THE RELATIONSHIP OF INDEPENDENT BEHAVIOR TO CREATIVE EXPRESSION IN EARLY CHILDHOOD

By

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CHAPTER I

INTRODUCTION

Purpose

The purpose of this research was to study the relationship between preschool children's independent behavior and several characteristics which may be related to creative ability. Specifically, the characteristics studied were originality, verbal intelligence, flexibility, and independence, as related to sex and age. Originality was chosen because it is generally accepted as a valid indicator of creative ability. The verbal intelligence measure was used in order to be certain that the Originality Test was not merely another measure of intelligence. Flexibility was chosen as an indicator of the ability to adapt or adjust to change, a quality which is considered essential for creative expression.

Problem

> Dependence upon superior authority and compliance with the suggestions of authority are among the child's earliest social responses. This relationship is never wholly lost. ... Children may grow in independence without losing their tendency to comply with authority and without losing a sort of affectional dependence (English, 1962, p. 23).

Implied in the above statement, and supported by other writers, is a relationship between emotional independence and instrumental independence. This relationship is comparable to the stages of basic trust and

autonomy, as described by Erikson (1950); and it is to be expected that the child's development in one area or stage will be influenced by his development in the other.

Emotional independence is described as the absence of need for reassurance, affection or approval in particular situations. This, as a positive quality, has been called emotional self-reliance. On the negative side, emotional dependence suggests that a person has needs which require that other people respond in particular ways in order that his needs be satisfied (Heathers, 1955). In the area of emotional dependency, socialization has as its ultimate aim that the child be fond of his mother rather than passionately attached to her and be pleased by her attention but not incessantly demanding of it (Sears et al, 1957).

Instrumental independence refers to conducting activities and coping with problems without seeking help. On the positive side, the child who is freely independent wants to do things by himself and gains satisfaction from doing so. Presumably, he is also freely dependent, as indicated by a willingness to accept help in situations which are obviously difficult for him. On the negative side, there seem to be two extremes, compulsive dependence and compulsive independence. The compulsively dependent child seeks help even when he is capable of being independent; whereas the compulsively independent child insists that he can do things by himself even when tasks are obviously much too difficult for him. This has been described as self-assertive because of the child's insistence upon mastering tasks and dominating others (Beller, 1955; Heathers, 1955; Hurlock, 1964).

Theoretically, free independence (particularly independence in thinking) is necessary for creative expression and creative learning. In order to study the development of creative ability in early childhood, we need a greater understanding of the ways in which independence is expressed as well as an understanding of the factors and relationships that influence the development of independence in early childhood.

To the extent that the present research contributes to an understanding of instrumental independence as a characteristic of the young child, it is seen as a contribution to the larger problem described above. The present research includes a study of age and sex differences in independence and an analysis of the relationship of independence to other qualities which are related, at least in theory, to the creative potential of the young child.

CHAPTER II

REVIEW OF LITERATURE

The review of literature will include (1) a discussion of the methods which have been used in measuring independence; (2) a review of the research relating independence to age, sex, intelligence, play activity, and peer acceptance; (3) relevant research in the area of independence training; and (4) implications for the present research.

Research Methods

Research methods used in the study of independence include structured and unstructured observations, interviews, experimental situations, and specific tests of independence. Some methods are concerned with affectional independence and others with instrumental independence, while others are concerned with both.

Observations

Heathers (1955) used unstructured observations in measuring the emotional dependence of children two to five years old. Data were obtained by non-participant observers who made running records of three minute time samples of each child's play behavior. This behavior was then rated in terms of 14 predetermined categories which indicated various degrees of emotional dependency.

Highberger (1955) used structured observations and a rating scale to measure the young child's early adjustment to school. Successful

adjustment included emotional independence, e.g., child leaves parent willingly when he is brought to school, and instrumental independence, e.g., child initiates an activity on his own. For these measures, the children were rated by trained observers. These ratings were supplemented by the subjective judgments of the teachers after the children had been in nursery school for several weeks.

Marshall (1957) measured affectional dependency in a free-play situation. The number of adult-child interactions was accepted as indicating the child's affectional dependency. Marshall was concerned with the relationship between dependence on adults and social acceptance by peers.

Beller (1955) used trained observers, who worked in pairs, to rate children's behavior in terms of different aspects or components of dependence and independence. Descriptions of these components (e.g., autonomy, persistence, exploration of the environment) suggest that Beller's focus was on instrumental independence.

Interviews

Interviews with mothers have been used in studies of preschool children's dependent behavior, affectional and instrumental. Open-end questions, which allowed for discussion, were used by Sears, Maccoby and Levin (1957). Questions about emotional dependency were focused on the amount of attention the child seemed to want, the child's tendency to follow his mother around and hang onto her skirts, and the child's reaction when the mother went out and left him with someone else. The mother's responses to these questions were rated on a continuum from no emotional dependence to great emotional dependence.

Experimental Situations

Smith (1958), in her study of emotional dependence, was interested in the behavior of mothers in response to their children's dependency solicitations. She designed an experimental situation in which the mother and child were observed at a time when they were interacting freely and again when the mother was occupied filling out a questionnaire. During the experiment, the child was observed for "actions which seemed to be primarily directed toward stimulating the mother to give help or attention which she did not volunteer and actions that were primarily in response to situations which the mother seemed to set up." The child's dependency as indicated by these actions was studied in terms of "the conditions under which he sought help, the methods he used to solicit aid and the kind of help or attention he desired."

Gewirtz (1954) was interested in factors which influence the attention-seeking behavior of young children. To the extent that attention-seeking behavior is an indication of emotional dependency, this method of measuring attention-seeking is of interest. In his experiment, the child painted at an easel, while an adult nearby was ready and willing to respond to all overtures made by the child. The frequency of these overtures was the measure of the attention-seeking, i.e., emotional dependency.

Tests of Independence

Inlay puzzles and puzzle boxes have been used to measure young children's independence in the creativity research at Oklahoma State University (Tether, 1961; Griffin, 1966; White, 1967). With each of these tasks, the child's refusal or acceptance of help in completing

the puzzle determines the degree of his independence or dependence. Puzzle boxes, used to measure independence in the present study are described in detail in Chapter III.

Independence, Age, Sex, and Intelligence

In the literature, writers refer to older children as being less dependent than younger children. However, there is little research to support this generalization. Heathers (1955) studied dependency in children and found that as the child increased in age he became less dependent on his teacher; he did not cling to her nor seek her attention as much as he did when younger.

The literature reports a general belief that girls are more dependent on their mothers than boys; but neither Heathers (1955) nor Sears (1957) found any sex differences in emotional dependency.

Crandall (1960) found that nursery school children described as "achievers" were less dependent on adults for help and emotional support than were other children. In other words, achievers are instrumentally and emotionally independent of adults. Crandall (1967) also found that nursery school children showing increases in intelligence were consistently independent.

Independence, Play Activities, and Peer Acceptance

Heathers (1955) found a relationship between play variables and dependence-independence. He interpreted this as meaning either (1) that the play activity itself encourages or discourages the dependent responses, or (2) that the child's dependence or independence influences his choice of play activities. "Thus, a socially confident child might

be expected to engage more in social play, to be more assertive, and to seek attention or approval from children more often than a socially insecure child."

Marshall (1957) found that independence was negatively related to peer acceptance. Children who were dependent on adults were rated low in social status and social participation.

Independence Training

Our society values independence and the independent individual. According to Sears (1957), independence training is a major area of socialization in early childhood. In a study of creative behavior in five different cultures, Torrance (1965) found that "independence of thinking" and "independence of judgment" were characteristics of special value only in the United States and Germany (Berlin). Watson (1957) studied children from strict homes and permissive homes, and found that "greater freedom of the child is clearly associated with more initiative and independence."

As the child matures and acquires the skills for independent behavior, the child-training methods and learning opportunities afforded by the home will greatly influence whether he will actually progress toward independence (Hurlock, 1964).

Implications for the Present Research

Theoretically, freedom to be independent is necessary for creative expression and creative learning. In order to study the development of creative ability in early childhood we need a greater understanding of the ways in which independence is expressed as well as an understanding

of the factors and relationships that influence the development of independence in early childhood.

Two areas of independent behavior are suggested in the literature: emotional independence and instrumental independence. The choice of the Puzzle Box Test as the instrument to be used in the present research, automatically limited this study to instrumental independence.

The literature indicates that age, sex, and intelligence are related to independent behavior. Some studies are focused on emotional independence, others on instrumental independence or both. In some studies the findings are contradictory; and there is little supporting research for some of the generally accepted beliefs. Age, sex, and intelligence are variables which will be included in the present study.

The Oklahoma State University creativity research has included measures of originality and flexibility, but these have not been studied in relation to independence. A study of these relationships will be included in the present research.

CHAPTER III

METHOD AND PROCEDURE

This chapter includes the research design, a description of the subjects, information about each of the tests used in the study, a detailed description of the Independence Test, and recommendations for the analysis of data.

Design

As a part of the creativity research program at Oklahoma State University, a study was needed of the relationships among characteristics and abilities generally accepted as contributing to creative expression. The present research was designed as a study of some of these relationships, with particular emphasis on instrumental independence.

The specific characteristics chosen for study were independence, originality, verbal intelligence, and flexibility. Data on flexibility had been gathered for another study; and the availability of this data automatically indicated the specific children who should participate as subjects in the present research. Additional data were gathered cooperatively with other researchers. Tests for the measurement of originality, verbal intelligence, and independence were administered during the last month of the school year. The flexibility test had been administered approximately two months earlier.

Subjects

The subjects who participated in this study were 34 preschool children, 17 girls and 17 boys. The age range of the children was from three years six months to five years six months. The three and four year old children were from the Oklahoma State University Child Development Laboratories and the five year old children were from a community kindergarten program. The distribution of subjects by sex and age is presented in Table I.

The Research Instruments

Independence Test

A puzzle box test, adapted for use in the study of independent behavior, was used in the present research. For each child, the degree of independence or dependence was determined by his refusal or acceptance of help in completing the task.

Because a major emphasis of the present study was on instrumental independence and its relationship to the other variables measured, a detailed description of the test, its administration and scoring, is discussed in the next section.

Originality Test

The Originality Test for preschool children, designed by Starkweather (1966), consists of three-dimensional plastic forms, which are presented to the child one at a time, and to which he responds by telling what each piece might be. There are ten different forms, and each is presented four times, making a total of 40 responses. Each child's originality score is a numerical count of the number of

TABLE I

DISTRIBUTION OF SUBJECTS BY AGE AND SEX
(N = 34)

	N	Age in Months	
		Median	Range
Group I			
Boys	5	51	50-54
Girls	7	48	42-51
Total	12	50	42-54
Group II			
Boys	6	55	49-58
Girls	5	56	53-58
Total	11	55	49-58
Kindergarten			
Boys	6	63	61-65
Girls	5	62	61-66
Total	11	62	61-66
Total			
Boys	17	55	49-65
Girls	17	54	42-61
Total	34	55	42-65

different responses he gives, with high scores thus indicating the more original children. A complete description of this test, its administration and scoring, is presented in Appendix C.

Verbal Intelligence Test

A verbal intelligence test was used in order to be certain that the Originality Test was not merely another measure of intelligence. The Peabody Picture Vocabulary Test (PPVT) was chosen. This test is interesting to the children; it takes only 10 to 15 minutes to administer; and it requires no verbal responses. The child merely points to pictures as the examiner says the vocabulary words. The scoring of the test is a simple numerical count of the number of correct responses. The scores can be changed to age equivalents (mental age) and standard score equivalents (intelligence quotients); but for the purpose of the present research, these conversions were not made and raw scores were used.

Flexibility Test

The Flexibility Test, developed as a part of the creativity research program at Oklahoma State University, was a rather complex research instrument which required an understanding of the concepts of shape, size and brightness. For each child, flexibility was determined by his ability to adapt to a "reversal shift." For example, when the child had learned that "large" was the correct response in the game he was playing, a new game was introduced in which "small" was the correct response. A complete description of this test, its administration and scoring, is presented in Appendix D.

Independence Test

A puzzle box for measuring children's responses to failure, was first developed by Keister (1937). Similar puzzle boxes, adapted for use in the study of independent behavior (Griffin, 1966), were used in the present research. For each child, the degree of independence or dependence was determined by his refusal or acceptance of help in completing the task.

Puzzle Boxes

The puzzle boxes are approximately 9" x 12" in length and width, and one-fourth inch in depth. Each contains a number of wooden pieces, cutouts of familiar objects, such as an ice-cream cone and a duck. Only when the pieces are placed flat in the box can the lid be closed. The instrument consists of two puzzle boxes, a demonstration box containing 12 pieces and a test box containing 13 pieces. In spite of the fact that the task looks easy, it is most difficult for children of preschool age. (See Figures 1 and 2.)

Administration

The puzzle boxes are administered to each child individually. The child is brought to the testing room and seated at a low table with the experimenter. The experimenter shows the demonstration puzzle box to the child and lets him open it. She then explains, "We will do this one together. You take out a piece and then I'll take out a piece." When all the pieces have been removed, she says, "Now you put in a piece and then I'll put in a piece." When the demonstration puzzle box is finished, the experimenter shows the second puzzle box to the child. As

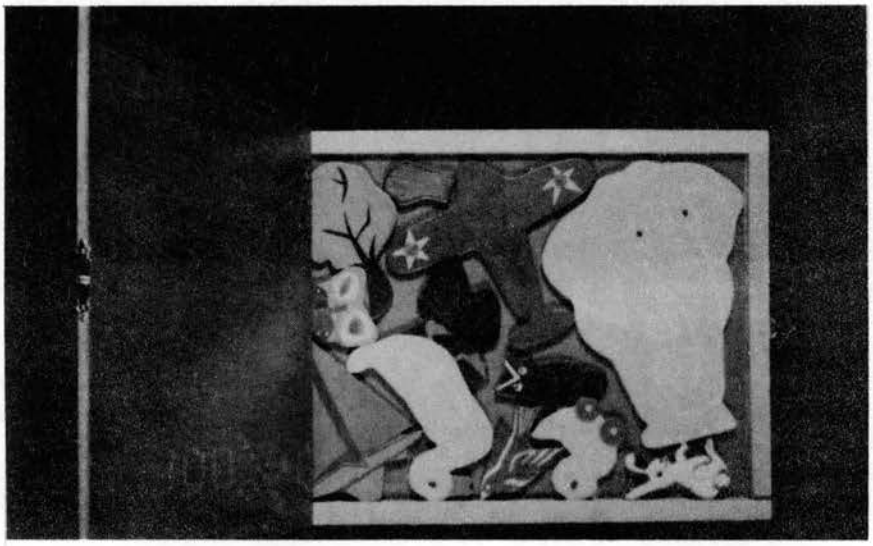

Figure 1. Demonstration Puzzle Box

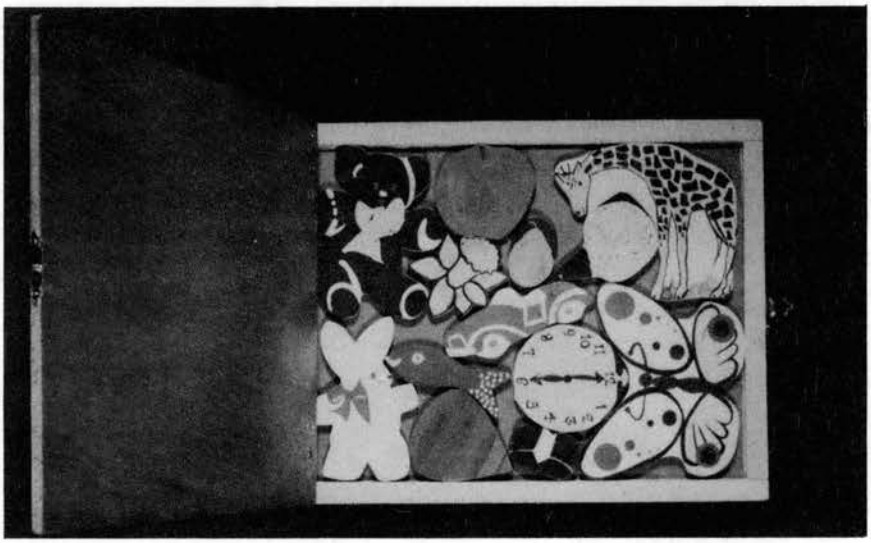

Figure 2. Puzzle Box Test

he opens it, the experimenter says, "This one you can do by yourself. I'll help you if you want me to."

The Puzzle Box Test indicates the child's independence in terms of his refusal or acceptance of help in completing the task. If the child asks for help, the experimenter removes an incorrectly placed piece, puts one piece in correctly, and encourages the child to continue. If the child does not ask for help, he is offered help after he has tried to place 20 pieces in the box. This procedure is repeated until the child has requested or been offered help four times. The puzzle box is then completed with or without the help of the experimenter.

Scoring

The scoring of the Puzzle Box Independence Test is a simple numerical count of the number of pieces the child tries to place in the box by himself. The possible range of scores is from zero to 80. (The actual range of scores in the present research was from five to 80.) A sample score sheet is presented in Appendix B.

Recommended Analysis

1. The data for each variable should be analyzed for age and sex differences, using the Mann-Whitney U Test.

2. The relationships among the variables should be analyzed, using Spearman rank order correlations.

CHAPTER IV

RESULTS

The data analyses presented in this chapter include an analysis of sex and age differences for each variable (verbal intelligence, flexibility, originality, and independence), and an analysis of the relationships among these variables with particular emphasis on independence. Data for individual subjects are presented in Table V, Appendix A.

Sex Differences

The Mann-Whitney U Test was used to analyze all data for sex differences. Median scores, ranges and average ranks for boys and girls are presented in Table II. There were no significant differences in test scores according to sex.

Age Differences

Test results for the three age groups are presented in Table III. For two of the tests, verbal intelligence and flexibility, there were significant differences in the scores of the three age groups. Mann-Whitney U Tests were used for these analyses.

In verbal intelligence (PPVT), the Kindergarten children scored significantly higher than the children in Group I ($z = 2.189$; $p < .02$). Verbal intelligence increases with age; and therefore, this difference

TABLE II

TEST RESULTS FOR BOYS AND GIRLS: MEDIAN SCORES, RANGES, AND AVERAGE RANKS
(Boys, N = 17; Girls, N = 17)

Test and Sex Group	Median	Range	Average Rank
Independence			
Boys	35	17-80	17.32
Girls	46	05-77	18.34
Flexibility			
Boys	.812	.500-1.000	17.12
Girls	.750	.187-1.000	18.59
Originality			
Boys	15	07-28	16.23
Girls	17	10-34	18.78
PPVT			
Boys	52	38-63	18.20
Girls	49	42-63	17.30

TABLE III

TEST RESULTS FOR THREE AGE GROUPS: MEDIAN SCORES, RANGES, AND AVERAGE RANKS
(N* = 34)

Test and Sex Group	Median	Range	Average Rank
Independence			
Group I	31	05-80	13.92
Group II	59	17-76	19.50
Kindergarten	48	28-80	19.41
Flexibility			
Group I	.687	.187-0.937	13.04
Group II	.750	.500-0.937	16.05
Kindergarten	.812	.500-1.000	23.82
Originality			
Group I	15	10-29	16.25
Group II	16	10-24	15.18
Kindergarten	22	07-34	21.18
PPVT			
Group I	47	38-63	12.96
Group II	49	43-63	18.05
Kindergarten	55	43-63	21.91

*Group I, N = 12; Group II, N = 11; Kindergarten, N = 11.

is in the expected direction. No other group differences in verbal intelligence were significant.

Results of the Flexibility Test indicated that the Kindergarten children were more flexible, or more adaptable, than the children in Group I ($z = 2.429$; $p < .01$) and in Group II ($z = 2.035$; $p < .03$).

Relationships Among the Variables

The Spearman rank order correlation was used to analyze the relationships among the five variables: age, independence, flexibility, originality, and verbal intelligence (PPVT). The correlation coefficients are presented in Table IV.

No significant relationships were evident among the variables except those which were evident in the analysis of age differences. Age is positively correlated with flexibility ($r_s = +0.461$) and with verbal intelligence ($r_s = +0.444$). Older children are more flexible and have greater verbal intelligence than do younger children.

Summary

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

1. There were no significant sex differences for any of the variables studied.

2. The older children showed significantly greater verbal ability than the younger children.

3. The older children showed significantly greater flexibility than the younger children.

TABLE IV

SPEARMAN RANK ORDER CORRELATION COEFFICIENTS
AMONG THE VARIABLES
(N = 34)

	Independence	Flexibility	Originality	PPVT
Age	0.236	0.461*	0.237	0.444*
PPVT	0.222	0.188	0.200	
Originality	-0.130	-0.005		
Flexibility	-0.042			

*Significant beyond the .01 level

4. Except for the relationship to age mentioned above, there were no significant correlations among the characteristics and abilities measured.

CHAPTER V

SUMMARY AND IMPLICATIONS

The purpose of this research was to study the relationship between preschool children's independent behavior and several characteristics which may be related to creative ability. Specifically, the characteristics studied were originality, verbal intelligence, flexibility, and independence, as related to sex and age.

Two areas of independent behavior were suggested in the literature; emotional independence and instrumental independence. Emotional independence is described as the absence of need for reassurance, affection or approval. Instrumental independence refers to independence in conducting activities and coping with problems. The choice of the Puzzle Box Test as the instrument to be used in the present research limited this study to instrumental independence.

The subjects who participated in this study were 34 preschool children, 17 girls and 17 boys. The age range of the children was from three years six months to five years six months. The three and four year old children were from the Oklahoma State University Child Development Laboratories and the five year old children were from a community Kindergarten program.

Tests were administered for each of the variables, originality, verbal intelligence, flexibility, and independence. The Originality Test consisted of three-dimensional plastic forms, which presented to

the child one at a time, and to which he responded by telling what each piece might be. Each child's originality score was a numerical count of the number of different responses he gave, with high scores thus indicating the more original children. A verbal intelligence test was used in order to be certain that the Originality Test was not merely another measure of intelligence. The Peabody Picture Vocabulary Test (PPVT) was chosen. The Flexibility Test measured a young child's ability to adapt to new situations when a change in behavior was required. The test consisted of training tasks during which the child learned certain "correct" responses (based on the concepts of shape, size, and brightness) and reversal shift tasks in which he was required to abandon the learned responses in order to adapt to new situations. The child's flexibility was indicated by the ease with which he is able to adapt. The major emphasis of the study was independence. A Puzzle Box Test, adapted for use in the study of independent behavior, was used. For each child, the degree of independence or dependence was determined by his refusal or acceptance of help in completing the task.

A comparison was made of the scores of the four variables, originality, verbal intelligence, flexibility, and independence as related to sex and age. There were no significant sex differences for any of the variables studied. The older children showed significantly greater verbal ability and significantly greater flexibility than did the younger children. Except for these relationships to age, there were no significant correlations among the characteristics and abilities measured.

Implications for Future Research

One problem with the present research instrument was that a child did not necessarily experience success when the experimenter helped him. To correct this problem, the instrument might be modified so that the child would have clear success experiences. Perhaps a series of more simple puzzle boxes could be used, and the help the child is given might enable him to finish one box, thereby assuring a success experience before he proceeds to the next box.

Administration and scoring presented other problems. The child was supposed to be offered help at regular intervals and given help whenever he asked for it. A problem arose because some children looked as though they wanted help but did not specifically ask for it. The administration procedure needs to be refined in order to eliminate this problem. The scoring of the test was a simple numerical count of the number of pieces the child tried to put in the box by himself. Scoring was a problem for the experimenter in that she was unsure of when the child was actually trying to fit a piece into the puzzle box. The child might pick up a piece and put it down without actually trying to put it in the box, or he might lift a piece from the box and then put it right back in again. In the refinement of the instrument the scoring problem should be clarified.

The behavior of some children during the test suggested that the children who were rated as independent included children who were compulsively independent and children who were freely independent. Theoretically, the compulsively independent child refuses help and must do everything by himself, and the compulsively dependent child asks for

and accepts help even when he is capable of doing the task by himself; whereas the free child refuses help if he believes there is a possibility that he can accomplish the task alone, and accepts help if the task is obviously too difficult for him to accomplish alone.

The instrument used in the present research was a puzzle box test which appeared to be easy. In this situation the compulsively dependent child accepted help, while the free child and the compulsively independent child refused help. A new instrument, which looks hard and is really too difficult, might differentiate between these two groups, the compulsively independent and the free. If the task were obviously difficult, the free child and the dependent child could be expected to accept help, while the compulsively independent child would continue to refuse help.

In the discussion above, a relationship is suggested between the two dimensions, free-compulsive and dependent-independent. A picture of this relationship is presented in Figures 3 and 4.

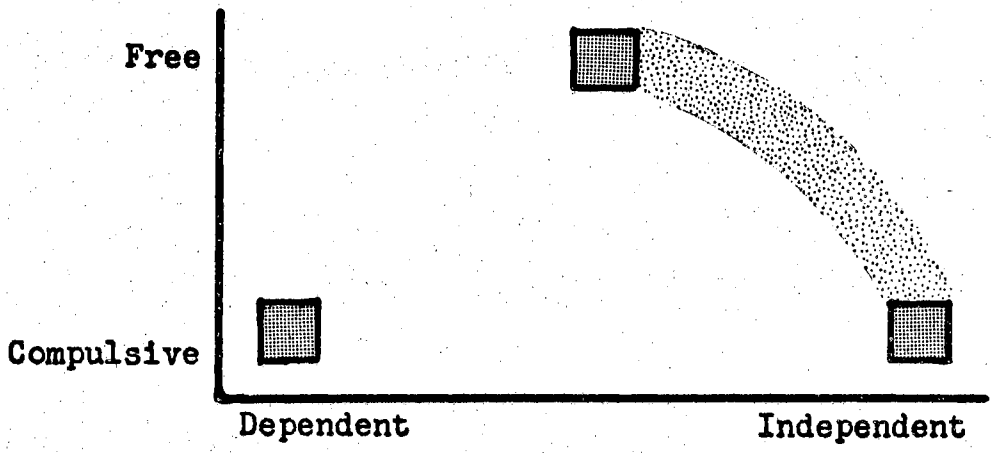

Figure 3. Responses of free and compulsively independent children are similar when a task appears easy.

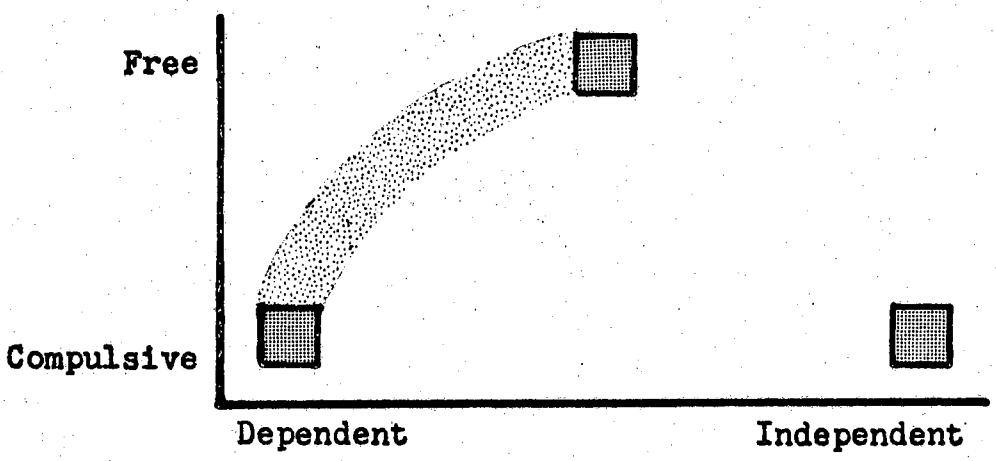

Figure 4. Responses of free and compulsively dependent children are similar when a task appears difficult.

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APPENDIX A

TABLE V

DATA FOR INDIVIDUAL CHILDREN PARTICIPATING IN A STUDY OF THE RELATIONSHIP OF INDEPENDENT BEHAVIOR TO CREATIVE EXPRESSION IN EARLY CHILDHOOD (N = 34)

Sex and Code No.	Group	Age	Test Scores				
			PPVT	Originality	Flexibility	Social Relations	Independence
F-1287	II	3:6	49	29	0.187	0.60	46
F-1310	II	3:10	52	19	0.687	0.19	05
F-1338	II	3:11	44	10	0.312	0.61	71
F-1307	II	4:0	44	14	0.500	0.81	18
F-1308	II	4:1	42	13	0.875	0.56	43
M-1312	II	4:2	49	15	0.812	0.40	18
M-1313	II	4:2	42	14	0.750	0.43	73
F-1286	II	4:3	45	20	0.937	0.58	26
M-1311	II	4:3	38	15	0.500	1.06	31
F-1306	II	4:3	50	18	0.375	1.27	31
M-1337	II	4:5	63	15	0.687	1.25	80
M-1291	II	4:6	53	15	0.812	0.45	20
M-1277	III	4:1	52	11	0.750	0.39	32
F-1314	III	4:5	49	10	0.875	0.25	76
F-1316	III	4:6	45	12	0.500	0.71	68
M- 772	III	4:7	44	24	0.812	1.00	33
M-1289	III	4:7	49	22	0.625	0.90	17
M-1317	III	4:7	43	21	0.500	1.13	71
F-1315	III	4:8	51	17	0.750	0.42	59
M-1318	III	4:9	57	10	0.812	0.12	62
F-1290	III	4:10	63	16	0.937	0.20	35
M- 777	III	4:10	63	12	0.625	0.72	35
F-1265	III	4:10	47	16	0.750	0.95	59
F-1321	Kgn.	5:1	61	28	0.750	0.96	66
M-1322	Kgn.	5:1	46	7	0.937	0.19	28
F-1332	Kgn.	5:1	46	20	0.937	0.88	31
M-1328	Kgn.	5:2	57	22	0.812	0.06	41
M-1329	Kgn.	5:2	55	28	1.000	0.18	52
F-1330	Kgn.	5:2	52	32	0.812	0.35	31
F-1335	Kgn.	5:2	56	10	1.000	0.55	77
M-1336	Kgn.	5:4	63	27	0.812	0.80	80
M-1324	Kgn.	5:5	43	11	0.812	1.11	32
M-1326	Kgn.	5:5	56	15	0.500	0.67	68
F-1333	Kgn.	5:6	53	34	0.875	0.14	48

APPENDIX B

INDEPENDENCE TEST for PRESCHOOL CHILDREN

Oklahoma State University
E. K. Starkweather, 10-1-67

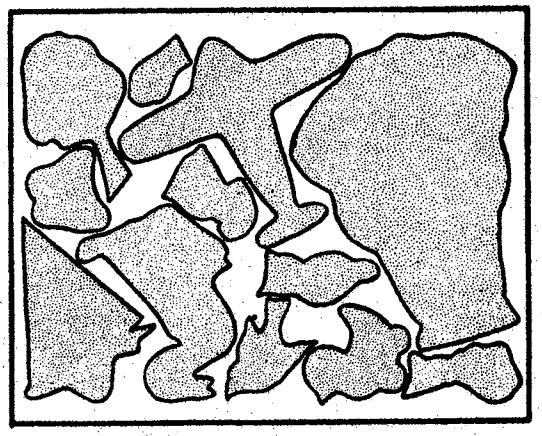
DATE _____ SCORE _____

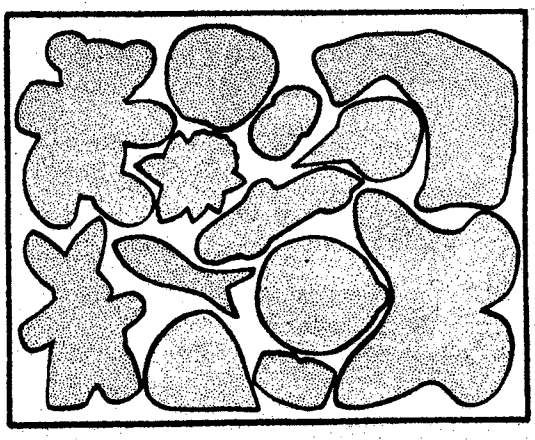
NAME _____ BIRTHDATE _____

SEX _____ No. _____ AGE _____

	Number of pieces placed independently	Help offered	Help requested
A.			
B.			
C.			
D.			
E.			

Comments





APPENDIX C

AN ORIGINALITY TEST FOR PRESCHOOL CHILDREN

developed by

Elizabeth K. Starkweather

Oklahoma State University
Stillwater, Oklahoma

Recommended Age Range

Approximately 3 years 6 months to 6 years 6 months.

The originality test depends on the child's ability to communicate verbally, and therefore, it should only be administered to children who are able to give at least four different ideas during the pretest or warm-up session.

Older children obtain higher originality scores than younger children. When the test is administered to older children (e.g., seven year olds), it cannot identify the more original children inasmuch as the median score for such a group is apt to be near the ceiling of the test.

Pretest or Warm-up Session

Six white styrofoam pieces, each a different shape, are placed on the table before the child. The child is encouraged to manipulate them and to talk about them. He may be asked a question such as, "Do you see a piece that looks like something?" When the child responds, the experimenter agrees with his comment, whatever it is, and encourages him to talk about another piece. If the child does not respond, the experimenter picks up the rectangular piece and asks, "What could this be?" If the child still does not respond, the experimenter makes a suggestion in the form of a question, e.g., "Do you think it could be a window?" The experimenter may then move this piece a little to one side, if necessary, in order to focus the child's attention on the other pieces.

If the child gives the same response for different pieces, his response is accepted, but he is asked to think of something else that the piece might be. For example, if the child said that two different pieces could be a door, the experimenter would accept his response and at the same time encourage him to think of something different. "Yes, it certainly could be a door, but we already have one door. Can you think of something else that it could be?"

After the child has responded to the six forms, the experimenter praises him by saying, "Good, you thought of something different for all these." In this way, during the warm-up session, the experimenter encourages the child to think of different responses for the various forms. (During the test proper, the child's responses are accepted without question even though he may repeat the same idea several times.)

Originality Test

The originality test is administered by showing the child one pair of identically shaped styrofoam pieces at a time. When he is shown the first pair, he is given his choice of the color he prefers. (The colors in Form-A are red and blue; and the colors in Form-B are green and yellow.) The color the child chooses is then placed on the table before him and the other is placed in front of the experimenter. The child is then asked what his piece could be or what it could be made into. After he responds, he is asked what the experimenter's piece could be. For the first pair, and occasionally during the remainder of the test, the experimenter includes the child's response in his next question. "If yours is a (caboose), then what could mine be?" Approval of each response is given by saying something such as, "All right," or "It certainly could be." Whether or not a child gives different responses for the various shapes, his efforts are approved in the same manner.

When all ten pair of styrofoam forms have been shown to the child, the entire set is again presented. This time the child is given the other color, i.e., the one he had not chosen when they were first presented. During this second administration, each piece is placed before the child in an alternate position, e.g., sideways or up-side-down.

Scoring

The combination of the two administrations of the research instrument offers four opportunities for a child to respond to each form, making a total of 40 responses. Each child's score is a numerical count of the number of different responses he gives. The responses are scored in the order in which the child has given them, and credit is given for each response which is different from all previous responses. Credit is given for objects which might be in the same category, such as a golf ball and a baseball. Credit is not given for an object which is named a second time and altered only by a minor adjective, such as a ball and a big ball. No credit is given for a play on words, such as kigless, pigless, and sigless.

Occasionally children respond by naming objects which they can see in the room. This is noted on the score sheet, and in these instances, credit is given only if the experimenter can see some relationship between the responses and the styrofoam form which the child is holding.

No norms have been developed for the Originality Test, nor will they be developed. The value of the test lies in its ability to identify the more original and the less original children within a given group and to compare different groups of children, e.g., age groups, cultural groups, etc.

Evaluation of the Originality Test

Inter-judge reliability in scoring was determined by a comparison of two sets of scores. (1) The responses of individual children were scored jointly by two judges who participated in the development of the test; and (2) the same responses were scored by another person, trained in child development, but who had no experience with the test and who had no instructions other than the written directions for scoring. The coefficient of correlation

(Pearson product-moment) between the two sets of judges' scores was +0.989, significant beyond the .01 level. In view of these findings, the directions for scoring were accepted as adequate. Their use should assure reliable scoring.

The internal consistency of the instrument was demonstrated by means of a split-half correlation (Spearman-Brown formula). A coefficient of +0.932 ($p<.01$) indicated that the test was reliable.

The validity of the instrument was demonstrated by comparing teachers' judgments with children's scores. Each child who scored high in originality was paired with each child who scored low, and teachers were then asked to indicate the child who was the more original in each pair. Teachers' judgments were in the direction of the originality scores in 106 pairs out of a total of 153. A Chi-square analysis indicated this extent of agreement to be statistically significant. ($\chi^2 = 22.752$; $p<.001$).

Test results indicate age differences in originality, but not sex differences. In a group of 80 children ranging in age from 3 years 6 months to 5 years 11 months, the older children earned the higher scores in originality. ($\chi^2 = 17.39$; $p<.01$).

Forms A and B of the originality test and the Peabody Picture Vocabulary test were administered to 18 children ranging in age from 3 years 4 months to 5 years 11 months. Half of these children were given the originality tests in an A-B sequence and the other half in a B-A sequence. A comparison of the scores obtained on the originality tests indicated that the two forms, A and B, were comparable. The product-moment correlation coefficient for the scores obtained on the two forms was +0.904 ($p<.01$), and for the scores obtained on the first and second tests was +0.892 ($p<.01$).

The originality test requires verbal responses; nevertheless, the originality scores are independent of verbal ability. This was demonstrated by a correlation of the PPVT scores (verbal ability) and the originality scores. The product-moment correlation coefficients for these two sets of scores were +0.192 for Form-A and +0.162 for Form-B, neither of which was statistically significant.

(Unpublished manuscript: 2-1-1966)

APPENDIX D

A FLEXIBILITY TEST FOR PRESCHOOL CHILDREN*

developed by

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The Flexibility Test is designed to measure a young child's ability to adapt to new situations when a change in behavior is required. The test consists of three training tasks during which the child learns certain "correct" responses (based on the concepts of shape, size, and brightness) and two reversal shift tasks in which he is required to abandon the learned responses in order to adapt to new situations. The child's flexibility is indicated by the ease with which he is able to adapt.

The Research Instrument

The research instrument is a green turntable one foot square, divided in half by a partition five inches high. On each side of the partition are two holes in which a reward object (a beaded peg) can be placed. The holes, two inches square and three inches apart, have removeable lids to which the stimulus objects are fastened. Thus, when the child makes his choice between two stimulus objects, he removes a lid and uncovers one of the holes. If he makes a "correct" choice, he finds a reward; and if he makes an "incorrect" choice, he finds nothing.

The stimulus objects are 16 paired objects differing in shape (round and square), 16 paired objects differing in size (large and small), and 16 paired objects differing in brightness (light and dark). For the training tasks, the round, the large, and the light objects of the pairs are the correct responses, i.e., the responses for which the child is rewarded. For the two reversal shift tasks, the correct responses are the small and the dark objects.

The reward objects are beaded pegs. Pegs of several different colors are used so that the child can choose a new color each time a new game (training task or reversal shift task) is introduced during the testing period. This choice of a new color serves to emphasize the fact that a new and different game is starting.

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*The Flexibility Test was developed as a part of the creativity research supported by the Oklahoma State University Research Foundation (State Project No. 329). Acknowledgement is given to Linda Guerkink and Janice Bowling, who assisted in the development of the instrument and in its adaptation for use in measuring flexibility.

Administration

The green turntable, the boxes of different colored pegs and a small peg board are on the table when the child is introduced to the Flexibility Test. He is asked to choose the color of the pegs he wants to play with first. Then, as the child watches, the experimenter drops a peg into one of the turntable holes and says, "This is how we play the game. I'll put a peg in one of the holes and then cover both holes, like this, so that you can't see the peg. Then you'll show me which hole you think the peg is in. You take this peg and put it in the peg board, and we'll start the game."

The five tasks which constitute the Flexibility Test are presented in the following order: (1) the training task for shape, which serves as a demonstration, (2) the training task for size, (3) the reversal shift for size, (4) the training task for brightness, and (5) the reversal shift for brightness.

Before each training task, the child is given an opportunity to show that he understands the concepts involved in the game. For example, a round and a square object are placed before him and he is asked to point to the round one and then to the square one. Then, during the training task, the stimulus objects are named as the child is asked to make his choice. For example, the child is asked, "Is it under the round one or the square one?" In this question the correct response is always stated first; but throughout the test, the correct response object is placed over the right or the left hole in a prearranged random order.

During the training tasks, when the child makes a correct response, the experimenter says, "Yes, it is under the (round) one." If his response is incorrect, the experimenter lifts the other lid and says, "No. See, it is under the (round) one." In this way the correct response is always reinforced by the experimenter. Also, at the beginning of each training task, when the child has made two consecutive correct responses, the experimenter says, "It is always under the (round) one, isn't it?"

Each training task is taught to the criterion of learning, 10 correct responses out of 12. If a child has not reached the criterion of learning after 32 presentations, the Flexibility Test is considered too difficult for him and he is eliminated from the study.

Before each reversal shift task, the child is asked to select a different colored peg for a new game. The experimenter carefully explains, "We are going to play a <u>new</u> game with these (blue) pegs. It is not the same as the last game. You'll have to think very hard. This is a different game." For each reversal shift task, only eight paired objects are presented.

Scoring

The Flexibility Test is scored by dividing the number of correct responses by the total number of responses. This formula yields a range of scores from 0.125 to 1.000. The latter is a perfect score and indicates that the child was able to adapt to the reversal shift with no difficulty whatsoever.

Implications

The Flexibility Test is a cumbersome instrument. It is in its infancy and neither reliability nor validity has been established. However, use of the test thus far has been promising and refinement is warranted.

Results obtained with the Flexibility Test, in a study of 54 young children, do have theoretical implications. (1) The children who had difficulty with the training tasks also had difficulty with the reversal shift tasks. Flexibility demands a degree of maturity. (2) Children who did well on the training tasks were not necessarily able to do well on the reversal shift tasks. Maturity is necessary for a child to be flexible, but maturity is not sufficient to insure flexibility.

The relationship which apparently exists between maturity and flexibility suggests a pattern of development which is presented schematically in Figure 1. This figure can be used to illustrate the changes in the flexibility of a single child as he matures; and it can also be used to illustrate the difference in flexibility that exists among children of the same age.

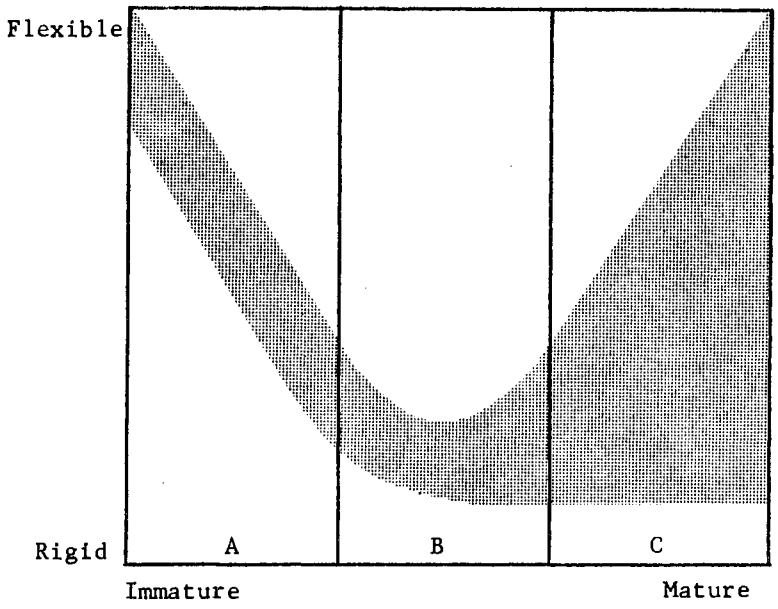

Figure 1. Schematic representation of the relationship between maturity and flexibility.

Theoretically, the development of a single child begins with behavior that is pseudo-flexible (Section A in Figure 1). At this stage, the immaturity of the child prevents him from generalizing or from seeing the similarity between tasks; therefore, he approaches a training task and a reversal shift task as though they were unrelated, and he performs equally well or poorly on both. His behavior, which in reality is immature, suggests flexibility because of the ease with which he shifts from the one task to the other.

As the child matures (Section B), his ability to generalize enables him to see the relationship between two similar tasks, but because of his egocentricity, he has difficulty shifting to a new point of view; therefore, he responds to the reversal shift just as he had learned to respond to the training task. At this stage, the child's behavior suggests rigidity because he continues to respond in a manner which was appropriate in a previously learned and similar situation.

With increased maturity (Section C), the child has become less egocentric. He is able to generalize and he is able to view a problem from more than one point of view. True rigidity and true flexibility now appear, i.e., rigidity and flexibility which are not merely a reflection of the child's level of maturity. At this level, the rigid child continues to show the behavior that he demonstrated when he was somewhat less mature (as in Section B). Rigidity has apparently become a compulsive characteristic and can no longer be explained as merely a sign of immaturity. On the other hand, with this increased maturity, the flexible child is able to adapt to the demands of the new situation. He recognizes the similarity of the tasks and he is able to profit from his understanding of the concepts he has learned, with the result that he is able to respond readily and correctly to the reversal shift tasks.

Theoretically, a group of children would show a range of behavior from rigid to flexible such as illustrated and described above. The youngest and most immature children would behave in a pseudo-flexible manner (Section A); those somewhat more mature would behave in a pseudo-rigid manner (Section B); and among the most mature children, behavior would range from compulsively rigid to freely flexible (Section C).

The Flexibility Test needs refinement and warrants extended use. The theoretical implications described above provide a framework which may help to guide future research.

VITA

Lenna Jane Baxter

Candidate for the Degree of

Master of Science

Thesis: THE RELATIONSHIP OF INDEPENDENT BEHAVIOR TO CREATIVE EXPRESSION IN EARLY CHILDHOOD

Major Field: Family Relations and Child Development

Biographical:

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