INDEPENDENT BEHAVIOR OF YOUNG CHILDREN: THE RELATIONSHIP OF INDEPENDENCE TO CONFORMING BEHAVIOR

By

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Bachelor of Science

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1966

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
MASTER OF SCIENCE
August, 1969

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THE RELATIONSHIP OF INDEPENDENCE

TO CONFORMING BEHAVIOR

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ACKNOWLEDGMENTS

The author wishes to express sincere gratitude to her adviser, Dr. Elizabeth Starkweather, for her interest and guidance. The author wishes to thank Dr. Nick Stinnett for his critical reading of the manuscript and suggestions. Special thanks is given to Mrs. Jeanie Smith for her assistance and cooperation throughout this study.

Appreciation is expressed to all the nursery school teachers, kindergarten teachers, and children for their cooperation while data were being collected.

Acknowledgment is given to the Oklahoma State University Research Foundation for their support of this research.

The author wishes to thank Miss Barbara Bremer for her steadfast encouragement throughout the years. Greatest appreciation is expressed to my husband, David, and our parents whose support and understanding have made the achievement of this goal a reality.

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CHAPTER I

INTRODUCTION

Purpose

The purpose of this research was to design an instrument which would measure the independent behavior of young children and to study the relationship of independence to conforming behavior. The Puzzle Box Independence Test was developed as part of a larger research project in which two possible instruments were being developed, validated, and compared. A comparison of the two instruments is included in this study. The Puzzle Box Independence Test was also used in a study of independence and conforming behavior. This comparison was made in order to determine whether the independence test was measuring a unique quality of the child, or whether it was merely measuring the freedom which is necessary for a child to be independent and for a child to be freely conforming and nonconforming.

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 relationships 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, age and conformity 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. Jeanie Smith, whose thesis research was coordinated with the research reported in this study.

2. A research instrument, the Puzzle Box Independence Text, was developed.

3. The Puzzle Box Independence Test was administered to 116 boys and girls ranging in age 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 Puzzles Independence Test developed by Smith (1969), was administered to 74 of the children; and a test of conformity-nonconformity was administered to 38 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 Smith.

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 or adult-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 overdependency 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 practices with specific reference to feeding, weaning, and toilet training. Stendler found evidence that overdependency can result from maternal overprotection. 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 designed 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 achieving 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 obvious 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 Puzzle Box Independence Test, its administration and scoring; (3) a description of the Conformity-Nonconformity Test and its scoring; (4) a description of the subjects who participated in the research; and (5) recommendations for the analysis of the data.

Development of the Independence Test

The criteria for the development of the independence test included (1) that the task be of interest to young children, (2) that it appear easy and yet be difficult but possible, (3) that it provide opportunity for help to be offered to the child, (4) that it provide the child with experiences of success, and (5) that it be objectively scored.

Baxter (1968) measured independence using puzzle boxes adapted from Keister (1937). Her instrument met all of the above criteria except that the child did not necessarily experience success after he was offered help, and therefore, he had no way of knowing that he had actually received genuine help. In an attempt to overcome this problem, inlay formboards were constructed as a possible instrument. With this instrument the child experienced success whenever he placed a piece correctly. Examples of these formboards are presented in

Figure 1. These simple formboards were used with approximately 16 children. They proved to be too easy, few children needed help, and so this type of instrument was abandoned.

To solve the problems that were apparent at this stage of the pilot work, a set of small puzzle boxes were designed. These were similar to the large puzzle boxes used by Baxter (1968). The puzzle boxes, illustrated in Figure 2, were approximately four inches by five and one-half inches in size. The pieces were painted on one side so that the upright side could be easily identified by the child.

Several ways of administering the puzzle boxes were explored. Some children were permitted to choose one puzzle box at a time until they had completed all the boxes. When this method of administration was used, the order of the boxes was different for each child. For other children the boxes were presented in order, beginning with the two-piece boxes and ending with the five-piece boxes. During this stage of the pilot work, the children's ways of asking for help were noted and the possible ways of offering help were explored. From this exploratory work the order of presentation and the manner of offering help was determined.

An order of presentation was chosen which gave each child an initial demonstration with a puzzle box before he began the test proper. The sequence of presentation of the puzzle boxes for the actual test was an order which made it possible for the child to start with a box with which he would experience quick success and to end with a box with which he would again experience quick success. For the first four puzzle boxes the difficulty for the child gradually increased, and for the last four puzzle boxes it gradually decreased.

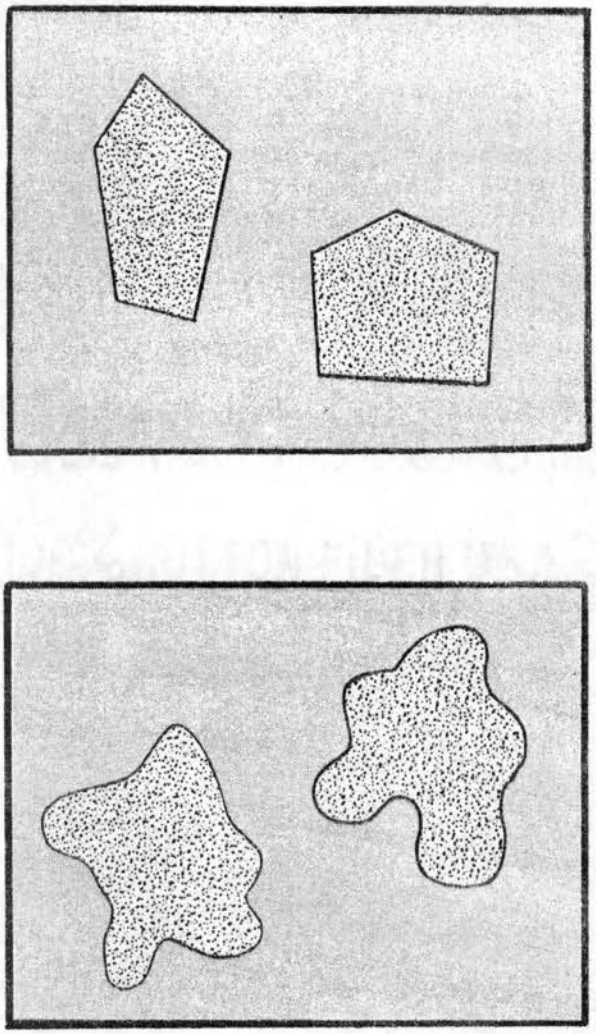

Figure 1. Pilot Study Formboards

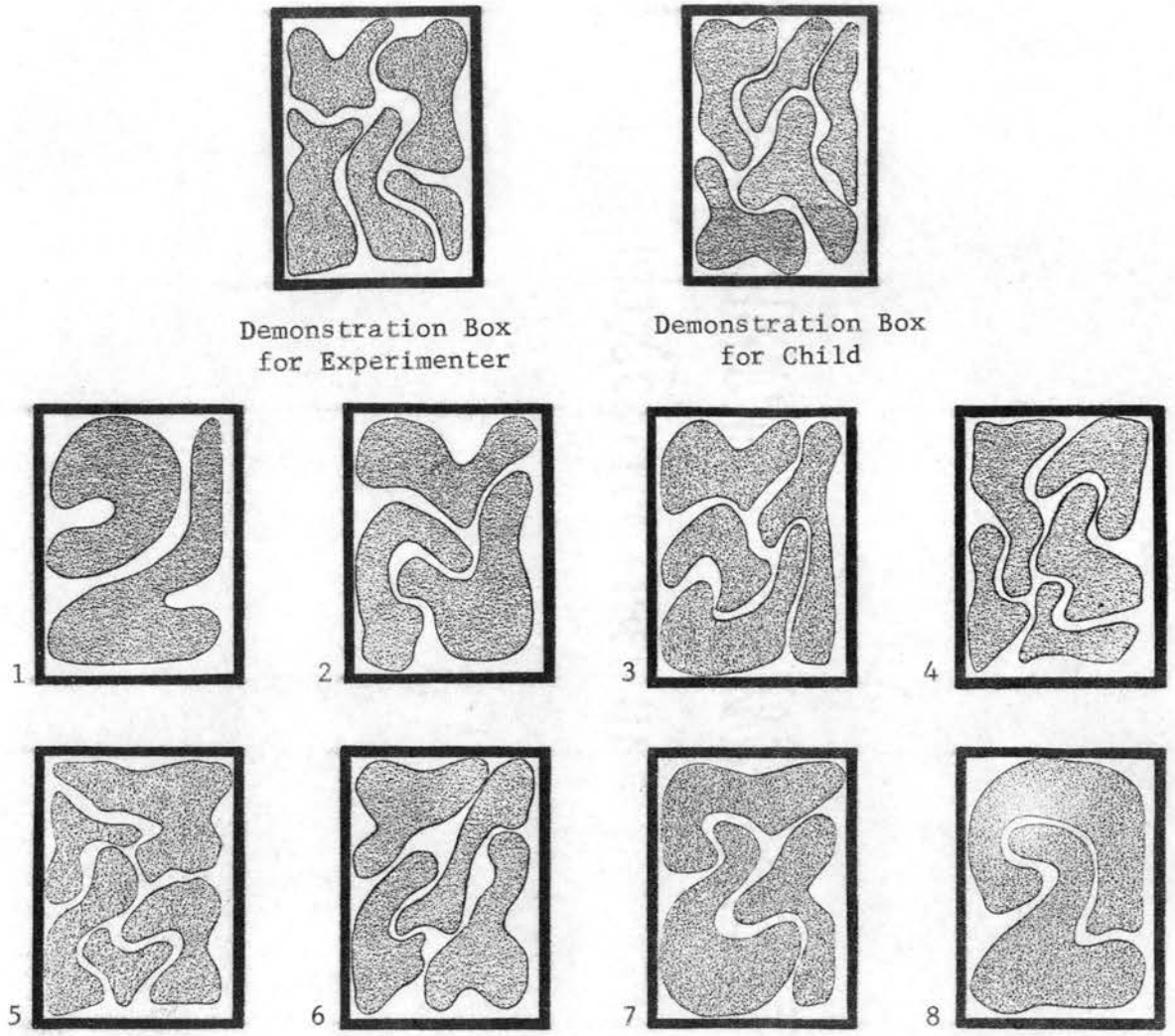

Figure 2. Puzzle Box Independence Test - Order of Presentation

(For the first four puzzle boxes the number of pieces in each box was two, three, four, and five pieces in that order. For the last four puzzle boxes the number of pieces was five, four, three, and two pieces in that order.)

In the puzzle box test, a child's independence should be indicated by the relationship between the difficulty of the task for him and the amount of help he accepted in completing the task. For each puzzle box, independence could be specifically measured in terms of the number of pieces the child picked up to put into the box and the number of times that he accepted help in completing the puzzle box. This method of measuring independence demanded that the ways of offering help to the child be clearly defined.

Some children specifically asked for help, and when this occurred, offering help was no problem. Other children were reluctant to ask for help or possibly were unable to do so. Because of this problem, an arbitrary decision was made to offer help after the child had made ten attempts to complete the puzzle box.

Another problem was related to the way the children requested help. Frequently a child would comment about a puzzle being hard; or, referring to a piece he was holding, he would ask, "Where does this go?" These comments and questions did not necessarily mean that the child wanted help; and therefore, when any child made a comment which seemed to imply that he wanted help, the experimenter responded with the question, "Do you want me to help?" Only when the child specifically indicated that he wanted help was help given.

Puzzle Box Independence Test

The Puzzle Box Independence Test 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 boxes and puzzle pieces are made of one-half inch plywood. The top surface of the puzzle pieces is painted in order that the upright side may be easily identified. The ten puzzle boxes are presented in Figure 2. The administration and scoring of the test, as it was used in the present study, is described below.

Administration

Two of the five-piece puzzle boxes were used to introduce the child to the task. The experimenter placed one box before the child and one before herself. Then, in the following manner, she told the child to remove the pieces from the box and to replace them. "Look, there is a puzzle box for you and one for me. Let's dump the pieces out." This was done by turning the puzzle box completely over so that the pieces were on the table with the colored sides down. "Now turn up the colored sides." The experimenter then turned her pieces over so that the colored sides showed and the child did the same with his. "Now you try to get all your pieces back inside your box and I'll try to get mine back into my box." The experimenter then slowly put her puzzle pieces back into the box, using only one hand, in order not to obstruct the child's view of what she was doing, and working in such a way that she made several attempts before completing the box correctly. As they worked the demonstration puzzle boxes, the experimenter told the child, "I'll help you if you need me to."

Following the demonstration, the eight puzzle boxes which make up the test proper were presented to the child in a predetermined order. The order was such that the child began and ended with an easy puzzle box which assured him of success. The order of presentation of the puzzle boxes was such that for the first four puzzle boxes the difficulty for the child gradually increased, and for the last four puzzle boxes the difficulty gradually decreased. The number of puzzle pieces in each box was two, three, four, five, and then five, four, three, and two, in that order.

As each box was presented to the child, he was instructed to dump the pieces out and then turn them so that the colored side would be up. Then while working each box, he was offered help at regular intervals whether or not he asked for help. The experimenter counted each piece that the child picked up to put into the box, and after ten pieces had been picked up, she asked, "Would you like some help?" If the child asked for help or accepted help in working the puzzle box, the experimenter put one piece into the box correctly and removed any incorrectly placed pieces. The experimenter also offered to help at any time that the child's behavior indicated that he might want help. For example, if a child made a comment, such as, "Where does this one go?" or if he stared expectantly at the experimenter, she asked specifically whether he wanted help. At such times help was given only if the child clearly indicated that he wanted help. Many of the children refused help when it was offered even though they had specifically asked where a certain piece could go.

Scoring

The scoring of the Puzzle Box Independence Test took into consideration (a) the number of pieces in the puzzle box, (b) the number of pieces the child picked up to put into the box, and (c) 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. Independence 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 of Child M-1624 is presented in Figure 3, and is used to illustrate the method of scoring. The vertical marks indicate the number of attempts the child made in completing each puzzle box. For example, Child M-1624 made 11 attempts in completing the first 3-piece puzzle box and made 45 attempts in completing the first 4-piece puzzle box. Each "o" indicates a point at which the experimenter offered to help the child, each "?" signifies a point at which the child's behavior indicated that he might want help, and each "h" shows that the child accepted help at that point. In the illustration, Child M-1624 was offered help (o) after making ten attempts to complete the first 3-piece puzzle box, and he accepted help (h) at that time. Then with one more attempt, he completed that puzzle box. When he was working on the first 4-piece puzzle box, after nine attempts his behavior (?) indicated that he might want help, and the experimenter offered help (o) at that time, but he refused it. In completing that particular puzzle box, the child made a total of 45 attempts, was offered help five times, and accepted help twice.

SCORE SHEET - PUZZLE BOX INDEPENDENCE TEST

Name Child M-1624 Date 2/25/69

Birthdate 7/10/63 Age 5:7 School Kollins

Demonstration help III No. M-1624

2-piece II

3-piece IIII IIII oh I

4-piece IIII IIII ?o IIII IIII oIIII IIII oh IIII IIII o IIII ?oh I

5-piece IIII IIII oh IIII IIII oh IIII I

5-piece III ?oh IIII

4-piece IIII IIII I oh IIII

3-piece IIII IIII oh I

2-piece II

Puzzle Boxes	Attempts	Level of Difficulty	Help
2-piece	2		0
3-piece	11	3.666	1
4-piece	45	11.250	2
5-piece	26	5.200	2
5-piece	7	1.400	1
4-piece	15	3.750	1
3-piece	11	3.666	1
2-piece	2		0
		28.932	8

Mean Difficulty : 4.822
Mean Help : 1.333
INDEPENDENCE SCORE : 3.617

Figure 3. Method of Scoring the Puzzle Box Independence Test

The scoring of the Puzzle Box Test takes into consideration all of the puzzle boxes with which the child had some difficulty. These would be the puzzle boxes for which the child accepted help and the puzzle boxes for which his attempts exceeded the number of pieces in the box. For Child M-1624, these included all of the puzzle boxes except those with only two pieces.

The steps involved in figuring the Independence Score are as follows:

1. The level of difficulty at which the child chose to work each puzzle box is figured by dividing the number of attempts by the number of pieces in the box. For Child M-1624, the level of difficulty for the first 3-piece puzzle box was 11 ÷ 3, or 3.666.
2. The mean level of difficulty is figured by summing the levels of difficulty and dividing this figure by the number of puzzle boxes with which the child had difficulty. For Child M-1624, the sum is 28.932. This sum divided by 6 yields a mean level of difficulty of 4.822.
3. The mean amount of help is then figured by dividing the number of times the child accepted help by the number of puzzle boxes with which he had difficulty. For Child M-1624, help was given eight times during the six puzzle boxes with which he had difficulty. The mean level of help for this child is 8 ÷ 6, or 1.333.
4. The Independence Score is then figured by dividing the mean level of difficulty by the mean level of help. For Child M-1624, this is 4.822 ÷ 1.333, or 3.617.

Conformity-Nonconformity Test

A research instrument, developed by Starkweather (1964), was used to measure conforming and nonconforming behavior in an impersonal situation. The pictures on the form boards are of a tree, a house, a playground, and a barnyard. Each form board has five holes, and for each hole there are four different pieces which could be used in completing the picture. The picture pieces for the form boards are paired and the child chooses one of each pair. Each child plays with the form boards twice, with approximately a one-week interval between the two sessions.

The opportunity to conform is provided by a line drawing placed behind the form board. In the Tree Form Board, as illustrated in Figure 4, a line drawing of a rabbit is shown at the base of the tree; and to complete this part of the picture, the child chooses between a rabbit and flowers. Approximately one week later, during the second session with the form boards, the child again chooses between the rabbit and the flowers, but this time the line drawing is of the flowers. The underlying assumption is that the child who really prefers the rabbit will choose the rabbit during both sessions if he is free to use conforming and nonconforming behavior; however, the child who is a conformist will choose the rabbit only when the line drawing of the rabbit is shown, and the nonconformist will choose the rabbit only when the line drawing of the flowers is shown.

Scoring

The scoring consists of a simple numerical count of the conforming and nonconforming responses. A D-score, or difference score, is then calculated by subtracting the number of nonconforming responses from

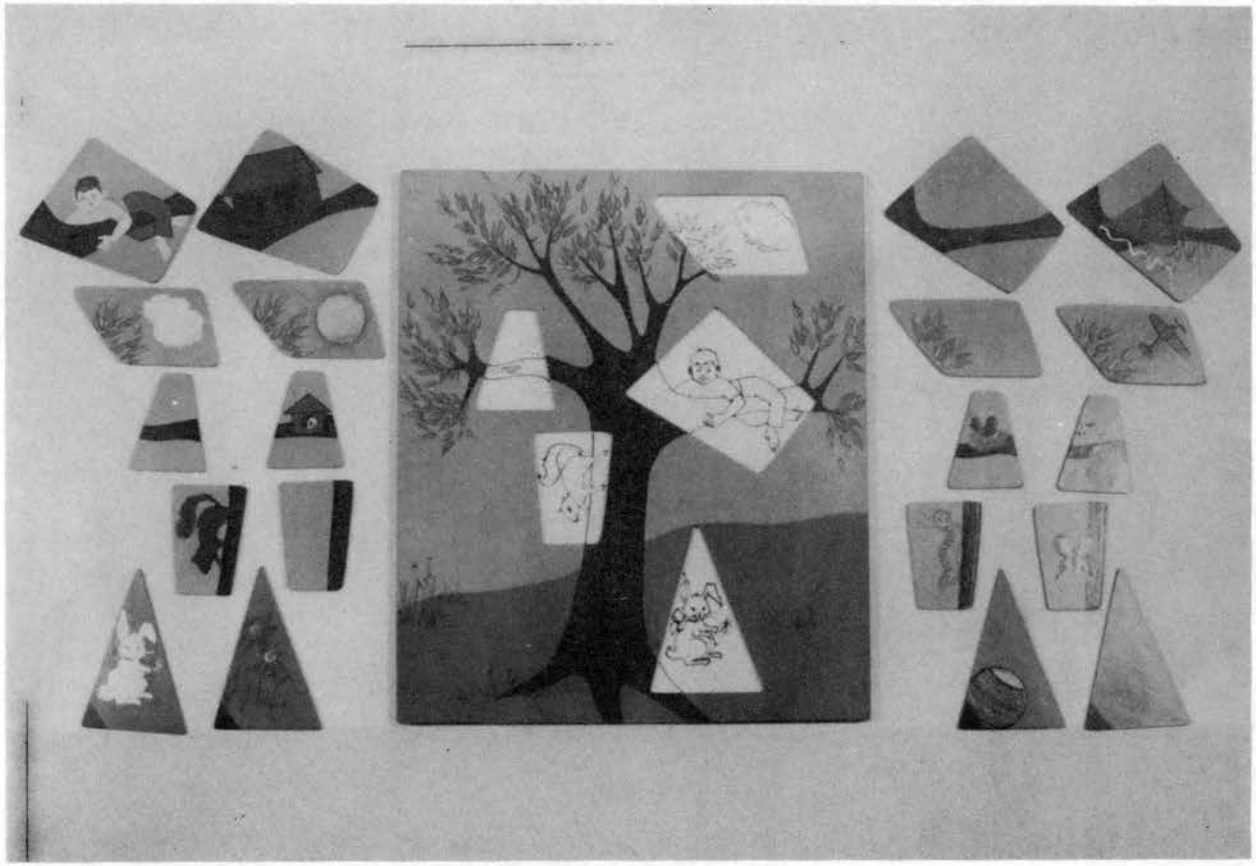

Figure 4. Conformity-Nonconformity Test - The Tree Form Board

the number of conforming responses. The possible range of D-scores is from +80 (complete conformity) to -80 (complete nonconformity).

Subjects

The subjects who participated in this study were 116 preschool children, 63 girls and 53 boys. The age range of the children was from two years ten months to six years four months. The children were in attendance at day care centers, nursery schools, and kindergartens. The distribution of the subjects by sex and age is presented in Table I. Of these children, 48 were used in the validity testing, 38 were used in the comparison of independence and conformity, and 74 were used in the comparison of the two independence tests (the Puzzle Box Independence Test developed in the present study and the Puzzles Independence Test developed by Smith, 1969).

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

Recommended Analysis

The reliability and validity of the Puzzle Box 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 a 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.

TABLE I

PUZZLE BOX INDEPENDENCE TEST: DISTRIBUTION OF SUBJECTS BY AGE AND SEX

(N=116)

Age Group	Boys	Girls	Total
Five-year-olds (5:0 - 6:4)	19	24	43
Four-year-olds (4:0 - 4:11)	18	22	40
Three-year-olds (2:10 - 3:11)	16	17	33

The Puzzle Box Test scores will be analyzed for age differences and sex differences. These scores include the independence score, a score indicating the level of difficulty at which the child chose to work, and a score indicating 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 relationship between independence and conformity-nonconformity will be examined. The Spearman rank order correlation and the Mann-Whitney U test will be used for this analysis.

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

CHAPTER IV

RESULTS

The purpose of this research was to design an instrument which would measure the independent behavior of young children and to study the relationship of independence to conforming behavior. The Puzzle Box Independence Test was developed and was administered to 116 preschool children. The test scores of these children were used in a study of the reliability and validity of the Puzzle Box Test and were used in an analysis of age and sex differences in independence. A test of conforming and nonconforming behavior was administered to 38 of the children; and the scores for both tests were then analyzed for a possible relationship between independence and conformity-nonconformity.

The Puzzle Box Independence Test was developed as part of a larger research project in which two possible instruments were being developed. The two 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 V and VI. A brief description of the other instrument, the Puzzles Independence Test, is presented in Appendix B.

Puzzle Box Independence Test

The Puzzle Box Independence Test was administered to 116 children, ranging in age from two years ten months through six years four 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 II, III, and IV.

Reliability

A split-half correlation, Spearman-Brown formula, was used to determine the internal consistency of the Puzzle Box Independence Test. The correlation coefficient was +0.70 ($p < .01$). The test was accepted as reliable.

Validity

The Puzzle Box Independence Test is so designed that it has face validity. The puzzle boxes 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 puzzle boxes are simply one type of situation and may or may not reveal the independence that the child shows in his everyday activities.

In order to obtain a more general picture of instrumentally independent behavior, a pictorial questionnaire, which offered children choices between dependent and independent situations in everyday activities, was administered to 48 children as a validation test. The Pictorial Questionnaire was developed as a part of the larger research project and is reported in Smith (1969). The validity of the

Puzzle Box Independence Test was then studied by comparing the test's independence scores with the results of the Pictorial Questionnaire.

A Spearman rank order correlation indicated no significant relationship between the independence test scores and the Pictorial Questionnaire scores (rho = +0.203; n.s.).

A Mann-Whitney U test was also used to compare the 15 children who were high-scoring and the 15 children who were low-scoring on the independence test. The results of this analysis indicated that the children who were high scoring on the independence test scored significantly higher on the questionnaire than did the children who were low scoring on the independence test ($U = 63.5$; $p < .05$).

Independence Scores

The independence scores obtained in the Puzzle Box Independence Test were analyzed for age and sex differences. The distribution of these scores is presented in Table II.

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 ($U = 1720.5$; $z = 0.282$; n.s.).

The Kruskal-Wallis analysis of variance was used to analyze the independence scores for age differences. The older children made significantly higher independence scores than did the younger children ($H = 29.2$; $p < .001$).

Level of Difficulty

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

The Mann-Whitney U test was used to analyze the level of difficulty scores for sex differences. Boys chose to work the puzzle boxes at a significantly more difficult level than did the girls ($U = 3044.5$; $z = 2.39$; $p < .01$).

The Kruskal-Wallis analysis of variance was used to analyze the level of difficulty scores for age differences. The older children chose to work the puzzle boxes at a significantly more difficult level than did the younger children ($H = 23.91$; $p < .001$).

Amount of Help

The scores indicating the amount of help which the children accepted were analyzed for age and sex differences. Chi-square was used for these analyses. The distribution of these scores is presented in Table IV.

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 ($\chi^2 = 0.26$; n.s.). Younger children accepted significantly more help than did the older children ($\chi^2 = 25.28$; $p < .001$).

TABLE II

DISTRIBUTION OF INDEPENDENCE SCORES

(PUZZLE BOX TEST)

Group	N	Median	Range
Five-year-olds	43	3.01	0.39 - 31.12
Boys	19	3.38	0.48 - 31.12
Girls	24	2.88	0.39 - 06.33
Four-year-olds	40	1.89	0.58 - 23.83
Boys	18	1.91	0.66 - 11.10
Girls	22	1.85	0.58 - 23.83
Three-year-olds	33	1.02	0.30 - 04.15
Boys	16	1.00	0.30 - 04.15
Girls	17	1.20	0.32 - 03.53
Total	116	1.96	0.30 - 31.12
Boys	53	1.88	0.30 - 31.12
Girls	63	1.97	0.32 - 23.83

TABLE III

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

Group	N	Median	Range
Five-year-olds	43	2.79	1.03 - 04.82
Boys	19	2.79	1.14 - 04.82
Girls	24	2.78	1.03 - 04.02
Four-year-olds	40	2.32	1.18 - 14.89
Boys	18	2.24	1.18 - 14.89
Girls	22	2.45	1.29 - 04.41
Three-year-olds	33	1.70	1.00 - 03.91
Boys	16	1.52	1.03 - 03.91
Girls	17	1.86	1.00 - 03.52
Total	116	2.32	1.00 - 14.89
Boys	53	2.64	1.03 - 14.89
Girls	63	2.35	1.00 - 04.41

TABLE IV

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

Group	N	Median	Range
Five-year-olds	43	1.00	0.00 - 3.29
Boys	19	1.20	0.00 - 2.40
Girls	24	1.00	0.40 - 3.29
Four-year-olds	40	1.31	0.13 - 2.20
Boys	18	1.24	0.50 - 2.17
Girls	22	1.42	0.13 - 2.20
Three-year-olds	33	1.88	0.50 - 3.67
Boys	16	1.85	0.50 - 3.67
Girls	17	2.00	0.86 - 3.14
Total	116	1.33	0.00 - 3.67
Boys	53	1.38	0.00 - 3.67
Girls	63	1.29	0.13 - 3.29

Independence and Conformity-Nonconformity

The Puzzle Box Independence Test and the Conformity-Nonconformity Test were used in a study of independence and conforming behavior. Thirty-eight children participated in this part of the study. The comparison of independence and conforming behavior was made in order to determine whether the independence test was measuring a unique quality of the child, or whether it was merely measuring the freedom which is necessary for a child to be independent and is also necessary for a child to be conforming and nonconforming.

A Spearman rank order correlation of the scores from the two tests indicated that there was no significant relationship between the two (rho = +0.06; n.s.). A Mann-Whitney U test analysis indicated that there was no significant difference between the conformity scores of the children who scored high and low on the independence test. Ten high-scoring and ten low-scoring children were included in this analysis (U = 42.5; n.s.).

These findings indicate that the independence test and the conformity-nonconformity test do measure separate qualities.

Comparison of the Two Independence Tests

The Puzzle Box Independence Test was developed as part of a larger research project in which two possible instruments were being developed. The other instrument was the Puzzles Independence Test, developed by Smith (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 a significant relationship 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 Puzzle Box Independence Test was internally consistent, i.e., was reliable. It was accepted as having face validity; and when the scores were compared to those of a pictorial questionnaire, designed to identify independent behavior in everyday situations, the validity of the Puzzle Box Independence Test was supported.
2. There were no sex differences in the independence scores or in the scores indicating the amount of help that each child accepted. However, boys chose to work the puzzle boxes at a significantly more difficult level than did the girls.
3. The older children were more independent than the younger children; they chose to work the puzzle boxes at a more difficult level than

did the younger children; and they accepted less help than did the younger children.

4. There was no significant relationship between the Puzzle Box Independence Test and the Conformity-Nonconformity Test. The Puzzle Box Independence Test is measuring a unique quality of the child, and is not merely measuring the freedom which is necessary for a child to be independent and which is also necessary for a child to be freely conforming and nonconforming.
5. The two independence tests, the puzzle boxes and the puzzles, 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 in the scores of older and more skilled children.

CHAPTER V

SUMMARY AND IMPLICATIONS

The purpose of this research was to design an instrument which would measure the independent behavior of young children and to study the relationship of independence to conforming behavior. The Puzzle Box Independence Test was developed and was administered to 116 children, boys and girls, ranging in age from two years ten months through six years four 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 Puzzle Box Test and were used in an analysis of age and sex differences in independence. A test of conforming and nonconforming behavior was administered to 38 of the children; and scores of both tests were then analyzed for a possible relationship between independence and conformity-nonconformity. The Puzzle Box Independence Test was developed as part of a larger research project in which two possible instruments were developed. The two instruments were administered to 74 of the children, thus making possible a comparison and evaluation of both independence tests.

The Puzzle Box Independence Test was designed so that it had face validity. The puzzle boxes offered the 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 puzzle boxes were only one type of situation and may or may not have revealed the independence that a child might show in his everyday activities. In order to obtain a more general picture of instrumentally independent behavior, a pictorial questionnaire, which offered children choices between dependent and independent situations in everyday activities, was administered to 48 children; and the validity of the Puzzle Box Independence Test was then studied by comparing the independence scores with the results of the Pictorial Questionnaire.

The results of the statistical analyses can be summarized as follows: (1) The Puzzle Box Independence Test was internally consistent, i.e., was reliable. It was accepted as having face validity; and when the scores were compared to those of a pictorial questionnaire, designed to identify independent behavior in everyday situations, the validity of the Puzzle Box Independence Test was supported. (2) There were no sex differences in the independence scores or in the scores indicating the amount of help that each child accepted. However, boys chose to work the puzzle boxes at a significantly more difficult level than did the girls. (3) The older children were more independent than the younger children; they chose to work the puzzle boxes at a more difficult level than did the younger children; and they accepted less help than did the younger children. (4) There was no significant relationship between the Puzzle Box Independence Test and the Conformity-Nonconformity Test. The Puzzle Box Independence Test is measuring a unique quality of the child, and is not merely measuring the freedom which is necessary for a child to be independent and which

is also necessary for a child to be freely conforming and nonconforming. (5) The two independence tests, the puzzle boxes and the puzzles, 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 in the scores of 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 the 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 familiar 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.

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APPENDIX A

TABLE V

DESCRIPTIVE DATA AND TEST SCORES FOR INDIVIDUAL BOYS WHO PARTICIPATED IN A STUDY OF THE INDEPENDENCE OF YOUNG CHILDREN

(N = 53)

Sex and Code No.	Age	Puzzle Box Test: Level of Difficulty	Puzzle Box Test: Level of Help	Puzzle Box Test: Independence Score	Validity Score	Puzzles Test: Ability Group	Puzzles Test: Independence Score	Conformity-Nonconformity D-Score
M-1633	6:4	2.633	1.400	1.88	22	III	3.38	
M-1597	6:3	4.279	1.250	3.42				
M-1614	6:0	3.329	1.400	2.38				
M-1341	5:11	3.377	1.000	3.38	18	I	8.44	
M-1604	5:11	4.209	1.400	3.01	21	I	2.89	
M-1598	5:11	1.908	0.500	3.82		I	0.97	
M-1610	5:10	2.542	0.571	4.45	22	II	1.46	
M-1599	5:9	3.677	1.000	3.68				
M-1630	5:8	3.318	0.571	5.81	17	I	4.55	
M-1625	5:7	2.210	1.400	1.58	14	I	1.20	
M-1624	5:7	4.822	1.333	3.62	20	I	2.16	
M-1629	5:7	1.586	0.666	2.38				
M-1361	5:6	2.526	1.200	2.11	13	I	4.34	
M-1617	5:6	2.883	1.200	2.40		II	3.41	
M-1562	5:6	2.529	0.600	4.22		I	2.79	
M-1612	5:4	2.653	0.200	13.27		I	5.02	
M-1642	5:3	1.140	2.400	0.48				
M-1675	5:3	2.794	2.333	1.20				
M-1394	5:0	4.419	0.000	31.12		I	13.58	
M-1643	4:11	5.550	0.500	11.10	18	I	5.63	78
M-1644	4:11	1.427	2.166	0.66	13	I	2.62	78
M-1641	4:11	3.700	0.750	4.93				
M-1390	4:9	1.175	1.500	0.78		II	1.26	04
M-1676	4:9	2.097	1.375	1.53				
M-1677	4:8	2.760	0.600	4.60		II	1.38	
M-1645	4:7	3.008	1.166	2.58				02
M-1678	4:6	2.344	1.166	2.01				
M-1649	4:6	1.805	1.000	1.81		III	0.81	10
M-1650	4:5	2.636	1.200	2.20	14	I	1.71	24
M-1651	4:4	1.254	1.857	0.68	17	I	4.38	-10
M-1679	4:3	2.150	1.330	1.61				
M-1652	4:3	4.037	0.500	8.07	12	III	8.12	52
M-1653	4:2	1.538	1.285	1.20	09	II	6.03	08
M-1671	4:2	2.030	2.000	1.02				
M-1658	4:2	2.140	1.400	1.53		II	5.86	-04
M-1659	4:1	2.786	1.166	2.39	09	III	1.25	34
M-1680	4:0	14.890	1.800	8.27				
M-1681	3:11	1.400	0.750	1.87				
M-1682	3:11	1.941	1.500	1.29		III	0.70	
M-1530	3:11	1.277	1.875	0.68	17	II	3.63	06
M-1660	3:10	3.913	2.000	1.96				-12
M-1544	3:8	1.524	2.250	0.68		III	1.15	14
M-1707	3:7	1.031	3.250	0.32		III	0.37	
M-1661	3:6	1.524	1.500	1.02	13	III	0.52	14
M-1705	3:6	2.319	1.500	1.55	11	III	2.71	58
M-1662	3:5	1.041	2.125	0.49	09	III	0.44	50
M-1663	3:4	2.075	0.500	4.15				34
M-1640	3:4	2.047	1.833	1.12				
M-1664	3:3	1.097	3.666	0.30	18	III	0.58	20
M-1714	3:1	1.441	2.166	0.67	06	III	0.54	56
M-1639	3:0	1.121	2.571	0.44				
M-1638	2:11	1.645	1.571	1.05				
M-1636	2:10	1.630	1.666	0.98				

TABLE VI

DESCRIPTIVE DATA AND TEST SCORES FOR INDIVIDUAL GIRLS WHO PARTICIPATED IN A STUDY OF THE INDEPENDENCE OF YOUNG CHILDREN

(N = 63)

Sex and Code No.	Age	Puzzle Box Test: Level of Difficulty	Puzzle Box Test: Level of Help	Puzzle Box Test: Independence Score	Validity Score	Puzzles Test: Ability Group	Puzzles Test: Independence Score	Conformity-Nonconformity D-Score
F-1606	6:3	3.859	1.200	3.22	19	II	6.68	
F-1634	6:3	2.863	0.666	4.30				
F-1619	6:2	3.450	0.833	4.14				
F-1635	6:2	4.022	1.166	3.45	17	I	4.89	
F-1631	6:2	2.533	0.400	6.33	13	I	3.15	
F-1609	6:0	2.049	1.000	2.05	17	I	1.07	
F-1611	6:0	2.766	1.500	1.84	17	I	5.23	
F-1627	6:0	2.796	1.000	2.80	21	I	3.99	
F-1621	5:11	1.123	1.400	0.80				
F-1602	5:9	3.133	1.166	2.69	14	I	5.95	
F-1646	5:9	2.350	0.750	3.13	23	I	3.34	
F-1601	5:9	1.495	0.750	1.99	06	I	1.33	
F-1600	5:8	3.961	1.000	3.96	15	I	4.66	
F-1622	5:8	2.916	0.833	3.50	14	I	1.25	
F-1554	5:8	2.741	2.000	1.37				
F-1603	5:7	3.044	0.833	3.65	13	I	1.74	
F-1620	5:7	2.937	1.250	2.35	21	II	7.57	
F-1618	5:7	3.075	1.500	2.05	15	I	4.93	
F-1605	5:5	2.313	0.400	5.78	18	II	2.87	
F-1690	5:4	1.033	2.666	0.39		III	1.19	
F-1524	5:3	3.045	0.750	4.06		I	1.56	
F-1608	5:3	2.211	1.666	1.33				
F-1613	5:2	2.469	0.833	2.96				
F-1672	5:1	1.985	3.285	0.60				
F-1632	4:11	2.979	0.125	23.83				
F-1673	4:10	2.272	2.000	1.14				
F-1556	4:10	1.980	1.600	1.24		I	1.08	
F-1654	4:9	1.286	2.200	0.58	20	I	0.52	16
F-1480	4:8	2.591	1.000	2.59				
F-1626	4:8	2.780	0.666	4.17				
F-1655	4:8	3.283	1.666	1.97				10
F-0739	4:8	1.771	1.285	1.38	15	I	2.32	12
F-1623	4:7	4.405	2.000	2.20				
F-1647	4:7	2.958	1.500	1.97	14	I	6.00	74
F-1683	4:7	2.300	1.330	1.73		III	2.24	
F-1400	4:6	2.302	1.166	1.97		I	0.81	-18
F-1674	4:6	1.908	1.500	1.27				
F-1684	4:6	2.730	1.000	2.73		II	3.34	
F-1397	4:5	1.411	1.666	0.85		I	6.24	50
F-1514	4:4	2.677	2.166	1.24				
F-1510	4:4	1.890	1.714	1.10				
F-1685	4:4	3.400	0.670	5.07		II	5.18	
F-1656	4:3	1.727	1.166	1.48	11	III	1.14	46
F-1657	4:1	1.311	1.571	0.83		III	0.49	22
F-1628	4:1	2.897	1.000	2.90				10
F-1616	4:0	2.608	1.250	2.09				
F-1689	3:11	1.511	2.500	0.60				
F-1665	3:10	2.425	1.500	1.62	14	III	4.30	38
F-1713	3:9	1.342	2.142	0.63	17	III	0.82	66
F-1666	3:8	1.752	1.166	1.50	14	II	1.17	06
F-1572	3:8	3.525	1.000	3.53		III	2.82	
F-1710	3:8	2.958	1.166	2.54	13	III	2.45	16
F-1667	3:8	1.928	0.857	2.25	24	III	1.22	62
F-1668	3:7	1.333	2.166	0.62	16	III	0.84	24
F-1686	3:6	1.702	2.000	0.85		III	0.80	
F-1688	3:5	1.918	2.142	0.90		III	0.47	
F-1648	3:5	1.504	2.285	0.66				
F-1669	3:5	2.330	2.285	1.02	18	III	0.97	34
F-1708	3:5	1.830	1.000	1.83	13	II	1.31	60
F-1687	3:3	1.857	2.285	0.81		III	0.38	
F-1670	3:3	2.868	1.375	2.09				72
F-1637	2:11	2.035	1.625	1.25		III	0.96	
F-1607	2:10	1.000	3.142	0.32				

APPENDIX B

The Puzzles Independence Test

The Puzzles Independence Test, developed by Smith (1969), consists of (1) a pretest in which a puzzle is demonstrated and the child's ability is determined, and (2) a set of eight puzzles, graded in difficulty and administered in a way that permits the child to behave in a dependent or independent manner.

The Puzzles Independence Test was developed as part of a larger research project in which the Puzzle Box Independence Test was developed. The administration and scoring are essentially the same for the two instruments. A sample score sheet, Figure 5, includes an illustration of the scoring of the Puzzles Independence Test.

SCORE SHEET - PUZZLES INDEPENDENCE TEST

Name Child F-1686 Code No. F-1686

Birthdate 8-29-65 Age 3:6

School St. Francis Date 3-26-69

Time on Pretest 60" Group III

2-piece ||

3-piece |||| ?oh|

4-piece ||| ?o |||| ?oh || ?oh| ?oh|

5-piece |||| ?o| ?oh ||||

6-piece ||| ?oh || ?oh || ?oh|

7-piece |?oh || ?oh |||

5-piece ||| ?oh |?ohll

3-piece |||

Puzzle	Attempts	Level of Difficulty	Help
3-piece	5	1.666	1
4-piece	11	2.750	3
5-piece	9	1.800	1
6-piece	8	1.333	3
7-piece	6	0.857	2
5-piece	6	1.200	2
		9.606	12

Mean Difficulty : 1.601
Mean Help : 2.000
INDEPENDENCE SCORE : 0.800

Figure 5. Method of Scoring the Puzzles Independence Test

VITA 2

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Candidate for the Degree of

Master of Science

Thesis: INDEPENDENT BEHAVIOR OF YOUNG CHILDREN: THE RELATIONSHIP OF INDEPENDENCE TO CONFORMING BEHAVIOR

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