5X12 feet, that had been part of a storage cabinet. The cardboard was painted a bright blue. The floor was covered with poster board that had been painted the same color blue. A blue tablecloth/cot cover and pillow case were also utilized. The red and blue colors used to create the color settings were the same color as the doll house rooms.

### Sample

A total of 91 preschool children were tested. All were regularly enrolled in a regular preschool program. None of the children had any severe emotional or learning disabilities.

Phase one contained 39 children (18 boys, 21 girls). Their ages ranged from 42-61 months with a mean of 53 months.

Phase two contained 32 children (11 boys, 21 girls). Their ages ranged from 45-63 months with a mean of 55 months.

Phase three contained 20 children (10 boys, 10 girls). Their ages ranged from 49-66 months with a mean of 56 months.

### Procedure

During the initial visits to the preschools, the researcher was told that he would have difficulty in persuading most of the children to go with him to another room for testing. A couple of futile attempts proved this to be true. The researcher employed a female Research Assistant (RA) who had worked with young children.

Phase I. The director permitted the testing in one of the vacant classrooms. The RA went into the classroom with the director and was introduced to the children. The RA talked with the children. She told them she was going to play a game with them in another room using dolls and doll house rooms. The children went with her, one at a time, seemingly very willingly. During the walk down the hall, the RA talked with the children, mentioning their pretty dress, eyes, hair, suit, or something else to establish rapport with the child. When the child was taken into the testing room, he was seated at a small table.

In front of him were two doll house rooms, one red and one blue, with nothing in either of them. The two rooms were carefully placed so that neither color room was closer to the child. The child was asked to tell the color of each room. Any child who was unable to identify the color of each room, was not included in the study. He was permitted to play the game, but the results were not recorded.

The child was then presented with a doll and told, "Let's pretend this doll is you. If you wanted to go into one of these rooms to play, into which room would you go?" After the child placed the doll in one of the two rooms, the doll was removed and another doll presented to the child. He was told, "Here is a friend of yours; into which room would he go?" After the second doll was placed, it was removed. A third doll was presented to the child. He was told, "Here is another friend of yours; into which room would he go?" When the child finished placing the third doll, he was walked back to his classroom by the RA. This procedure was continued until all 39 children had been tested. The researcher sat at a nearby table where he could observe the child and record the results.

Phase II. This phase of the study was concerned with whether preschool children, after seeing pleasant and unpleasant situations in different color settings,

would transfer attitude through a color mediator to a doll play task.

All of the children between 45 and 66 months of age who were free from any severe emotional or learning disability were randomly assigned to one of four groups. A total of 32 children were assigned. The children were divided into four groups to offset any ordering effect of setting (red or blue) or situation (pleasant or unpleasant). Group one was shown a pleasant situation in red, then an unpleasant situation in blue. Group two was shown an unpleasant situation in blue, then a pleasant situation in red. Group three was shown a pleasant situation in blue, then an unpleasant situation in red. Group four was shown an unpleasant situation in red, then a pleasant situation in blue. All four groups had the same doll play task.

The following procedure was followed with each child in phase II. After the RA was introduced to the children, she selected each child according to his position on her list. The same procedures were used to establish rapport as had been used in Phase I. When the first child from group one entered the testing room, he was taken to the red setting. The red cardboard screen had a small table and chairs with a red tablecloth and red poster board on the floor. The child saw a bowl of gum drops, jelly beans, chocolate candy and a realistic wax model of a hot fudge sundae. The child was asked to identify the color



of the room, then to tell the RA what things were on the table, and then whether he liked them or not. The child was then taken to the other side of the cardboard screen where a blue setting had been created. The blue cardboard screen had a small cot with a blue sheet over it, a pillow with a blue pillow case, and blue poster board on the floor. The child was asked to identify the color of the room. The child was then asked to name the objects and tell how they were used. He was asked if he liked to take naps. This question usually brought a very quick NO answer.

The attitude measure was taken next. The RA placed two small doll house rooms on the table. Each of these rooms was approximately a 5 inch cube with one side open. One room was completely covered, inside and outside, with red construction paper. The other room was covered with blue construction paper. The rooms were identical except for color. The red and blue construction paper was the same color as the cardboard screen and poster board.

The child was asked to identify the color of each room. The child was then shown a little wooden doll. If the child was a boy the first doll presented to him was a boy doll. If the child was a girl, then the first doll presented to her was a girl doll. The child was told that this doll represented him. The child was told "Let's make believe that this doll is you. If you were going into

one of these rooms to play and have a good time, into which room would you want to go?" The doll was then handed to the child and he was asked to place it into one of the rooms.

After the child placed the doll, the RA said "Now you are going to come out of the room and see another child." The first doll was removed and the child was presented with a second doll. He was told that this doll represented a naughty child who had been mean to him. The child was then asked to place this mean doll in one of the doll house rooms.

After the child had placed the doll, the RA said, "This doll has played in the room long enough; let's take it out." The doll was removed from the doll house room.

The child was then presented a third doll. He was told that this doll represented his best friend, a very nice doll. He was asked to place this doll in one of the rooms.

After the child placed the doll, the RA said "Now this doll has played long enough; let's take it out." The doll was removed from the doll house room.

The child was then presented a fourth doll. He was told that the doll represented a very naughty child who had been very mean to him and had kicked him. The child was then asked to place the mean doll in one of the doll house rooms. After the child placed the fourth doll, the RA said "The doll has played long enough; let's take it out." The RA removed the doll and the doll house rooms

from the table. The child was then taken back to his classroom.

The same procedure was followed with every child in Phase II. The children in group two, three, and four received the same treatment, except for the order and sequence of the setting and situation.

Phase III. The same apparatus, materials, and doll play technique were used in Phase III. The difference between Phase II and Phase III was that the child was shown only one of the situations (pleasant or unpleasant) in one of the color settings (red or blue). The same ordering procedure was followed so that equal numbers of children viewed pleasant and unpleasant situations in red and blue settings. The same attitude measure was taken.

## Results

Chi-square analysis was used to analyze the data in each phase of the study. In Phase I, the number of dolls placed by the children in each color were counted. As can be seen in Table 8, there were no significant differences in children's preference for red or blue. Fifty-seven dolls were placed in each color. Table 9 indicates that there was no sex-color relationship. This was the hoped-for result. Original differences would have biased any further results.

Table 8  
Color Preference

Condition	Red	Blue	Total
Observed	57	57	114
Expected	57	57	114

$$\chi^2 = 0.0$$

Table 9  
Phase I

Variable	Red	Blue
Male	25	29
Female	32	28

$$\chi^2 = .5657 \text{ n.s.}$$

The results of Phase II are shown in Table 10. Correct doll placement was explained in the procedures. As can be seen in Table 10, there were significant differences between the number of dolls placed correctly and incorrectly. This indicates that children who viewed pleasant and unpleasant situations in different color settings placed good dolls in the same color doll house room in which they saw a pleasant situation, and bad dolls in the same color doll house room in which they saw an unpleasant situation. This indicates that preschool children transfer attitudes through a color mediator.

The results of Phase III are shown in Table 11. In this phase the child saw only one situation in one setting. As can be seen in Table 11, the placement of dolls differed significantly from chance. This indicates that preschool children, when presented a pleasant situation in a color setting, placed good dolls in the same color doll house room, and bad dolls in the alternate color. When preschool children viewed an unpleasant situation in a color setting, they placed bad dolls in the same color doll house room and good dolls in the alternate color.

### Discussion

The findings of this study provide evidence that short term attitudes in preschool children can be measured using doll placement with color as a mediator. Initial

Table 10

Phase II

Condition	Correct	Incorrect
Observed	97	31
Expected	64	64

$$\chi^2 = 34.00$$

$$p < .005$$

Table 11

Phase III

Condition	Correct	Incorrect
Observed	59	21
Expected	40	40

$$\chi^2 = 18.00$$

$$p < .05$$

preference for red or blue was random within the sample. Also, there were no sex differences. Most of the children did not display any strong preference for either red or blue.

Most children in Phase II and Phase III seemed to clearly see the relationship between color settings and the situations they viewed. They placed good and bad dolls with very little hesitation. Some of the children sat with each doll and seemingly thought for a short time before placing the doll. Some children verbalized their reasons for placing the dolls in each house. These reasons usually reflected their earlier experience in a pleasant or unpleasant situation in the color setting. Some children were seemingly unable to verbalize their reasons, but nevertheless placed the dolls in the appropriate location.

This study could prove to be a useful tool to assess the attitudes of children toward different methods of instruction. It could also prove useful as an indicator of children's feelings toward a counseling session or any other situation where children were exposed to any type of treatment or testing.

The results of the study show that mediators may be used as vehicles for assessing short term attitudes in young children. The value of the mediator seems to be in its ability to help the child transfer attitudes from one situation to another. The length of time over

which the mediator would still be effective was not investigated, and should be a point for further research.



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## APPENDIX B

### Parent Permission Request Form

May 17, 1972

Dear Parent:

I am working on my doctoral dissertation at the University of Houston. I am measuring transfer and attitude in preschool children as a function of instructional mode and developmental stage. I have discussed my project with Mrs. Hermann and Mrs. Gilbert and have their approval. I would like to ask your permission for your child to participate in my project. It would entail approximately 10-15 minutes of their time.

Thank you,

D. Glen Walls

For Parent or Guardian to sign: My child \_\_\_\_\_  
has permission to participate in the above described  
study.

Signed \_\_\_\_\_