INDEPENDENT BEHAVIOR OF YOUNG CHILDREN:

DEVELOPMENT OF A RESEARCH INSTRUMENT

By

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CHAPTER I

INTRODUCTION

Purpose

The purpose of this research was to develop an instrument which could be used to measure the behavioral independence of young children. Puzzles were adapted for the independence test, and a pictorial questionnaire was designed as a validation instrument. The development of the independence test was part of a larger research project in which two instruments were being developed, validated, and compared. The development of one of the instruments, the Puzzles Independence Test, and a comparison of the two instruments are included in this study.

Problem

When researchers use the word dependence in their writing, they are usually referring to emotional dependency, such as seeking approval, affection, or reassurance (Stendler, 1954; Heathers, 1955). Mature emotional dependence is considered a positive quality. The mature person, as he relates to other people, is emotionally dependent in a socially acceptable way. Society does not demand or expect him to be completely independent emotionally. For a child, mature emotional dependence occurs when he shows his dependence in a manner which is acceptable for children in his age group and possibly for children who are older. Immature emotional dependence, which is considered a negative quality,

occurs when a child shows his dependence by behaving in a manner which may be acceptable for a younger child but which is unacceptable for a child his age.

When researchers refer to independence, they are usually referring to behavioral or instrumental independence. Behavioral independence is exhibited when a child initiates his own activities and copes with difficulties without seeking help (Beller, 1955; Heathers, 1955). In this context, instrumental independence is considered a positive quality. However, when instrumental independence is compulsive and the child cannot permit himself to accept help even in difficult situations, instrumental independence is a negative quality.

The theoretical positions described above suggest that freely dependent and freely independent behavior are positive qualities, but that compulsively dependent and compulsively independent behavior are negative qualities. The person who is free to use either dependent or independent behavior is viewed as being mature and having a healthy personality, whereas the person who is either compulsively dependent or compulsively independent is viewed as being immature and having an unhealthy personality.

Creativity theory suggests that free rather than compulsive behavior is necessary for creative expression; therefore, neither the compulsively dependent nor the compulsively independent person has the freedom necessary for optimum creative living. To the extent that the present research contributes to the battery of instruments which may ultimately be used for the identification of potentially creative children, this study is seen as a contribution to the larger area of creativity research.

Emotional Dependence and Instrumental Independence

The development of independence can be seen in the psychologically free child as a spontaneous and rapid unfolding process which is inherent in the child himself. As the child develops basic trust and autonomy, independent behavior appears. In the development of basic trust, the child learns to depend on others to satisfy his physical and emotional needs, and to this extent he is emotionally dependent. After he has learned to be emotionally dependent, that is, dependent upon his mother for acceptance and approval, the child learns to be instrumentally or behaviorally independent. Thus, in Erikson's stages of basic trust and autonomy, one finds the development of emotional dependence and instrumental independence (Erikson, 1950).

The relationship between emotional dependence and instrumental independence poses a complex problem. It is a problem with which researchers have been faced in their attempts to describe dependence and independence in behavioral terms. Probably only in theory can the emotional and the instrumental aspects be separated; nevertheless, in research it has been necessary to describe emotional dependence and instrumental independence in terms of specific behaviors.

In studies of dependence and independence it is the child's relationship to socializing agents that is most frequently studied. For the infant, physical contact with an adult has reward value. Later, the mere presence of the adult has meaning for the child. Still later, the adult's paying attention and giving verbal praise or approval are rewarding to the child. Thus, as the child matures, there are changes in the ways in which he expresses emotional dependence.

Emotional dependence is evident when the responses of another

person are the child's end-goals rather than being his means for reaching goals. For example, the emotionally dependent child seeks approval, affection, and reassurance from other people; he is submissive rather than dominant in his relationships to others, and he is clinging rather than social with adults (Stendler, 1954; Beller, 1955; Heathers, 1955; Sears, Maccoby and Levin, 1957; Crandall, Preston and Rabson, 1960; Ross, 1966).

Instrumental independence is evident when the responses of another person are the child's sub-goals rather than being his end-goals. The instrumentally independent child initiates his own activities, and copes with difficulties without seeking help. He is persistent, and he wants to do things by himself because he values his own work rather than the approval of others (Heathers, 1955).

There are times that a child may need help in order to achieve his goal successfully, and the importance of this help being offered in a way that does not destroy the child's feeling of independence has been pointed out by Waring (1939). Referring to the times when a child is unable to achieve without help, she stated: "Giving help as needed, occasionally, during an undertaking, otherwise letting the child alone, encourages him to do all he can on his own (Waring, 1939, p. 30).

Procedure

The following steps were involved in the study of independence as it relates to sex and age in young children:

1. Literature was reviewed in order to gain an understanding of the theories of independence and of the research methods which have been used to measure independence in young children. The literature was

reviewed cooperatively with Mrs. June Patton, whose thesis research was coordinated with the research reported in this study.

2. A research instrument, the Puzzles Independence Test, was developed.

3. The Puzzles Independence Test was administered to 102 boys and girls ranging from two years ten months through six years four months. A pictorial questionnaire, developed as a validation instrument, was administered to 48 of these children. An alternate research instrument, the Puzzle Box Independence Test developed by Patton (1969), was administered to 74 of the children.

4. Data were analyzed and interpreted. This step of the research, which included a comparison of two independence tests, was done in cooperation with Patton.

5. Recommendations were made for future study.

CHAPTER II

REVIEW OF LITERATURE

The review of literature will include (1) research methods used in measuring independent behavior, (2) findings related to independent behavior, and (3) implications for the present research.

Research Methods

Research methods used in the study of independence include observations during free play, observations in structured situations, interviews and questionnaires, and research instruments specifically designed to measure independence.

Observations During Free Play

Some researchers have studied independence by observing children during their free play. One technique frequently used in these studies has been time-sampling, in which the child's behavior is observed for brief intervals over a period of days or weeks. With this method the recording may be either detailed running records or anecdotal records of behavior which falls into predetermined categories, such as incidents in which the child relates to peers or relates to adults. These records are then analyzed for evidence of dependent and independent behavior. For example, incidents of non-distractibility and persistence would be labeled as independent, and incidents of clinging and seeking attention

would be labeled as dependent. The final data analysis may then be a simple numerical count of the incidents of behavior that occurred in each category (Heathers, 1955; Crandall, Preston and Rabson, 1960; Clapp, 1966).

In some studies in which the time-sampling technique has been used, the children's behavior has been categorized at the time of the observations. These data have been analyzed in terms of the frequency of each type of behavior or in terms of the relative amount of time that a child spends in each type of behavior (Marshall and McCandless, 1957; Clapp, 1966).

A less structured method of observation has also been used in the study of independence. This method provides for the children to be observed informally over a period of weeks or months and then rated without the benefit of written records. In one such study the observers were instructed to be alert to the children's behavior in certain routine situations during the weeks of observation prior to the rating. At the end of the observation period the children were then rated on a scale designed to identify various degrees of dependent and independent behavior. For this type of rating, Beller (1955) used a scale which consisted of specific questions about children's independent behavior. These questions measured the extent to which a child might, for example, seek help, seek recognition, or do routine tasks alone. In a more recent study, Clapp (1966) used a scale designed to give a global picture of a child's dependence or independence in relation to peers, adults, and objects.

Observations in Structured Situations

Some researchers have studied independence by observing parent-child interactions in structured situations.

Gewirtz (1954) studied the attention-seeking behavior of young children when an adult was nearby and attentive (high-availability) and when an adult was at a desk busy with papers (low-availability). In both situations the child was occupied with easel painting. Gewirtz was interested in the effect that the availability of the adult would have on the child's attention-seeking behavior, and he was interested in the joint effect of the sex of the child and the sex of the adult on the child's behavior. The data recorded during the observation of each child included his casually spoken comments and questions, and his attention-seeking behavior which could range from momentary glances toward the adult to urgent requests for overt attention from the adult. The data analysis included other variables, such as the number of paintings the child completed and the total time that he remained in the session. The results indicated that attention-seeking behavior was significantly greater under the low-availability condition than under the high-availability condition, and that boys directed more attention-seeking behavior toward women than toward men.

Smith (1958) studied methods of gathering data about mother-child interactions by comparing observations and interviews. The mother and the child were observed while the child played with available materials, and then the mother and child were observed while the mother completed a questionnaire. The latter situation provided an experimental measure of the mother's behavior toward the child's dependency solicitations when she was busy. In both situations the mother's behavior and the child's

behavior were recorded in terms of categories with listings such as, asking for help and giving reward. Smith found that dependency was negatively related to the mother's compliance and to her rewarding behavior. The more the mother complied with requests, the less verbal help or attention was requested by the child. Smith also found that the more the mother left the field or punished the child, the more frequently the child asked for physical help. For boys and girls, total dependency was negatively related to the amount of punishment given by the mother; and for girls, total dependency was positively related to the warmth of the mother.

Clapp (1966) studied the relationship of parental treatment of young children (four-year-old boys) to the children's dependence and competence. These conditions were similar to the low-availability and high-availability as described by Gewirtz (1954). The child and both of his parents were observed interacting while the parents completed various written questionnaires. Toys were available for the child while both of his parents were occupied. During the observations, judges rated the parents' behavior and the child's behavior according to predetermined categories, such as asking for help, attention, or praise. Competence, as used by Clapp, was essentially the same as independent behavior. He found that parents of competent children treated their sons as children rather than treating them as adults or as infants. These parents were judged to be more permissive and warm in their relationship to their children, more competent as models, and more consistent in their philosophy and actions than were the parents of the dependent children.

Hatfield, Ferguson and Alpert (1967) were interested in mother-child

interactions and the socialization process. In studying the independence aspect of socialization, they used observations with one session in which the mother was occupied filling out a questionnaire and another session in which the mother was unoccupied and attentive to the child. When the mother was unoccupied, the child played with puzzles and a fishing game, and the mother could help him if she chose to do so. Interaction between the child and mother was encouraged by the presence of adult-size equipment and child-size equipment. The verbal interchange between the mother and child was tape recorded and a running commentary of the non-verbal and expressive behaviors of both mother and child was made by an observer. These records were then used in designing a rating scale. The rating scale was used in judging the children's dependent behavior and the mothers' attitudes toward dependence, independence, achievement, and orderliness. For boys, the results indicated that dependence was related to the mother's warmth, and independence was related to low maternal directiveness, low hostility, and low use of models as a method of influencing the child's behavior. For girls, the results indicated that dependence was related to the mother's rewarding of dependent behavior and to her lack of concern about orderliness, and independence was related to pressure to conform to adult role behavior and reward for that behavior.

Interviews and Questionnaires

Most researchers have used questionnaires and interviews with parents in their study of dependence in young children.

Stendler (1954) studied the relationship of over-dependency in young children to the mother's approach to infant disciplines. A five-

point scale was prepared and used by first grade teachers to rate their children. The scale was concerned with the child's need for help and attention in the classroom, and the mother's tendency to overprotect the child. On the basis of these teacher ratings, two groups of children were chosen. One was the experimental group which was designated by the ratings as overdependent. The other was a control group with whom the experimental group was compared. The mothers of these children were interviewed to obtain information concerning four specific areas of dependency: eating, physical habits (dressing, bathing, sleeping), playing with others, and contact with parents. The mothers were also interviewed in regard to training practicies with specific reference to feeding, weaning, and toilet training. Stendler found evidence that overdependency can result from maternal over-protection. Her data also supported the theory that overdependency can result from serious discontinuities in the socialization process during a critical period.

Sears, Maccoby, and Levin (1957) made an extensive study of child-rearing patterns. Mothers were interviewed about their training practices and attitudes in areas of feeding, toilet training, sexual behavior, dependency, and aggression. The interviewer was guided by a set of specific questions, but free and detailed responses were encouraged throughout the interviews. In this particular study, the questions related to dependency training were primarily focused on emotional dependence rather than instrumental independence which is the focus of the present study.

Smith (1958) studied methods of gathering data about mother-child interactions by comparing observations and interviews. The interview was conducted in the home with only the mother and the trained

interviewer present. The interview consisted of 36 open-end questions related to such variables as infant care and training, present demands made upon the child, amount and kinds of attention requested by the child at home, and the mother's way of responding to the dependent behavior of her child. The behaviors reported in the interviews were classified according to the nature of the dependency solicitations described by the mother. Smith was interested in emotional dependency (clinging or whining), physical dependency (wanting help while dressing), the conditions under which dependency occurred, and the areas in which the child tried to be independent.

Clapp (1966) studied the relationship of parental treatment of young children (four-year-old boys) to the children's dependence and competence. He developed a questionnaire for use with the children themselves. The questions were related to aspects of parent-child relations such as the amount of independence allowed and how the parents responded to dependent behavior. The interview records were analyzed in terms of global categories of competence or dependence on peers, adults, and objects.

Research Instruments Designed to Measure Independence

Several types of puzzles have been used in experimental situations to measure the independent behavior of young children. Children who have completed the puzzles with little or no help have been identified as behaviorally independent, and children who have requested or accepted help in order to complete the puzzles have been identified as behaviorally dependent.

Tether (1961) was interested in independence as one criterion of

conscientious effort. She used inlay puzzles in order to measure the independence of first grade children. These children were tested individually and were given help in completing the inlay puzzles whenever they requested help or accepted an offer of help. Tether found a significant difference between the boys and girls in her study. Girls frequently requested and accepted help, whereas boys did not request help and rejected offers of help.

Another instrument which has been used in the study of behavioral independence of preschool children is a puzzle box, which is a modification of the puzzle box used by Keister (1937) in her study of children's reactions to failure. Griffin (1954) adapted the puzzle box for use as an independence test; and subsequently it was used by White (1965) and Baxter (1968). The puzzle box test consists of a shallow box which contains wooden cutouts of familiar objects. Only when these pieces are placed flat in the box can the lid be closed. In spite of the fact that there are several ways to put the pieces into the box, the problem is difficult for young children and it provides a situation in which they need help to complete the task. In the administration of the puzzle box test, the child is offered help at regular intervals and is also given help each time he requests it. Each child's behavioral independence score is determined by the number of times that he actually accepts help.

Findings Related to Independence

A variety of research methods have been used successfully in studies of dependence and independence. Observations during free play, observations in structured situations, and research instruments specifically desgined to measure independence have been used most successfully

with young children. When parents have been included in the research, observations in structured situations and interviews or questionnaires have been most frequently used. Interviews have the advantage of allowing coverage of a wider range of behavior, but direct observations enable the researcher to discriminate among various degrees or categories of dependence and independence (Smith, 1958).

Emotional dependence tends to shift away from a passive, infantile dependence on adults to a more active and assertive dependence on peers. Emotional dependence on adults declines with age relative to dependence on other children, and dependence on adults accompanies relatively low peer acceptance and participation (Heather, 1955; Marshall and McCandless, 1957).

The degree of adult availability influences the amount of attention seeking behavior displayed by young children. Children seek more attention when with an adult in a low-availability situation (Gewirtz, 1954).

Independence training is not predictive of children's achievement behavior; however, high achieveing children tend to be independent rather than being dependent upon adults for help and emotional support (Crandall, Preston and Rabson, 1960).

Dependency is negatively related to the amount of punishment given by the mother and, for girls is positively related to the warmth of the mother (Smith, 1958).

Girls who are more feminine are more independent, and girls who are less feminine are more dependent (White, 1965).

Parents of independent boys tend to treat their sons as children rather than as infants or adults. These parents tend to be permissive, warm, competent as models, and more consistent in their philosophy and

actions toward their sons (Clapp, 1966).

For boys, independence is related to low maternal directiveness, low hostility, and low use of models as a method of influencing the child's behavior. For girls, independence is related to pressure to conform to adult role behavior and reward for that behavior (Hatfield, Ferguson, and Alpert, 1967).

Implications for the Present Research

In the area of creativity research in particular, instruments which are able to measure the extent to which a child is free to be independent or dependent are now needed. The identification of factors which influence the development of a child's creative potential can only be achieved if the characteristics related to creative ability can be measured in early childhood; and one of these characteristics is freedom to behave in an independent or dependent manner.

Some researchers have focused on emotional independence and others on instrumental independence. The design of the present research instrument limits this study to the measurement of instrumental independence. Age and sex are variables included in this study. The findings of previous studies have suggested the possibility of age differences and sex differences in both emotional dependence and instrumental independence.

Baxter (1968) pointed out that during an experimental situation the child should feel success after he has been given help. She also suggested that the children who were rated as independent on her task included children who were compulsively independent and children who were freely independent. The design of a new research instrument should be

such that success will be obious to the child, and the instrument should be sufficiently sensitive to identify more discrete degrees of independence.

CHAPTER III

METHOD AND PROCEDURE

This chapter will include (1) the development of the independence test; (2) a description of the Puzzles Independence Test, its administration and scoring; (3) the development of the validation questionnaire, its administration and scoring; (4) a description of the subjects who participated in this study; and (5) recommendations for data analysis.

Development of the Instrument

Puzzles, which had been used by Starkweather (1966) to measure preschool children's willingness to try difficult tasks, were adapted for use in measuring independence. These puzzles were appropriate because they could be adjusted to each child's ability and each child could then be offered a task which was difficult and yet possible. The fact that the puzzles would be difficult provided a situation in which it would be logical to offer help to the child. This combination of a difficult task and an opportunity to secure help was needed for the measurement of behavioral independence.

A few changes were necessary in order to adapt the puzzles for use as an independence test. As originally used, the puzzles ranged from a two-piece puzzle to an eight-piece puzzle; and they were used in a situation in which the children were offered no help whatsoever. As an independence test, in which help would be offered, at least one more

difficult puzzle was needed in order that the task be sufficiently difficult for the older and more skillful children.

The development of a method of administering the test required several small pilot studies. At first, the puzzles were presented to a child one at a time and he was given the choice of doing the puzzle alone or doing it together with the experimenter. The children were willing to make the choice, but frequently their choice had nothing to do with independent behavior. Some children apparently chose to work a puzzle together with the experimenter because they felt she wanted to have a turn.

Another method of administering the puzzles was devised in an attempt to clarify for the child what was meant by doing a puzzle "alone" and what was meant by doing it "together" with the experimenter. The puzzles were divided into two groups, one group being designated as puzzles the child would do alone and the other being designated as puzzles he would do with the experimenter. The child then made his choice of a puzzle from one group or the other. With this method of administration, the children did seem to understand the meaning of the two situations, but the measurement of independence was not clear. For example, a child might choose to work the puzzle independently and yet want help when he realized that the puzzle was difficult for him. The child's choice, when considered by itself, was not an adequate indication of the child's independence.

The problems that were related to the scoring of independent behavior served to indicate final adjustments that were needed in the Puzzles Independence Test. Logically, there were three factors in the puzzles task that were related to a child's independence. These were (1) the

number of pieces in the puzzle, (2) the number of pieces the child attempted to put into the puzzle frame, and (3) the number of times the child accepted help. Scoring, which took these three factors into consideration, was possible when the child was offered relatively difficult puzzles, and when he was offered help at regular intervals and given help whenever he requested it. The final instrument was designed to satisfy these criteria.

The Puzzles Independence Test

The Puzzles Independence Test consisted of (1) a pretest in which a puzzle was demonstrated and the child's ability was determined, and (2) a set of eight puzzles, graded in difficulty and administered in a way that permitted the child to behave in a dependent or independent manner.

Pretest

The pretest consisted of four puzzles, illustrated in Figure 1. The pretest was introduced with a three-piece demonstration puzzle, which provided an opportunity for the child to learn how the puzzles were to be done. The child was then timed on two three-piece puzzles and one four-piece puzzle. The sum of the time required to complete these three puzzles indicated the child's ability and was the pretest score. On the basis of this score, puzzles of appropriate difficulty for the child were chosen for the independence test. The ability groupings as developed by Starkweather (1966) were used (see Table I).

Puzzles

The puzzles for the independence test consisted of eight levels of

Demonstration
Three-piece Puzzle
Orange Bird

Trial No. 1
Three-piece Puzzle
Tan Monkey
(timed)

Trial No. 3
Four-piece Puzzle
Turquoise Indian
(timed)

Trial No. 2
Three-piece Puzzle
Light Green Bear
(timed)

Figure 1. Pretest for Puzzles Independence Test

TABLE I

PRETEST FOR THE PUZZLES INDEPENDENCE TEST

Ability Group	Pretest Timing (in seconds)
Group I	30" or less
Group II	31" to 45"
Group III	46" or more

difficulty. They ranged from a two-piece to a ten-piece puzzle and are illustrated in Figures 2 and 3. For each child, the test consisted of eight puzzles which represented six of these levels of difficulty. The last two puzzles presented were always puzzles representing the easier levels of difficulty in order that the child have success at the end of the test. The sequence of puzzles offered to the children in each ability group is presented in Table II.

The puzzles were rectangular in shape and approximately four inches by six inches in size. The puzzle pictures were painted a solid color on a white background and bordered in black. Two puzzle frames were used. One was used to hold the picture which showed the child what his puzzle would look like, and the other was the frame in which the child constructed his puzzle (see Figure 4).

Administration

The two puzzle frames were placed on the table before the child. The picture for the first puzzle was placed in one puzzle frame, and the

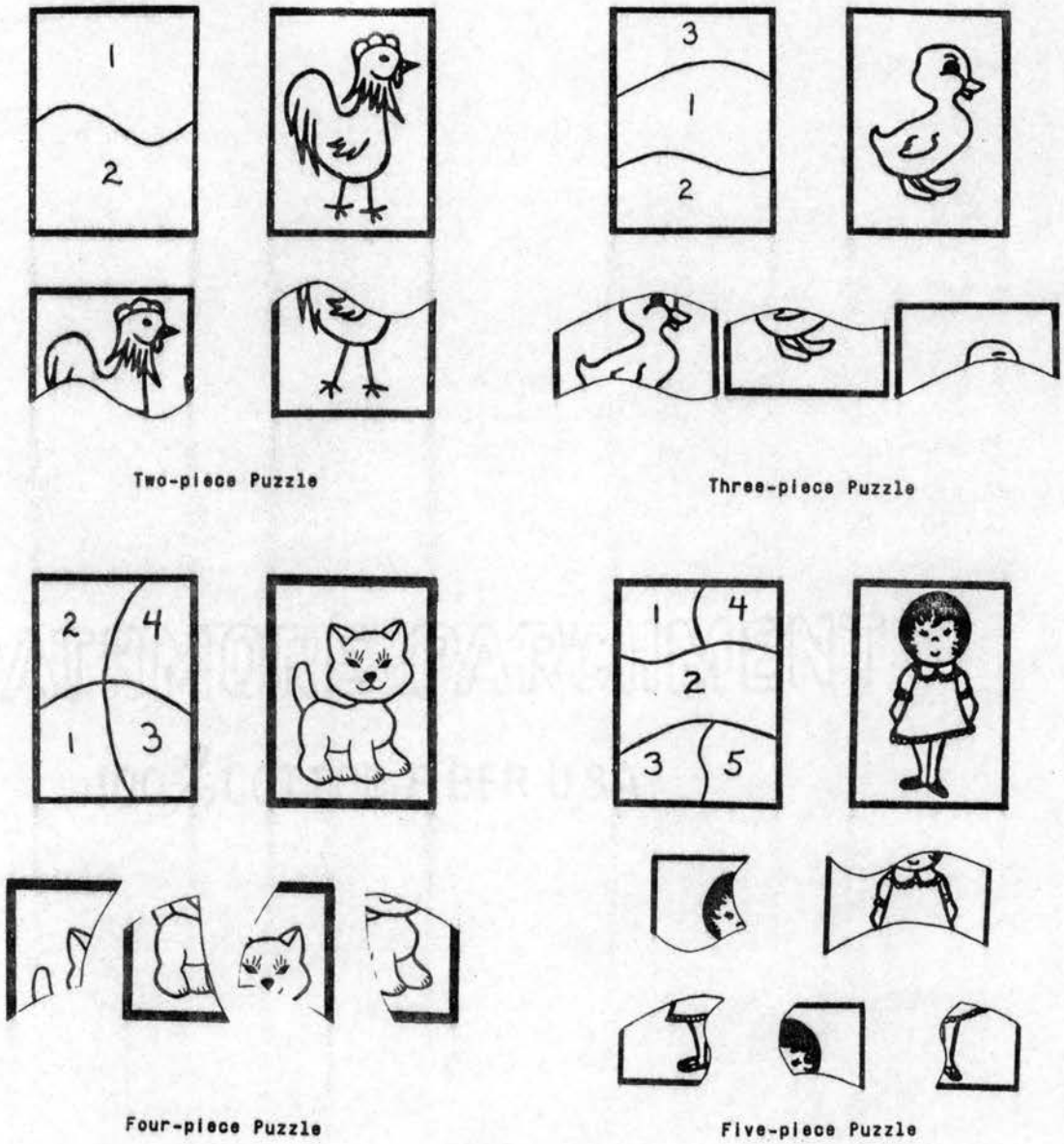


Figure 2. Puzzles Independence Test: Two-piece, Three-Piece, Four-piece, Five-piece Puzzles

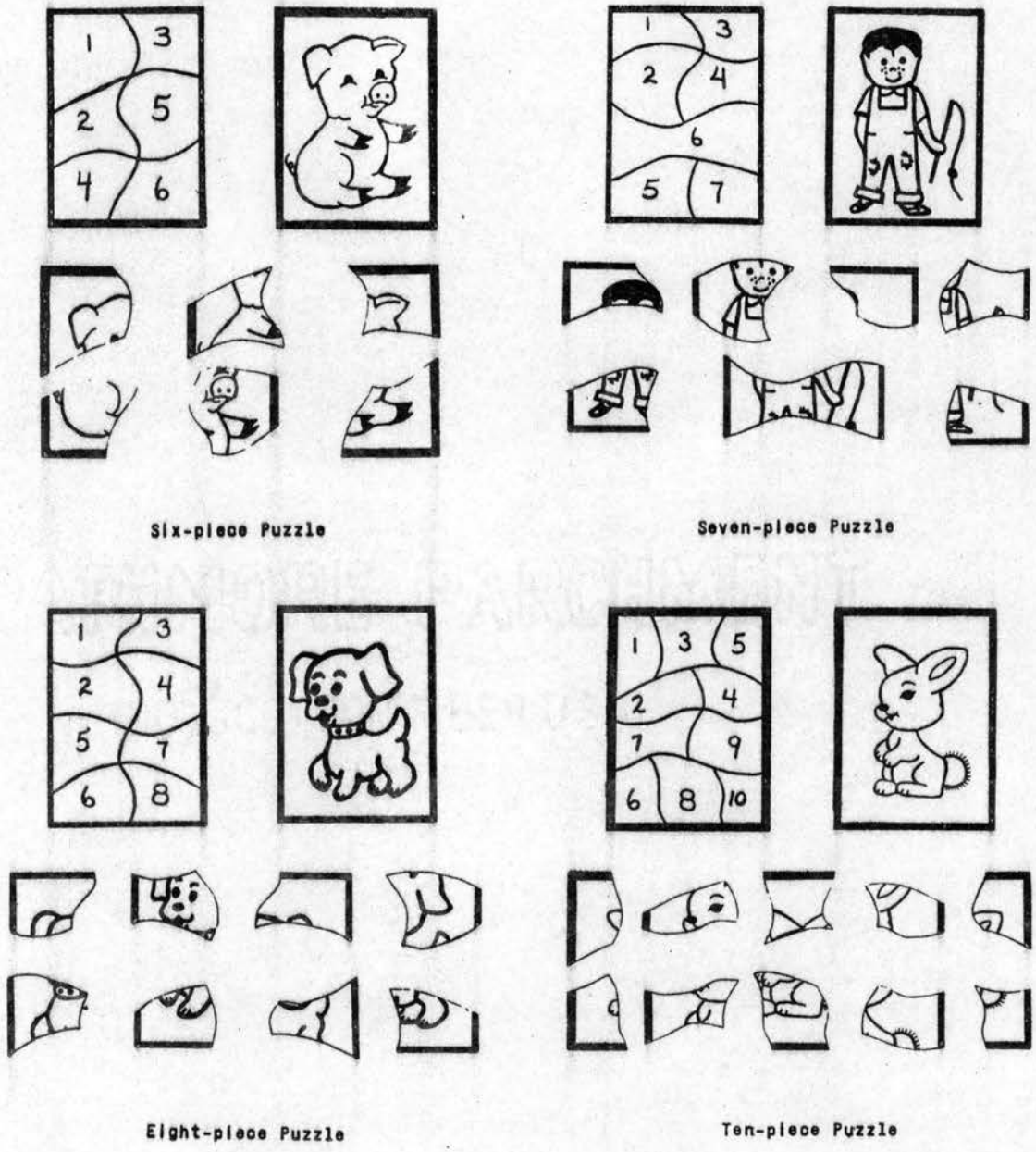


Figure 3. Puzzles Independence Test: Six-piece, Seven-piece, Eight-piece, Ten-piece Puzzles

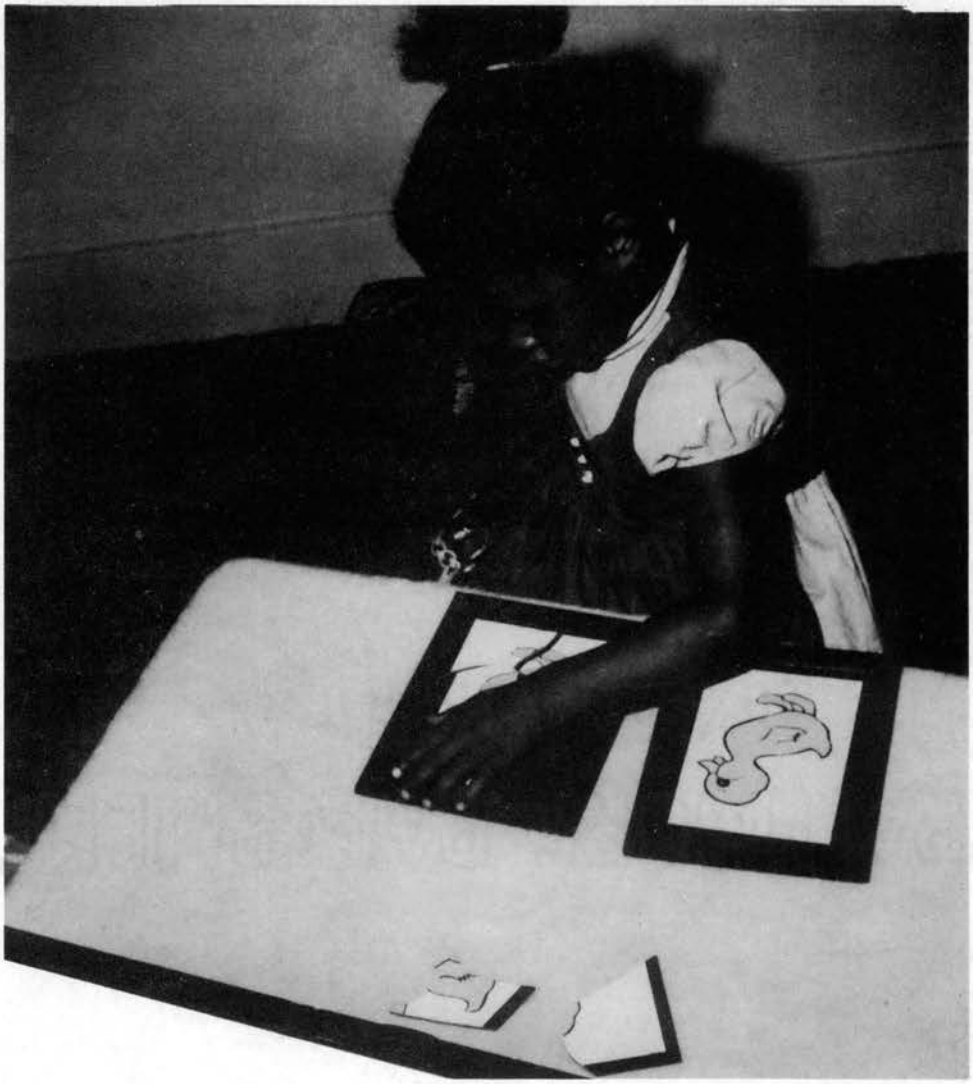


Figure 4. A Child Constructing a Four-piece Puzzle

TABLE II

ORDER OF PRESENTATION OF PUZZLES* FOR THE THREE ABILITY GROUPS

Group I (High)	Group II (Middle)	Group III (Low)
4-piece	3-piece	2-piece
5-piece	4-piece	3-piece
6-piece	5-piece	4-piece
7-piece	6-piece	5-piece
8-piece	7-piece	6-piece
10-piece	8-piece	7-piece
7-piece	6-piece	5-piece
5-piece	4-piece	3-piece

*Each puzzle is identified by its number of pieces.

pieces for the puzzle were placed below the other frame in front of the child. The child was told, "You can make a (duck) just like this. I'll help you if you need me to." The child then began to construct the puzzle by himself. If the child asked for help in working the puzzle, the experimenter put one piece into the frame correctly and removed any incorrectly placed pieces. If the child commented about the puzzle being hard, or asked where a specific piece went, or if he stopped working the puzzle and just looked at the experimenter, she offered to help him. Under these circumstances, help was given only if the child clearly indicated that he did want help. If the child did not ask for help or indicate that he might need help, he was offered help at regular

intervals. Whenever the child had worked independently and had tried to place as many as ten pieces in the puzzle, the experimenter asked if he would like help. Again, help was given only if the child clearly indicated that he wanted help. If a child worked independently on a difficult puzzle and could not complete it, he was told that he could put that puzzle away and try another one.

Scoring

The scoring of the Puzzles Independence Test took into consideration (1) the number of pieces in the puzzle, (2) the number of pieces the child attempted to put into the puzzle frame, and (3) the number of times the child accepted help. Each child's independence score was determined by the relationship between the level of difficulty at which he chose to work and the extent to which he accepted help. The independence score equals the mean level of difficulty at which the child chose to work divided by the mean amount of help that he accepted.

The score sheet for Child F-1665 is presented in Figure 5, and is used to illustrate the method of scoring. The vertical marks indicate the number of attempts the child made in completing each puzzle. For example, Child F-1665 made four attempts in completing the 4-piece puzzle and made 17 attempts in completing the 5-piece puzzle. Each "o" indicates a point at which the experimenter offered to help the child, and the "?" signifies a point at which the child's behavior indicated that she might want help. The "h" shows that the child accepted help at that point. In the illustration, Child F-1665 was offered help (o) after making nine attempts to complete the 6-piece puzzle, but she refused help at that time. After seven more attempts, she made a comment

SCORE SHEET - PUZZLES INDEPENDENCE TEST

Name Child F-1665 Code No. F-1665

Birthdate 5-13-65 Age 3:10

School Lab. I Date 3-21-69

Time on Pretest 80" Group III

2-piece ||

3-piece |||

4-piece ||||

5-piece ~~||||~~ |||| o ~~||||~~ |||

6-piece ~~||||~~ |||| o ~~||||~~ || ? oh ||||

7-piece ~~||||~~ |||| oh ||||

5-piece ~~||||~~

3-piece |||

Puzzle	Attempts	Level of Difficulty	Help
5-piece	17	3.400	0
6-piece	20	3.333	1
7-piece	13	1.890	1
		8.590	2

Mean Difficulty : 2.863
Mean Help : 0.666
INDEPENDENCE SCORE : 4.300

Figure 5. Method of Scoring the Puzzles Independence Test

which suggested that she might want help (?), and help was offered by the experimenter (o). The child clearly indicated that she wanted the help and so the experimenter placed one piece in the puzzle frame correctly (h). Child F-1665 then made four more attempts and completed the puzzle.

The scoring of the Puzzles Test takes into consideration all of the puzzles with which the child had some difficulty. These would be the puzzles on which the child accepted help and the puzzles for which her attempts exceeded the number of pieces in the puzzle. For this child, only the 5-piece, 6-piece, and 7-piece puzzles were used in figuring her independence score.

The steps involved in figuring the independence score are as follows:

1. The level of difficulty at which the child chose to work the puzzle is figured by dividing the number of attempts by the number of pieces in the puzzle. For Child F-1665, the level of difficulty for the 5-piece puzzle is $17 \div 5$, or 3.40.

2. The mean level of difficulty is figured by summing the levels of difficulty and dividing this figure by the number of puzzles with which the child had difficulty. For Child F-1665, the sum is 8.590. This sum divided by 3 yields a mean level of difficulty of 2.863.

3. The mean amount of help is then figured by dividing the number of puzzles with which he had difficulty. For Child F-1665, help was given twice during the three puzzles with which she had difficulty. The mean level of help for this child is $2 \div 3$, or 0.666.

4. The independence score is then figured by dividing the mean level of difficulty by the mean level of help. For Child F-1665, this

is $2.863 \div 0.666$, or 4.30.

Development of the Validation Instrument

The Puzzles Independence Test is so designed that it has face validity. The puzzles offer the child a situation in which he is faced with a difficult task and has the option of working by himself or accepting help. In such a situation, a child who prefers to work by himself is behaviorally more independent than the child who accepts help. Nevertheless, the puzzles are simply one type of situation and may or may not reveal the independence that the child shows in his everyday activities.

Instrumental independence is frequently judged on the basis of whether a child performs daily tasks by himself, as opposed to being dependent upon an adult to perform the tasks for him. This fact suggested the possibility of obtaining a general picture of the child's instrumentally independent behavior by using a pictorial questionnaire which would give him choices in a variety of everyday situations. The criteria for the questionnaire were (1) that it be of interest to young children, (2) that it be personal so that the child could identify with the situation and respond with a true idication of his actual behavior, (3) that it offer the child a choice between dependent and independent behavior, and (4) that it portray daily tasks which are common to many children.

As a first step in the development of the Pictorial Questionnaire, mothers were interviewed to obtain examples of occurrences in a child's day. Four degrees of independence were identified: (1) the adult performs the task alone, (2) the adult performs the task and the child

helps, (3) the child performs the task and the adult helps, and (4) the child performs the task alone. A variety of daily situations were chosen and pictures were drawn to illustrate these four degrees of independent behavior; however, it was difficult to distinguish between the two "helping" situations (2 and 3 above); therefore, the Pictorial Questionnaire was constructed using only three degrees of independence, which were (1) the adult performs the task, (2) the adult and child perform the task together, and (3) the child performs the task.

The Pictorial Questionnaire was administered to only two children before it became apparent that the wording of the story was too complex for a child to follow. For example, in a toothbrushing situation in which the mother helped, the original description was as follows: "This girl is holding the toothbrush and the mother is holding her hand so she can help her brush." When the wording of the story was simplified, the caption for this picture read, "This girl brushes her teeth and mother helps."

With the wording simplified, the Pictorial Questionnaire was administered to six more children and other problems became apparent. The children were not able to distinguish between the different degrees of independent behavior when the mother appeared in both pictures. For example, the toothbrushing situation was still confusing because the mother and child were in both pictures. The mother was present when she helped the girl brush her teeth (2), and the mother was present when she brushed the girl's teeth (1). To eliminate this type of confusion, the situations in which the mother and child appeared in both pictures were eliminated from the questionnaire. Other situations with which the children were apparently not familiar were also eliminated. For

example, the children readily recognized that groceries were carried in from the car after one had been shopping, but they seemed puzzled by a picture of putting the groceries away once they were in the house. The questionnaire, which began with 41 pages of paired pictures, was reduced to 24 pages after this refinement, and each page offered the child a simple choice between a dependent and an independent situation.

Still another change was made in the wording of the captions in order to increase the child's personal involvement in the situations. Originally the wording was, for example, "This girl puts her own socks on (pointing), and this mother puts the girl's socks on for her (pointing). What happens at your house?" The wording was changed to a simple question, such as, "Do you put on your socks or does your mother put on your socks?"

Pictorial Questionnaire

The Pictorial Questionnaire, reduced in size, is illustrated in Appendix C. The final instrument consisted of 24 paired pictures which gave the child a choice between two situations, one dependent and the other independent. Two questionnaires were designed, one for boys and one for girls. The situations and the captions were identical in the two questionnaires. The only difference was in the sex of the child pictured.

Administration

The Pictorial Questionnaire and two crayons were placed on the table in front of the child. The experimenter told the child that he could choose the color crayon he liked best. She then explained, "This

is a little picture book, and I'm going to write your name on the front. Then we will look at the pictures and read the story and I want you to help me make it a story about you." As the experimenter then turned the pages of the Pictorial Questionnaire, she read the caption and pointed to each picture as she asked the child to choose the one that was about him. For example, "It's time to go to breakfast, so let's put slippers on. Do you put your slippers on (pointing), or does your mother put your slippers on (pointing)?" The child made his choice and made a mark on the circle under the picture he had chosen. This method of indicating the child's choices involved the child and simplified scoring. The Pictorial Questionnaire was administered to 48 children, boys and girls ranging in age from 3 years 1 month to 6 years 4 months.

Scoring

The scoring of the Pictorial Questionnaire was a numerical count of the independent choices made by the child. Throughout the booklet, the more dependent situations were designated by question-A, and the more independent situations were designated by question-B. The booklet provided the child with 24 choices, and therefore, the possible range of independence scores was from zero to 24.

Reliability

A split-half correlation, Spearman-Brown formula, was used to check the reliability of the pictorial questionnaire. Children's responses on the odd and even items were compared. The correlation yielded a coefficient of +0.681 which was significant at the .01 level. The Pictorial Questionnaire was accepted as having internal consistency.

Age and Sex Differences

The distribution of scores obtained on the Pictorial Questionnaire is presented by age and sex in Table III. The range of scores (06 - 24) indicates that the questionnaire did discriminate between dependent and independent children.

TABLE III

PICTORIAL QUESTIONNAIRE: DISTRIBUTION OF SUBJECTS BY AGE AND SEX (N = 48)

Age Group	Boys	Girls	Total
Five-year-olds (5:0 - 6:4)	8	15	23
Four-year-olds (4:0 - 4:11)	7	4	11
Three-year-olds (3:0 - 3:11)	6	8	14

The Kruskal-Wallis analysis of variance was used to analyze the data for age differences. The results indicated that there were no significant differences in the scores of the children in the three age groups. ($H = 4.218$; n.s.)

The Mann-Whitney U Test was used to analyze the data for sex differences. There were no significant differences in the scores of the boys and girls. ($U = 243.5$; $z = 0.831$; n.s.)

Subjects

The subjects for this research were 102 preschool children, 50 boys and 52 girls. The age range was from 2 years 11 months through 6 years 4 months. The children were in attendance at day care centers, nursery schools, and kindergartens. The distribution of subjects by sex and age is presented in Table IV. Of the 102 children, who participated in the study, 48 participated in the validity testing (Pictorial Questionnaire), and 74 participated in the independence study conducted by Patton, in which another research instrument was developed (Puzzle Box Independence Test).

The children used in the pilot work were not used in the study proper.

TABLE IV

PUZZLES INDEPENDENCE TEST: DISTRIBUTION OF SUBJECTS BY AGE AND SEX (N = 102)

Age Group	Boys	Girls	Total
Five-year-olds (5:0 - 6:4)	19	21	40
Four-year-olds (4:0 - 4:11)	16	15	31
Three-year-olds (2:11 - 3:10)	15	16	31

Recommended Analysis

The reliability and validity of the Puzzles Independence Test will be examined. A split-half correlation, Spearman-Brown formula, will be used to determine the internal consistency of the instrument. The validity will be studied by comparing the test independence scores with the results of the Pictorial Questionnaire designed to identify children's independent behavior in a variety of everyday situations. The Spearman rank order correlation and the Mann-Whitney U test will be used.

The Puzzles Test scores will be analyzed for age differences and sex differences. These scores include the independence score, the level of difficulty at which the child chose to work, and the amount of help that he accepted. The Mann-Whitney U test, the Kruskal-Wallis analysis of variance, and Chi-square will be used for these analyses.

The two independence tests will be compared, i.e., the Puzzles Test and the Puzzle Box Test. The Spearman rank order correlation will be used for this analysis.

CHAPTER IV

RESULTS

The purpose of this research was to develop an instrument which would measure the independent behavior of young children. The Puzzles Independence Test was developed and was administered to 102 preschool children. The test scores of these children were used in a study of the reliability and validity of the Puzzles Independence Test and were used in an analysis of age and sex differences in independence.

The Puzzles Independence Test was developed as part of a larger research project in which two possible instruments were being developed. Both of these instruments were administered to 74 preschool children, making possible a comparison of the two instruments. Descriptive data and test scores for individual children are presented in Appendix A, Table VIII and IX. A brief description of the other instrument, the Puzzle Box Independence Test, is presented in Appendix B.

Puzzles Independence Test

The Puzzles Independence Test was administered to 102 children, raning in age from 2 years 11 months through 6 years 4 months. Three scores from the independence test were available for each child: an independence score, a score indicating the level of difficulty at which the child chose to work, and a score indicating the amount of help the child accepted. The distribution of these scores by age and sex is

presented in Tables V, VI, and VII.

TABLE V

DISTRIBUTION OF INDEPENDENCE SCORES
(PUZZLES TEST)

Group	N	Median	Range
Five-year-olds	40	3.49	0.97 - 11.78
Boys	19	3.42	0.97 - 8.44
Girls	21	3.99	1.07 - 11.78
Four-year-olds	31	2.33	0.49 - 13.58
Boys	16	2.94	0.81 - 13.58
Girls	15	2.24	0.49 - 7.50
Three-year-olds	31	0.81	0.37 - 3.63
Boys	15	0.70	0.37 - 3.63
Girls	16	0.95	0.38 - 4.30
Total	102	2.33	0.37 - 13.58
Boys	50	2.33	0.37 - 13.58
Girls	52	1.88	0.38 - 11.78

Reliability

A split-half correlation, Spearman-Brown formula, was used to determine the internal consistency of the Puzzles Independence Test. The correlation coefficient was +0.77 ($p < .01$). The test was accepted as reliable.

TABLE VI

DISTRIBUTION OF SCORES INDICATING THE LEVEL OF DIFFICULTY AT WHICH EACH CHILD WORKED (PUZZLES TEST)

Group	N	Median	Range
Five-year-olds	40	1.58	1.14 - 2.27
Boys	19	1.56	1.14 - 2.27
Girls	21	1.60	1.19 - 1.98
Four-year-olds	31	1.67	1.10 - 2.93
Boys	16	1.68	1.22 - 2.93
Girls	15	1.50	1.10 - 2.48
Three-year-olds	31	1.51	1.02 - 2.86
Boys	15	1.43	1.05 - 2.33
Girls	16	1.63	1.02 - 2.86
Total	102	1.57	1.02 - 2.93
Boys	50	1.89	1.05 - 2.93
Girls	52	1.69	1.02 - 2.86

Validity

The Puzzles Independence Test is so designed that it has face validity. The puzzles offer the child a situation in which he is faced with a difficult task and has the option of working by himself or accepting help. In such a situation, a child who prefers to work by himself is behaviorally more independent than the child who accepts help. Nevertheless, the puzzles are simply one type of situation and may or may not reveal the independence that the child shows in his everyday activites.

TABLE VII

DISTRIBUTION OF SCORES INDICATING THE AMOUNT OF HELP EACH CHILD ACCEPTED (PUZZLES TEST)

Group	N	Median	Range
Five-year-olds	40	0.50	0.00 - 1.75
Boys	19	0.50	0.17 - 1.75
Girls	21	0.43	0.00 - 1.60
Four-year-olds	31	0.81	0.00 - 2.75
Boys	16	0.54	0.00 - 1.83
Girls	15	0.83	0.00 - 2.75
Three-year-olds	31	2.00	0.37 - 3.17
Boys	15	2.00	0.37 - 3.17
Girls	16	1.83	0.67 - 3.17
Total	102	0.83	0.00 - 3.17
Boys	50	0.76	0.00 - 3.17
Girls	52	0.91	0.00 - 3.17

In order to obtain a more general picture of instrumentally independent behavior, a Pictorial Questionnaire was developed and administered to 48 children. The validity of the Puzzles Independence Test was then studied by comparing the test's independence scores with the results of the Pictorial Questionnaire scores. A Spearman rank order correlation indicated no significant relationship between the independence test scores and the Pictorial Questionnaire scores (rho = 0.172; n.s.).

The Mann-Whitney U Test was also used to compare the 12 children

who were high-scoring and the 12 children who were low-scoring on the independence test. The results of this analysis indicated that there was no significant difference in the questionnaire responses of the children who were high-scoring and those who were low-scoring on the independence test ($U = 59.5$; n.s.).

Independence Scores

The independence scores obtained on the Puzzles Independence Test were analyzed for age and sex differences. The distribution of these scores is presented in Table V.

The Mann-Whitney U Test was used to analyze the independence scores for sex differences. This analysis indicated that there was no significant difference between the independence scores of boys and girls ($U = 1296$; $z = 0.19$; n.s.).

The Kruskal-Wallis analysis of variance was used to analyze the independence scores of age differences. The older children made significantly higher independence scores than did the younger children ($H = 37.6$; $p < .001$).

Level of Difficulty

The scores indicating the level of difficulty at which each child chose to work were analyzed for sex and age differences. The distribution of these scores is presented in Table VI.

The Mann-Whitney U Test was used to analyze the level of difficulty scores for sex differences. There was no significant difference between the level of difficulty scores of boys and girls ($U = 1236.5$; $z = 0.426$; n.s.).

The Kruskal-Wallis analysis of variance was used to analyze the level of difficulty scores for age differences. There were no significant age differences in the level of difficulty scores ($H = 0.95$; n.s.).

Amount of Help

The scores indicating the amount of help which the children accepted were analyzed for age and sex differences. The distribution of these scores is presented in Table VII.

Chi-square was used to analyze for age and sex differences. There was no significant difference in the amount of help accepted by boys and that accepted by girls ($\chi^2 = 0.37$; n.s.). Younger children accepted significantly more help than did the older children ($\chi^2 = 22.61$; $p < .001$).

Comparison of the two Independence Tests

The Puzzles Independence Test was developed as part of a larger research program in which two possible instruments were being developed. The other instrument was the Puzzle Box Independence Test, developed by Patton (1969). Both of these tests were administered to 74 children. Scores earned by these children on the two independence tests were highly correlated. The Spearman rank order correlation coefficient was +0.565 ($p < .001$).

For the Puzzles Independence Test, the children were grouped according to ability, and this grouping made a further comparison of the two tests possible. Spearman rank order correlation coefficients for the three ability groups indicated that significant relationships between the two tests existed for only the least skilled children, i.e.,

the children in Group III. The correlation coefficients were as follows: for Group I, rho = - 0.25; n.s.; for Group II, rho = - 0.10; n.s.; for Group III, rho = + 0.72; $p < .05$.

The comparison of the two independence tests by ability groups indicates that the least skilled children, who are the younger children, are primarily responsible for the high correlation that exists between the two tests.

Summary of Findings

The results of the statistical analyses can be summarized as follows:

1. The Puzzles Independence Test was internally consistent, i.e. was reliable. It was accepted as having face validity; but a comparison of the independence test with the Pictorial Questionnaire showed no relationship between these two types of independence scores.

2. There were no sex differences in the independence scores, the scores indicating the level of difficulty at which each child chose to work, or the scores indicating the amount of help each child accepted.

3. The older children were more independent than the younger children; and they accepted less help than did the younger children. However, there was no difference between the older and younger children in the level of difficulty at which they chose to work the puzzles.

4. The two independence tests, the Puzzles and the Puzzle Boxes, are comparable as indicated by a high correlation. The least skilled children, who are the younger children, earned similar scores on both tests. There is less similarity of test scores for the older and more skilled children.

CHAPTER V

SUMMARY AND IMPLICATIONS

The purpose of this research was to develop an instrument which would measure the independent behavior of young children. The Puzzles Independence Test was developed and was administered to 102 children, boys and girls, ranging in age from 2 years 11 months through 6 years 4 months. The children were in attendance at day care centers, nursery schools, and kindergartens. The test scores of these children were used in a study of the reliability and validity of the Puzzles Independence Test, and were used in an analysis of age and sex differences in independence.

The Puzzles Independence Test was designed so that it had face validity. The puzzles offered children a situation in which they were faced with a difficult task and had the option of working alone or accepting help. In such a situation, a child who preferred to work by himself was behaviorally more independent than a child who accepted help. Nevertheless, the puzzles were only one type of situation and may or may not have revealed the independence that a child showed in his everyday activities.

In order to obtain a more general picture of instrumentally independent behavior, a Pictorial Questionnaire was developed which gave the children choices between dependent and independent behavior in a variety of everyday situations. The Pictorial Questionnaire was administered to

48 of the children who participated in the study.

The development of the Puzzles Independence Test was part of a larger research project in which two instruments were being developed. Both of these instruments were administered to 74 of the children in this study, thus making possible a comparison and evaluation of the two independence tests. The results of the statistical analyses can be summarized as follows: (1) The Puzzles Independence Test was internally consistent, i.e., was reliable. It was accepted as having face validity; but a comparison of the independence test with the Pictorial Questionnaire showed no relationship between these two types of independence scores. (2) There were no sex differences in the independence scores, the scores indicating the level of difficulty at which each child chose to work, or the scores indicating the amount of help each child accepted. (3) The older children were more independent than the younger children; and they accepted less help than did the younger children. However, there was no difference between the older and younger children in the level of difficulty at which they chose to work the puzzles. (4) The two independence tests, the Puzzles and the Puzzle Boxes, were comparable as indicated by a high correlation. The least skilled children, who were the younger children, earned similar scores on both tests. There was less similarity of test scores for the older and more skilled children.

Evaluation of the two Independence Tests

The Puzzle Box Independence Test and the Puzzles Independence Test both met the criteria that had been established for measuring instrumental independent behavior in young children. Nevertheless, there was

evidence that the Puzzle Box Test was the better instrument of the two. Both instruments were statistically reliable and both were accepted as having face validity. However, when the independence scores were compared to the scores of the Pictorial Questionnaire, which was designed to identify independent behavior in everyday situations, only the validity of the Puzzle Box Independence Test was supported.

Both independence tests were designed to meet the criteria of appearing easy and yet being difficult but possible. The puzzles were adjusted for ability so that the more skillful children were offered a more difficult task than were the less skillful children; and no such adjustment was possible for the puzzle boxes. However, both instruments were scored in a way which provided an adjustment for ability, in that only the puzzles or boxes with which the children had difficulty were used in the scoring. In spite of these adjustments, nine of the children reached the ceiling of the Puzzles Independence Test, that is, they completed all of the puzzles without accepting any help; whereas, only one child reached the ceiling of the Puzzle Box Independence Test. One possible explanation for this difference between the two tests is that the puzzles were a familair task for the children and the puzzle boxes were novel. Also, the puzzles may not have been sufficiently difficult for the more skillful children even though an adjustment for ability was made in the pretest.

Implications for Future Research

The Puzzle Box Independence Test was developed for use in a battery of tests designed to measure characteristics related to creative ability. Several of these tests are now available and a study of the

relationships among these various characteristics should be initiated.

Prior to the inclusion of the puzzle boxes in creativity testing, an expanded study of independence should be undertaken in order to identify any refinements needed in the instrument. The Pictorial Questionnaire should also be refined and the validation study expanded.

A SELECTED BIBLIOGRAPHY

Baxter, Lenna Jane. "The Relationship of Independent Behavior to Creative Expression in Early Childhood." (unpub. M. S. thesis, Oklahoma State University, 1968).

Beller, Emanuel K. "Dependency and Independence in Young Children." The Journal of Genetic Psychology, LXXXVII (September, 1955), 25-35.

Clapp, William P. "Dependence and Competence in Children: Parental Treatment of Four-year-old Boys." (Microfilm of Ph.D. thesis, University of Colorado, 1966).

Crandall, Vaughn J., Anne Preston, and Alice Rabson. "Maternal Reactions and the Development of Independence and Achievement Behavior in Young Children." Child Development, XXXI (June, 1960), 243-251.

Erikson, Erik H. Childhood and Society. New York: W. W. Norton and Company, 1950.

Gewirtz, Jacob L. "Three Determinants of Attention-Seeking in Young Children." Monographs of the Society for Research in Child Development. XIX (1954), 5-48.

Hatfield, John S., Lucy Rau Ferguson, and Richard Alpert. "Mother-Child Interaction and the Socialization Process." Child Development, XXXVIII (1967), 365-414.

Heathers, Glen. "Acquiring Dependence and Independence: A Theoretical Orientation." The Journal of Genetic Psychology, LXXXVII (September, 1955), 277-291.

Heathers, Glen. "Emotional Dependence and Independence in Nursery School Play." The Journal of Genetic Psychology, CXXXVII (September, 1955), 37-57.

Keister, Mary Elizabeth and Ruth Updegraff. "A Study of Children's Reaction to Failure and an Experimental Attempt to Modify Them." Child Development, VII (1937), 241-248.

Marshall, Helen R. and Boyd R. McCandless. "Relationships Between Dependence on Adults and Social Acceptance by Peers." Child Development, XXVIII (December, 1957), 413-419.

Patton, June Lundy. "Independent Behavior of Young Children: The Relationship of Independence to Conforming Behavior." (unpub. M. S. thesis, Oklahoma State University, 1969).

Ross, Dorothea. "Relationship Between Dependency, Intentional Learning, and Incidental Learning in Preschool Children." Journal of Personality and Social Psychology, IV (1966), 374-381.

Sears, Robert R., Eleanor E. Maccoby, and Harry Levin. Patterns of Child Rearing. Evanston: Row, Peterson and Company, 1957.

Smith, Henrietta. "A Comparison of Interview and Observation Measures of Mother's Behavior." Journal of Abnormal and Social Psychology, LVII (1958), 278-282.

Starkweather, Elizabeth K. "Preschool Children's Willingness to try Difficult Tasks." Cooperative Research Project No. 5-0333, Office of Education, U. S. Department of Health, Education and Welfare, 1966.

Stendler, Celia Burns. "Possible Causes of Overdependency in Young Children." Child Development, XXV (June, 1954), 125-146.

Tether, Phyllis Higgins. "The Relationship Between Parental Attitudes and Conscientious Effort in First Grade Children." (unpub. M. S. thesis, Oklahoma State University, 1961).

Waring, Ethel B. Principles for Child Guidance. Cornell Extension Bulletin, New York State of Home Economics, 1939.

White, Sharon Kay. "A Study of Masculinity-Femininity and its Relation to Independent Behavior in Preschool Children." (unpub. M. S. thesis, Oklahoma State University, 1967).

APPENDIX A

TABLE VIII

DESCRIPTIVE DATA AND TEST SCORES FOR INDIVIDUAL BOYS WHO PARTICIPATED IN A STUDY OF THE INDEPENDENCE OF YOUNG CHILDREN (N = 50)

			Puzzles Test				Puzzle Box Test
Sex and Code No.	Age	Ability Group	Level of Difficulty	Level of Help	Independence Score	Validity Score	Independence Score
M-1633	6:4	III	2.248	0.666	3.38	22	1.88
M-1696	6:2	I	1.987	1.500	1.32		
M-1604	6:0	I	1.447	0.500	2.89	21	3.01
M-1341	6:0	I	1.401	0.166	8.44	18	3.38
M-1697	5:11	I	2.233	0.625	3.57		
M-1598	5:11	I	1.691	1.750	0.97		3.82
M-1546	5:11	I	1.500	0.200	7.50		
M-1610	5:10	II	1.660	1.142	1.45	22	4.45
M-1630	5:9	I	1.515	0.333	4.55	17	5.81
M-1700	5:7	I	1.329	0.200	6.65		
M-1625	5:7	I	1.405	1.166	1.20	14	1.58
M-1361	5:7	I	1.628	0.375	4.34	13	2.11
M-1716	5:7	I	1.563	0.333	4.69		
M-1624	5:7	I	1.853	0.857	2.16	20	3.62
M-1617	5:6	II	2.269	0.666	3.41		2.40
M-1562	5:5	I	1.594	0.571	2.79		4.22
M-1612	5:5	I	1.254	0.250	5.02		13.27
M-1566	5:4	I	1.470	0.333	4.41		
M-1518	5:1	I	1.139	0.333	3.42		
M-1394	4:11	I	1.942	0.000	13.58		31.12
M-1643	4:11	I	1.407	0.250	5.63	18	11.10
M-1644	4:11	I	1.312	0.500	2.62	13	0.66
M-1709	4:10	I	1.697	0.166	10.22		
M-1677	4:8	II	2.526	1.833	1.38		4.60
M-1390	4:8	II	1.670	1.333	1.26		0.78
M-1699	4:7	III	1.629	1.000	1.63		
M-1696	4:6	II	1.939	0.833	2.33		
M-1649	4:4	III	1.217	1.500	0.81		1.81
M-1650	4:4	I	1.424	0.833	1.71	14	2.20
M-1651	4:3	I	1.459	0.333	4.38	17	0.68
M-1704	4:3	II	1.848	0.571	3.24		
M-1658	4:2	II	2.928	0.500	5.86		1.53
M-1652	4:2	III	2.029	0.250	8.12	12	8.07
M-1653	4:1	II	2.008	0.000	6.03	09	1.20
M-1659	4:0	III	1.246	1.000	1.25	09	2.39
M-1530	3:11	II	1.452	0.400	3.63	17	0.68
M-1682	3:11	III	1.511	2.166	0.70		1.29
M-1703	3:9	III	1.416	1.600	0.89		
M-1537	3:9	III	1.412	2.166	0.66		
M-1711	3:8	III	1.602	2.000	0.80		
M-1544	3:8	III	1.434	1.250	1.15		0.68
M-1706	3:7	III	1.509	2.166	0.70		
M-1707	3:7	III	1.050	0.365	0.37		0.32
M-1712	3:7	II	1.850	1.428	1.30		
M-1705	3:6	III	2.326	0.857	2.71	11	1.55
M-1661	3:5	III	1.292	2.500	0.52	13	1.02
M-1662	3:4	III	1.260	2.857	0.44	09	0.49
M-1664	3:3	III	1.155	2.000	0.58	18	0.30
M-1714	3:1	III	1.072	2.000	0.54	06	0.67
M-1695	3:0	III	1.566	3.166	0.48		

TABLE IX

DESCRIPTIVE DATA AND TEST SCORES FOR INDIVIDUAL GIRLS WHO PARTICIPATED IN A STUDY OF THE INDEPENDENCE OF YOUNG CHILDREN (N = 52)

Sex and Code No.	Age	Ability Group	Puzzles Test: Level of Difficulty	Puzzles Test: Level of Help	Puzzles Test: Independence Score	Validity Score	Puzzle Box Test: Independence Score
F-1606	6:4	II	1.336	0.000	6.68	19	3.22
F-1635	6:2	I	1.223	0.000	4.89	17	3.45
F-1631	6:2	I	1.575	0.500	3.15	13	6.33
F-1609	6:1	I	1.707	1.600	1.07	17	2.05
F-1611	6:1	I	1.308	0.250	5.23	17	1.84
F-1627	6:0	I	1.706	0.428	3.99	21	2.80
F-1702	5:10	I	1.316	0.000	5.26		
F-1602	5:9	I	1.982	0.333	5.95	14	2.69
F-1601	5:9	I	1.710	1.285	1.33	06	1.99
F-1646	5:9	I	1.671	0.500	3.34	23	3.13
F-1622	5:9	I	1.664	1.333	1.25	14	3.50
F-1600	5:8	I	1.552	0.333	4.66	15	3.96
F-1618	5:8	I	1.641	0.333	4.93	15	2.05
F-1620	5:8	II	1.513	0.000	7.57	21	2.35
F-1603	5:7	I	1.452	0.833	1.74	13	3.65
F-1605	5:4	II	1.723	0.600	2.87	18	5.78
F-1690	5:3	III	1.192	1.000	1.19		0.39
F-1528	5:3	II	1.955	0.166	11.78		
F-1524	5:2	I	1.562	1.000	1.56		4.06
F-1538	5:1	II	1.599	1.200	1.33		
F-1529	5:0	II	1.781	0.400	4.45		
F-1556	4:10	I	2.426	2.250	1.08		1.24
F-1526	4:9	II	1.245	0.000	7.50		
F-1654	4:8	I	1.100	2.125	0.52	20	0.58
F-1647	4:8	I	1.501	0.000	6.00	14	1.97
F-1693	4:8	II	2.482	1.100	2.48		
F-1683	4:7	III	1.862	0.833	2.24		1.73
F-1684	4:6	II	1.672	0.500	3.34		2.73
F-1701	4:6	II	1.307	1.000	1.31		
F-0739	4:6	I	1.856	0.800	2.32	15	1.38
F-1685	4:5	II	1.295	0.250	5.18		5.07
F-1694	4:5	I	1.765	1.000	1.77		
F-1400	4:5	I	1.290	0.810	0.81		1.97
F-1397	4:4	I	1.248	0.000	6.24		0.85
F-1656	4:1	III	1.707	1.500	1.14	11	1.48
F-1657	4:0	III	1.341	2.750	0.49		0.83
F-1665	3:10	III	2.863	0.666	4.30	14	1.62
F-1713	3:9	III	1.366	0.819	0.82	17	0.63
F-1691	3:9	III	1.556	2.800	0.56		
F-1710	3:8	III	1.634	0.666	2.45	13	2.54
F-1666	3:8	II	1.749	1.500	1.17	14	1.50
F-1667	3:7	III	1.218	1.000	1.22	24	2.25
F-1572	3:7	III	2.116	0.750	2.82		3.53
F-1668	3:6	III	1.672	2.000	0.84	16	0.62
F-1686	3:6	III	1.601	2.000	0.80		0.85
F-1708	3:5	II	1.635	1.250	1.31	13	1.83
F-1688	3:4	III	1.255	2.666	0.47		0.90
F-1715	3:4	III	1.482	3.166	0.47		
F-1669	3:4	III	2.261	2.333	0.97	18	1.02
F-1692	3:3	III	2.662	1.333	2.00		
F-1687	3:2	III	1.024	2.666	0.38		0.81
F-1637	2:11	III	1.911	2.000	0.96		1.25

APPENDIX B

The Puzzle Box Independence Test

The Puzzle Box Independence Test, developed by Patton (1969), consists of ten puzzle boxes, two of which are used in demonstrating the boxes to the child. The remaining eight puzzle boxes constitute the test proper. The puzzle boxes are administered in a way that permits the child to behave in a dependent or independent manner.

The Puzzle Box Independence Test was developed as part of a larger research project in which the Puzzles Independence Test was developed. The administration and scoring are essentially the same for the two instruments. A sample score sheet, Figure 6, includes an illustration of the scoring of the Puzzle Box Independence Test.

SCORE SHEET - PUZZLE BOX INDEPENDENCE TEST

Name Child F-1657 Date 3/31/69

Birthdate 2-17-65 Age 4:1 School Lab II

Demonstration help I No. F-1657

2-piece I ? oh I

3-piece II ? oh I

4-piece I ? oh I ? oh II

5-piece I ? oh I ? oh I ? o IIII

5-piece III h I ? oh II

4-piece I ? oh ~~NN~~ II ? oh I

3-piece III h I

2-piece II

Puzzle Boxes	Attempts	Level of Difficulty	Help
2-piece	2	1.000	1
3-piece	3	1.000	1
4-piece	4	1.000	2
5-piece	7	1.400	2
5-piece	6	1.200	2
4-piece	9	2.250	2
3-piece	4	2.250	1
2-piece	2	1.333	0
		9.183	11

Mean Difficulty : 1.311
Mean Help : 1.571
INDEPENDENCE SCORE : 0.834

Figure 6. Method of Scoring the Puzzle Box Independence Test

APPENDIX C

PICTORIAL QUESTIONNAIRE

A Validation Instrument

Instrumental independence is frequently judged on the basis of whether a child performs daily tasks by himself, as opposed to being dependent upon an adult to perform the tasks for him. The Pictorial Questionnaire, designed as a validation instrument, consists of 24 paired pictures which give the child a choice between two situations, one dependent and the other independent. Directions for the administration and scoring of the questionnaire are presented on pages 31 and 32.

INDEPENDENCE VALIDITY TEST for BOYS

Name_____ Number_____

Birthdate_____ Age_____

Date_____

School_____

INDEPENDENCE VALIDITY TEST for GIRLS

Name_____ Number_____

Birthdate_____ Age_____

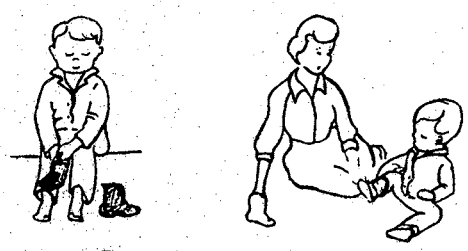
Date_____

School_____

1. It's time to go to breakfast, so let's put slippers on.

B. Do you put your slippers on?

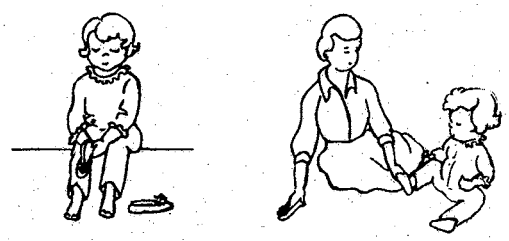
A. Does your mother put your slippers on?



1. It's time to go to breakfast, so let's put slippers on.

B. Do you put your slippers on?

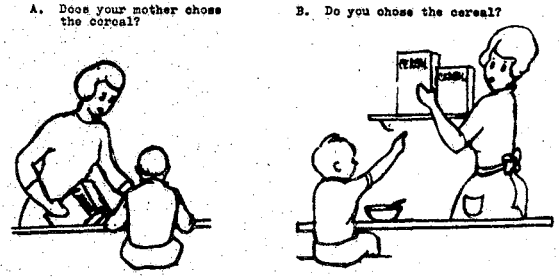
A. Does your mother put your slippers on?



2. We're going to have cereal for breakfast.

A. Does your mother chose the cereal?

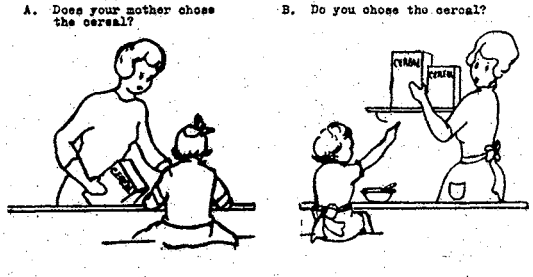
B. Do you chose the cereal?



2. We're going to have cereal for breakfast.

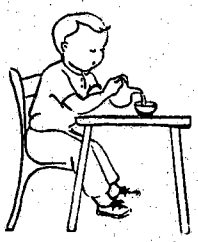
A. Does your mother chose the cereal?

B. Do you chose the cereal?

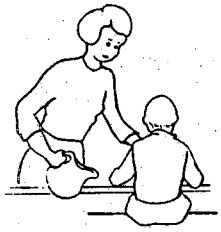


3. We need some milk on the cereal.

B. Do you pour the milk on the cereal?



A. Does your mother pour the milk on your cereal?



4. It's time to brush our teeth.

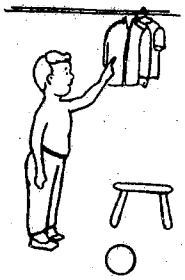
A. Does mother put the toothpaste on the toothbrush?

B. Do you put the toothpaste on the toothbrush?

5. It's almost time to go to school, so let's get our clothes on.

A. Does mother choose what you're going to wear?

B. Do you choose what you're going to wear?



6. Now to get dressed.

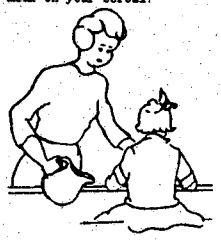
A. Does your mother help you get dressed?

B. Do you get dressed by yourself?

3. We need some milk on the cereal.

B. Do you pour the milk on the cereal?

A. Does your mother pour the milk on your cereal?



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A. Does mother put the toothpaste on the toothbrush?

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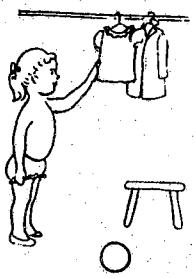
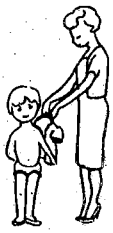


6. Now to get dressed.

A. Does your mother help you get dressed?



B. Do you get dressed by yourself?

7. Now for your socks.

B. Do you put on your socks?

A. Does your mother put on your socks?

8. We've got to comb our hair before we leave.

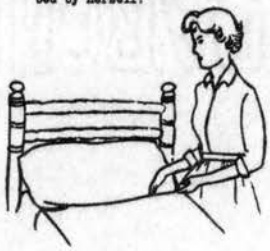
A. Does your mother comb your hair?

B. Do you comb your hair?

9. We'd better get the bed made before we leave.

B. Do you help your mother make the bed?

A. Does your mother make the bed by herself?



10. It's a little bit cool today, so let's wear our sweater.

B. Do you put your sweater on by yourself?

A. Does your mother help you put on your sweater?

7. Now for your socks.

B. Do you put on your socks?

A. Does your mother put on your socks?

8. We've got to comb our hair before we leave?

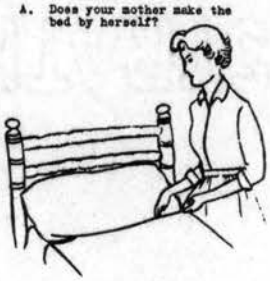
A. Does your mother comb your hair?

B. Do you comb your hair?

9. We'd better get the bed made before we leave.

B. Do you help your mother make the bed?

A. Does your mother make the bed by herself?



10. It's a little bit cool today, so let's wear our sweater.

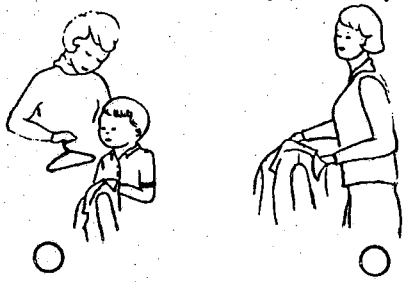
B. Do you put your sweater on by yourself?

A. Does your mother help you put on your sweater?

11. Now we've gone to school. We've been playing dress-up and now it's time to put the play clothes away.

B. Do you help put the play clothes away?

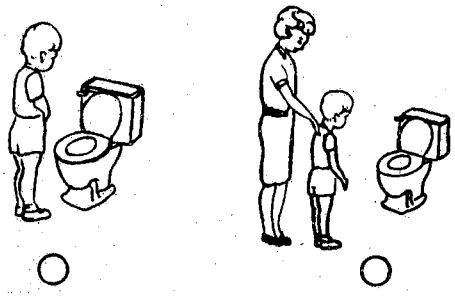
A. Does the teacher put the play clothes away?



12. Before snack, we better go to the bathroom.

B. Do you go to the bathroom by yourself?

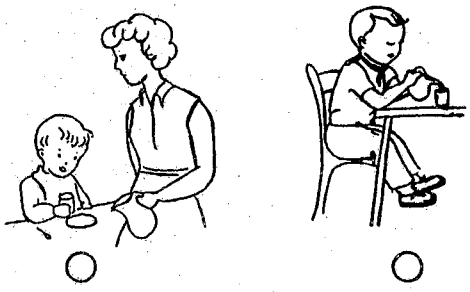
A. Does the teacher help you?



13. We need some juice.

A. Does the teacher pour the juice?

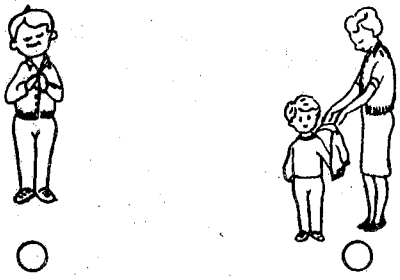
B. Do you pour the juice?



14. It's time to go outside and it's still chilly, so let's get our sweater.

B. Do you put your sweater on by yourself?

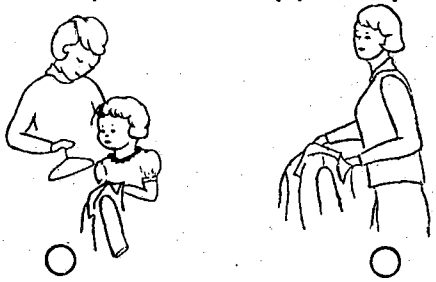
A. Does the teacher help you put your sweater on?



11. Now we've gone to school. We've been playing dress-up and now it's time to put the play clothes away.

B. Do you help put the play clothes away?

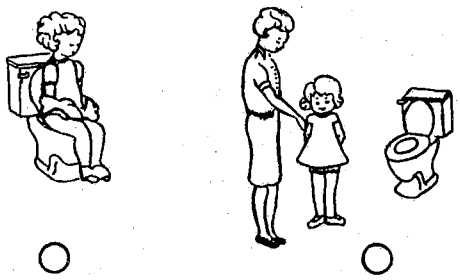
A. Does the teacher put the play clothes away?



12. Before snack, we better go to the bathroom.

B. Do you go to the bathroom by yourself?

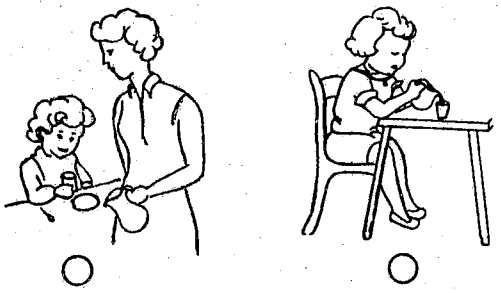
A. Does the teacher help you?



13. We need some juice.

A. Does the teacher pour the juice?

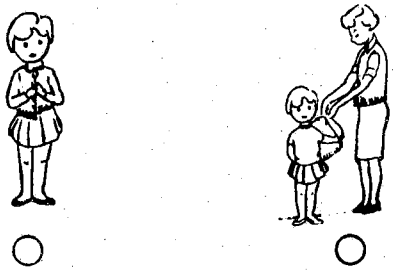
B. Do you pour the juice?



14. It's time to go outside and it's still chilly, so let's get our sweater.

B. Do you put your sweater on by yourself?

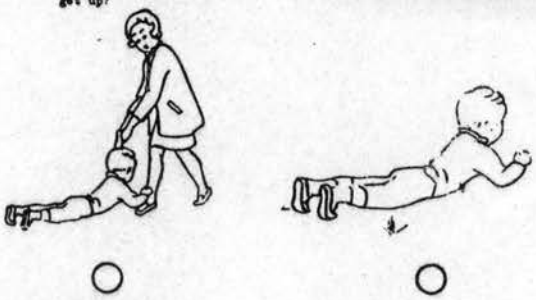
A. Does the teacher help you put your sweater on?



15. We hurry outside and trip and fall down.

A. Does the teacher help you get up?

B. Do you get up by yourself?



15. We hurry outside and trip and fall down.

A. Does the teacher help you get up?

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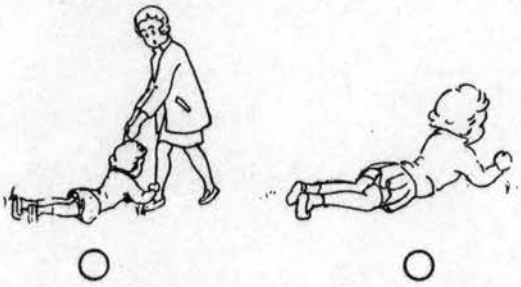
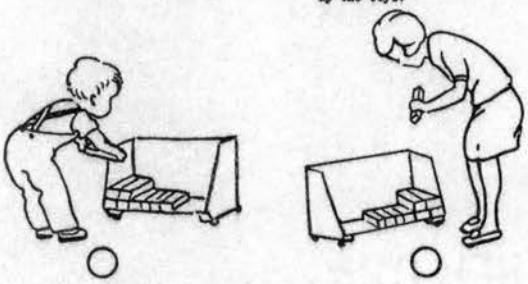


16. It's almost time to go home, so we need to pick up all the toys.

B. Do you pick up the toys?

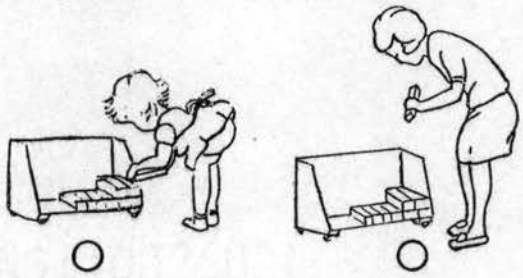
A. Does the teacher pick up the toys?



16. It's almost time to go home, so we need to pick up all the toys.

B. Do you pick up the toys?

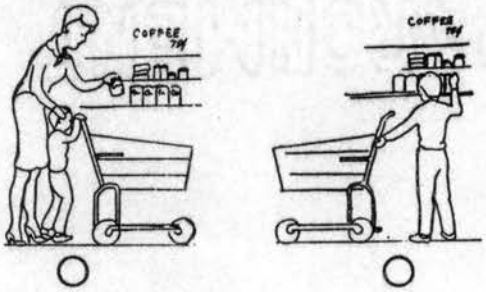
A. Does the teacher pick up the toys?



17. On the way home we go to the grocery store. We need coffee.

A. Does mother get the coffee?

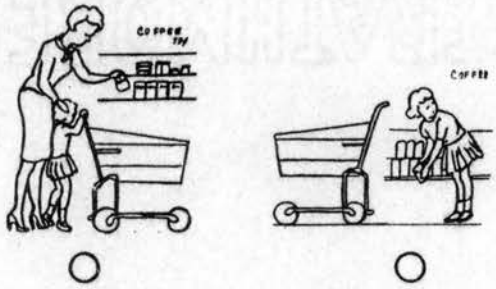
B. Do you get the coffee?



17. On the way home we go to the grocery store. We need coffee.

A. Does mother get the coffee?

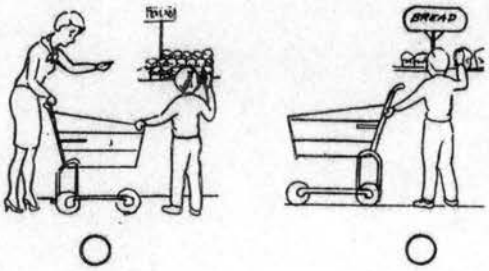
B. Do you get the coffee?



18. We need bread.

A. Does mother get the bread?

B. Do you get the bread?



18. We need bread.

A. Does mother get the bread?

B. Do you get the bread?

19. We need potatoes.

A. Does mother get the potatoes?

B. Do you get the potatoes?

20. When we get home, we need to take the groceries into the house.

A. Does mother carry all the groceries into the house?

B. Do you help carry the groceries into the house?

21. There is someone at the door with something and mother needs to pay him.

A. Does mother get her purse so she can pay him?

B. Do you get her purse?

22. We've had dinner and we've played awhile, and now it's time to take a bath.

A. Does mother help you undress?

B. Do you get undressed by yourself?

19. We need potatoes.

A. Does mother get the potatoes?

B. Do you get the potatoes?

20. When we get home, we need to take the groceries into the house.

A. Does mother carry all the groceries into the house?

B. Do you help carry the groceries into the house?

21. There is someone at the door with something and mother needs to pay him.

A. Does mother get her purse so she can pay him?

B. Do you get her purse?

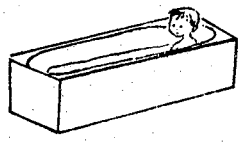
22. We've had dinner and we've played awhile, and now it's time to take a bath.

A. Does mother help you undress?

B. Do you get undressed by yourself?

23. Now into the tub.

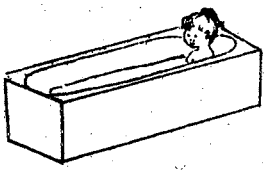
B. Do you take your bath by yourself?



A. Does mother help you take your bath?

23. Now into the tub.

B. Do you take your bath by yourself?



A. Does mother help you take your bath?

24. After our bath we get into our pajamas.

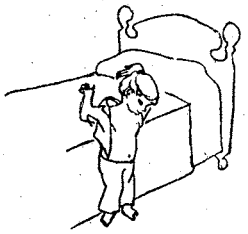
A. Does mother help you get into your pajamas?

B. Do you get into your pajamas by yourself?

24. After our bath we get into our pajamas.

A. Does mother help you get into your pajamas?

B. Do you get into your pajamas by yourself?



VITA

Helen Jean Smith

Candidate for the Degree of

Master of Science

Thesis: INDEPENDENT BEHAVIOR OF YOUNG CHILDREN: DEVELOPMENT OF A RESEARCH INSTRUMENT

Major Field: Family Relations and Child Development

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Education: Attended grade school in Nardin, Oklahoma; graduated from Blackwell High School, Blackwell, Oklahoma, in May, 1962. Received a Bachelor of Science degree from Oklahoma State University, Stillwater, Oklahoma, with a major in Family Relations and Child Development in the College of Home Economics, May, 1966. Completed requirements for the Master of Science degree in August, 1969.

Professional Experience: Assistant teacher, Presbyterian Kindergarten, Stillwater, Oklahoma, 1966-1967; Head Start teacher, Wynne, Arkansas, Summers, 1967 and 1968; Graduate Teaching Assistant, Department of Family Relations and Child Development, Oklahoma State University, 1968, 1969.

Professional Organizations: Phi Upsilon Omicron, American Home Economics Association, Southern Association on Children Under Six.