

THE DEVELOPMENT OF AN INSTRUMENT FOR THE MEASUREMENT
OF ORIGINALITY, IN PRESCHOOL CHILDREN

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Bachelor of Science

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1953

Submitted to the faculty of the Graduate School of
the Oklahoma State University
in partial fulfillment of the requirements
for the degree of
MASTER OF SCIENCE
May, 1964

JAN 8 1955

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ACKNOWLEDGMENTS

Acknowledgment is given to the Oklahoma State University Research Foundation for their interest in the research as a contribution to the study of creative ability in young children.

The writer wishes to express sincere appreciation to those people who helped make this study possible. To Dr. Elizabeth K. Starkweather, deepest gratitude is given for her enthusiasm, inspiration, and tireless effort throughout the study. To Mrs. Masters, who so willingly scored the children's responses, special thanks is given.

Appreciation is expressed to Dr. Stanley Fowler for his critical reading of the manuscript, and to Mrs. Marjorie Tewell, Mrs. Opal Collins, Mrs. Sally Douglas, Mrs. Wanda Flora, and Mrs. Bobbie Halbrook for their cooperation and help in judging the originality of their children.

To each precious child participating in the study and in the pilot work go special thanks for their delightful responses.

The writer is also grateful to her own children and husband for their support and encouragement.

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CHAPTER I

INTRODUCTION

Purpose

The purpose of this research is to develop an instrument for the measurement of originality in preschool children. Originality is considered an essential, intellectual ability of the creative person.

Definition

Originality is the ability to respond both in an adaptive and an unusual manner (Barron, 1963). Accordingly, an original response is both uncommon and applicable to reality.

Originality is assumed to be an ability possessed by all persons, with some persons having more of this ability than others.

Problem

Educators for many years have indicated their concern about the development of creative ability and actually have recognized creative ability as an important part of intelligence. Nevertheless, the urge to inquire and to invent has been stifled in our children (Stoddard, 1959), and heavy reliance has been placed on the results of standard intelligence tests even though admittedly these tests do not measure creative ability.

In discussing this educational problem, Taylor and Barron (1963) have stated that the initial problem is the early identification of creative

talent, or creative potential, as this talent would be more accurately described in the young child. When such identification is possible, a study of factors which strengthen or stifle creative ability can be initiated.

The purpose of the present research is to develop an instrument for the measurement of originality which is recognized as an important factor in creative ability. To the extent that such an instrument may be used in the early identification of creative potential, this research is seen as a contribution to the study of the nature and development of creative ability.

Procedure

The following steps were involved in the development of an instrument for the measurement of originality in preschool children.

1. The literature was reviewed to gain an understanding of originality as an intellectual characteristic, and an understanding of the methods that have been used to measure originality and the problems that have been encountered in its measurement.
2. Pilot work was done to clarify the criteria for the instrument.
3. The instrument was developed.
4. The instrument was administered to 80 children of preschool age.
5. The data were analyzed.
6. The results were interpreted and recommendations were made for future use of the instrument.

CHAPTER II

REVIEW OF LITERATURE

Introduction

Originality is accepted as a measurable intellectual characteristic of the creative person. Many writers state or imply that originality is possessed by everyone to some degree but that some persons have a greater abundance of this ability than others (Guilford, 1962a, Taylor, 1959, Torrance, 1963). Barron (1955, 1963) speaks of originality as a continuum, with individuals who never depart from the stereotyped and conventional in their thinking at one extreme and individuals who are habitually original at the other extreme. The latter are represented by the inventive geniuses, who may be remembered for only a few ideas or products, but whose biographies indicate a lifetime of original thinking.

Originality is a measurable, intellectual characteristic but it is not to be confused with the intellectual ability measured by standard intelligence tests. Guilford (1962b, 1963) in his study of the Structure-of-Intellect, found originality to be an intellectual factor requiring a great deal of divergent thinking. Guilford defined divergent thinking as the generation of information from given information, when the emphasis is upon variety and quantity of output. Contrasted to this is the convergent thinking which is required in standard intelligence tests. This type of thinking is defined as the generation of information from given information, when the emphasis is upon achieving the conventionally accepted

best outcomes.

Ways of Measuring Originality

In research tasks, originality has usually been identified by judges' opinions or by the statistical infrequency of responses. The assumption underlying the use of statistical infrequency is that uncommon or unusual responses are those occurring least frequently among the responses of all subjects in a given population. Judges' opinions have been used to determine such qualities as cleverness, flexibility, and remoteness of association, as well as originality, per se.

Several methods of scoring originality are employed in the Unusual Uses Test developed by Guilford. In this test, the subjects list as many uses as possible for common stereotyped objects as a brick, a paper clip, or a newspaper; and the least commonly mentioned responses, i.e., the statistically infrequent, are accepted as the most original. Fluency is indicated by the quantity of responses, i.e., a numerical count, and flexibility is indicated by the variety of responses, i.e., judges' opinions of quality. Getzels and Jackson (1962) and Torrance (1962) used this same test or adaptations of it in their studies of young adults and school children.

In Torrance's study of school children from the first through the sixth grade, he used originality, determined by statistical infrequency, as one of the indicators of creative ability. His study included tasks such as Picture Construction, Product Improvement, and Incomplete Figures. In these tasks, as in the Unusual Uses Task, the originality of the responses was determined by statistical infrequency. This same method of scoring was employed by Andrews (1930) in her study of imagination in

preschool children. Her subjects responded to line drawings which ranged from reproductions of familiar objects to schematic representations of dots and lines. The least frequently mentioned response was accepted as the most original.

In the above studies, originality was defined in terms of the statistical infrequency of the response. When broader aspects of originality are considered, judges' opinions are needed. Torrance (1963) stated that in addition to being statistical infrequent, the response which indicates originality is relevant to the task, shows intellectual strength, and represents some break away from the obvious and the commonplace. These aspects of originality are not measured by statistical frequency.

Judges' opinions are used in Guilford's Consequence Test, in which the least obvious response is accepted as the most original, and in his Plot Titles Test, in which the most clever response is accepted as the most original. Also, in The Turney Designs (Barron, 1963), mosaic constructions are judged for originality and for artistic design. In studies of the imaginative behavior of preschool children (Andrews, 1930, Markey, 1935), trained observers were used to judge the children's behavior in play situations, such as housekeeping. Similarly, trained judges are used to score the responses on projective tests designed to measure originality.

Problems in the Measurement of Originality

In various studies of originality, specific problems have occurred in relation to the operational definition of originality, the research design, and the validity of the findings. Problems in these areas which have particular significance for the present research will be discussed here.

Definition of Originality

In some studies, originality is defined in terms of the new or novel. The question of what is new or novel still remains. A response may be new for the particular individual responding, or it may be new for the total group of subjects. In the study of imagination in preschool children (Andrews, 1930), a response was accepted as original if it was novel for the particular child responding; i.e., if it was unlike other responses made by that particular child. Such a response would be statistically infrequent when compared to all the responses of this one child. In most research, a response is considered original if it is novel or uncommon when compared to the responses made by a group of subjects. These two approaches indicate that a response may be judged as original by its statistical infrequency when the responses of one individual are considered or when the responses of a group of individuals are considered.

In theoretical discussions, reference has been made to the influence of past experiences on creative expression. In his definition of the creative process, Carl Rogers (1959) recognized not only the creative ability within the person, but also the effect of the materials, events, people, and circumstances of the life of that person on his creative process; and Thorndike (1959) has stated that past experiences, on the whole, provide the material for invention.

Past experiences and specific training do influence a subject's responses on tests of originality. For example, in the Product Improvement test (Torrance, 1962), girls responded more freely with ideas for improving a nurse's kit while the boys came forth with more ideas for improving a fire engine. In a cross-cultural study of originality (Torrance, 1963), the influence of past experience was also apparent. The subjects

in the study were school age children from six different cultures (United States, Australia, Western Samoa, Germany, India, and segregated Negro schools in Georgia). Many of the children's responses were common to all cultures; however, some responses which were statistically frequent in one culture were infrequent in another.

A similar cultural influence was found in a study of imagination in adults (Dearborn, 1897). In an inkblots tests, a domestic woman was reminded most often of domestic objects while an artist was reminded of more picturesque and fanciful things.

All of these studies were done with school age children or adults. With still younger children, this problem, i.e., the influence of specific training or experiences on responses to a test for originality, would be even more serious. Older children have school and community experiences in common, whereas the child of preschool age is influenced primarily by the culture of his own home which may be radically different from that of another child in the same community. Thus, one child's response, which seems unusual when compared to the responses of other children, may not be original or novel for that particular child.

Preliminary Experience

Preliminary experience or a warm-up session before the actual research testing, has been one method used to establish rapport. Maltzman (1960) used a word association task as a session before a test of originality. A list of words was presented to the subject five times and he was encouraged to think of different associations each time. Maltzman found that subjects who had this preliminary experience produced more original ideas or solutions to test problems, which included practical

real-life problems, than did those subjects who had no preliminary experience.

Cunnington and Torrance (1962) found preliminary experiences to be one of the most important aspects of their Sounds and Images Test. In this test the subjects wrote word pictures of sounds they heard. The warm-up session gave the subject an opportunity to get out of his system the most common and obvious responses; it helped release him so that he could use his imagination; and it invited divergent thinking "just for fun" without the threat of evaluation.

Suitability of the Task for a Particular Age Group

Markey (1935) recognized the problem of verbal communication when studying the imaginative behavior of young children. She advised the use of materials with which the child could actually play, in order that manipulative responses, as well as verbal responses, be included in the task. She recommended that more than one method of testing be used with young children.

Markey also found that certain tasks were more suitable for the younger preschool children than the older. For example, free play with housekeeping materials seemed to be less interesting to the older children in her study. She credited an apparent decrease in imagination at age five to this disinterest rather than accepting the decrease at face value.

Validity

Proving the validity of tests designed to measure an ability or a potential frequently presents a problem. Time may prove a test to be valid if the ability or potential has not been stifled in the meantime.

Longitudinal studies are needed for this type of validation; however, for many research instruments, validation by means of longitudinal studies is impractical.

"Face validity" is often accepted if the test is focused directly on the kind of behavior in which the investigator is interested. The underlying assumption is that the behavior which appears to be involved in the test is the behavior which the test actually measures. For example, a child's tendency to conform may be measured by his choice of conforming rather than nonconforming responses in a test situation. Many instruments designed to measure originality have been accepted as having "face validity". This has been particularly true when the statistical infrequency of a response has been used to indicate its originality.

Judges' opinions have also been used to determine test validity. However, judges' opinions may be biased; and this method of validation has been questioned in the literature. Gronlund (1950) studied the accuracy of teachers' judgments of the acceptance of sixth-grade pupils by their classmates. He found that teachers differ in the accuracy of their judgments. Correlations between the sociometric status of the pupils and the teachers' judgments ranged from .268 to .838. Gronlund also found a tendency for teachers to over-judge the sociometric status of pupils whom they prefer and to under-judge the status of pupils whom they least prefer. Alexander (1953) studied teachers' judgments of their pupil's intelligence and found the teachers to be correct less than 60% of the time in their selection of the pupils with the highest and lowest intelligence.

Implications for the Present Study

Implications for the present research can be drawn from the methods

of studying originality reported in the literature and from the specific problems which have been encountered in relevant studies.

1. When an original response is defined as an uncommon or novel response, statistical infrequency, as a method of scoring, is more objective than judges' opinion.

2. Past experiences may be controlled if a method of scoring is devised in which each child is compared to himself rather than being compared to the total group being studied.

3. A warm-up session is advisable in order that the child fully understand what is expected and be able to work to the best of his ability.

4. The specific task used in the research should have inherent interest for the age group with which it is to be used.

CHAPTER III

DEVELOPMENT OF THE INSTRUMENT

This chapter will include (1) a description of the pilot work which helped to clarify the criteria for the research instrument; (2) a description of the research instrument, its administration and scoring; (3) a description of the subjects who participated in the research; and (4) recommendations for the analysis of the data.

Pilot Work

Pilot work for the development of an instrument with which to measure originality in preschool children was begun with a study of the tasks developed by Torrance (1962), tasks which were designed for use with school age children. A study of these tasks was undertaken to determine whether they could be adapted for use with preschool children.

Step 1. In the first step of the pilot work, six incomplete line drawings were shown, one at a time, to approximately 15 children, ages three through five. Each child was encouraged to finish the drawing and to respond verbally. The children wanted to draw, but their verbal responses and their drawings had no relationship to the line drawings that were presented to them. These observations indicated that line drawings were inappropriate for the young children.

The problem of judging the originality of a child's response was also obvious in this initial study. Some of the children gave unique responses,

in that no other child gave the same response. However, these unique responses were frequently the result of a recent interesting experience that was uppermost in the child's mind. Under such circumstances, a child would tend to repeat the same "unique" response even though no other child gave this particular response. (Further evidence of the influence of recent experience appeared in later pilot work when the children named seasonal objects such as cantaloupes in late summer and Christmas decorations in December.)

This pilot work suggested the advisability of (1) using three-dimensional forms rather than line drawings, and (2) scoring the responses by comparing each child to himself rather than comparing him to the total group being studied.

Step 2. The purpose of this step in the pilot work was to test the effectiveness of three-dimensional forms with preschool children. Several materials (wood, cardboard, clay, aluminum foil, styrofoam, and construction paper) were made into various shapes and designs and shown to fifteen different children who were encouraged to tell what the forms might be. The children enjoyed manipulating these and responded with a greater variety and number of ideas than to the line drawings. Some rather complex forms prompted detailed responses from all children and therefore provided no means of discriminating among the children. This suggested that the forms should be very simple if originality is to be objectively determined by the statistical infrequency of responses.

Step 3. The purpose of this step of the pilot work was to develop a method of presenting the same shape to the child several times to determine whether statistical infrequency could be used as a scoring method without comparing one child's response to those of other children.

Twelve different styrofoam forms were made and shown to several children. The five shapes to which these children gave the greatest variety of responses were chosen for use in this step of the pilot work. Five sets of these shapes were made and each set was painted or was covered with textured paper. The children were then shown one set at a time and their responses recorded. Most of the children became disinterested before all five sets were presented. Some children gave the same response to one shape each time it was presented even though the color or texture was different. Others gave a variety of responses. The children noticed the different colors but were indifferent to the textures, except for aluminum foil. Several children reacted to the foil by asking if they should unwrap those pieces.

This step in the pilot work indicated that statistical infrequency could be used to judge originality without comparing one child's responses to those of other children. This could be done if several sets of three-dimensional forms were presented to each child, the sets being identical except for color. The child who gave the greatest number of different responses would be accepted as the most original.

Step 4. In the next step of the pilot work, ten different forms were used. Two sets of these forms were made of styrofoam; one set was painted red and the other was painted blue. The child was shown one pair of identical forms at a time. One of these was placed on the table in front of the child and the other in front of the experimenter. The child was asked what his form could be; and then after he responded, he was asked what the experimenter's could be. In this same manner, all ten pairs were presented to the child. The entire set was then repeated with the child being given the opposite color; that is, if the red forms had been placed in

front of the child during the first administration, the blue forms were placed in front of him during the second. With this repetition of the entire set, the children responded four times to each form and their interest was maintained.

The need for a warm-up session was again indicated by the fact that one child in particular was reluctant to respond during the first administration, but responded rather freely during the second.

Step 5. In this step of the pilot work, a warm-up session was introduced. Six white styrofoam forms were offered to the child. These were presented simultaneously and the child was encouraged to manipulate them and to talk about them. Arbitrarily, a decision was made that the child would be considered ready for the research task, when he had suggested at least four different ideas when asked what the forms might be.

Approximately ten children were used in this step of the pilot work and all responded freely to the research task after the warm-up session. Even so, the task did discriminate among the children; some were able to think of more ideas than others.

The Research Instrument

Criteria

The review of literature and the pilot work clarified the following criteria for the research instrument:

1. The materials used should be of inherent interest to preschool children.
2. A warm-up session should precede the administration of the instrument in order that the child fully understand what is expected and be able

to work to the best of his ability.

3. The design should provide opportunity for a method of scoring which would permit the evaluation of one child's responses without comparing him with other children.

4. The actual scoring should be objective, as far as possible, rather than being dependent on judges' opinions.

5. The total number of possible responses should be sufficient to provide opportunity for discrimination among children of varying degrees of originality.

Description of the Instrument

The instrument consisted of different shaped pieces of styrofoam ranging in size from a ball two inches in diameter to an irregular piece four inches by six inches. For the warm-up session six pieces of white styrofoam were used. These are pictured in Figure 1. For the research instrument, two identical sets of ten different styrofoam forms were used. One set was painted red and the other set was painted blue. These are pictured in Figure 2.

Administration of the Instrument

For the warm-up session, all six white forms were placed on the table in front of the child. (See Figure 3.) The child was encouraged to manipulate them and to talk about them. He was asked, "Do you see a piece that looks like something? Or could we make it into something?" When the child responded, the experimenter agreed with his comment, whatever it was, and encouraged him to talk about another form. If the child did not respond, the experimenter picked up one of the forms and asked what that particular piece might be. If the child still did not respond, the

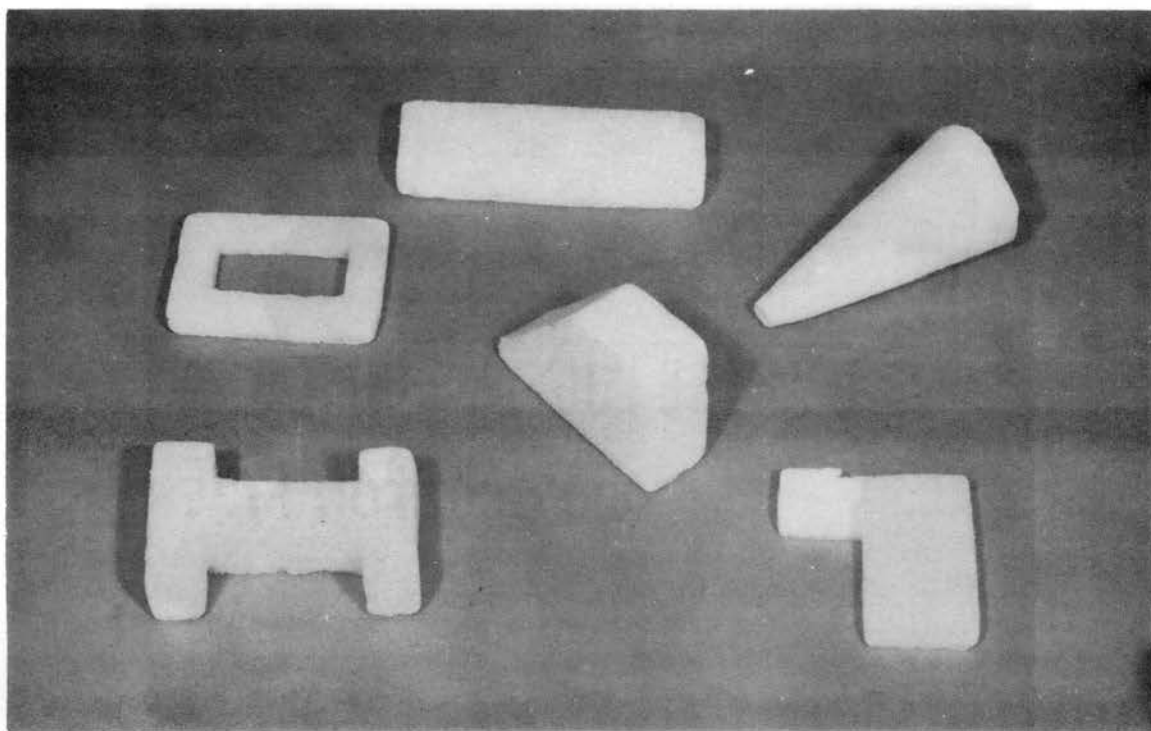


Figure 1. Forms used in the Warm-Up Session

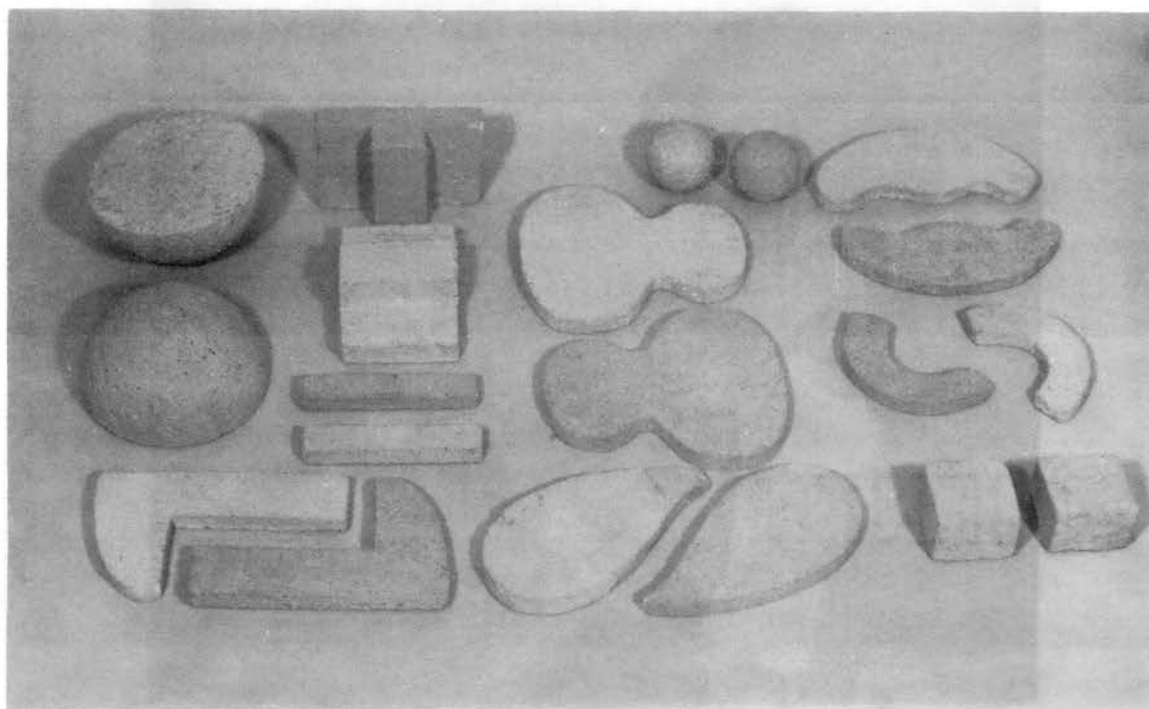


Figure 2. Forms used in the Research Instrument



Figure 3. Administration of the Warm-Up Session



Figure 4. Administration of the Research Instrument

experimenter made a suggestion in the form of a question, e.g., "Do you think it could be a window?" If the child gave the same response for different shapes, his response was accepted, but he was asked to think of something else that it could be. For example, if the child said that two different pieces could be a door, the experimenter said, "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 had responded to each of the six forms, the experimenter praised him by saying, "Good, you thought of something different for all those pieces."

Arbitrarily, as decided during the pilot work, no child was considered ready for the research task unless he had responded with at least four different ideas during the warm-up session.

The research instrument was administered by showing the child one pair of identically shaped pieces at a time. (See Figure 4.) When he was shown the first pair, he was given his choice of the color he preferred, red or blue. The one he chose was then placed on the table in front of him and the other was placed in front of the experimenter. The child was then asked what his piece could be or what it could be made into. After he responded, he was then asked what the experimenter's piece could be. For the first pair, and occasionally during the remainder of the test, the experimenter included the child's response in his next question, "If yours is a (caboose), then what could mine be?" This wording reminded the child to think of a different response for each piece. Approval of each response was given by saying something such as "All right," or "It certainly could be". Whether or not the child gave different responses, his efforts were approved in this same manner.

When all ten pair of styrofoam forms had been shown to the child,

the entire set was again presented. This time the child was given the opposite color, the one he had not chosen during the first administration. Also, the forms were presented in different positions, e.g., sideways, upside down.

Scoring

The combination of the two administrations of the research instrument offered four opportunities for a child to respond to each form, making a total of 40 responses. Each child's score was a numerical count of the number of different responses he gave. Inasmuch as there were only ten different forms, each presented four times, the child who lacked originality might be expected to give the same response each time a particular form was shown to him; whereas, an "original" child might give as many as 40 different responses.

The directions for scoring were designed to give the child credit for each different response that he made. The responses were scored in the order in which the child gave them, and credit was given for each response which was different from all previous responses. Credit was given for objects which might be in the same category, such as a golf ball and a base ball. Credit was not given for an object which was named a second time and altered only by a minor adjective, such as a ball and a big ball. No credit was given for a play on words, such as kigless, pigless and sigless.

One problem encountered in the scoring was that a few children sometimes responded by naming objects they could see in the room. This was noted on the score sheet and, in these instances, credit was given only if the experimenter could see some relationship between the response and the styrofoam form which the child was holding.

Explicit scoring directions and copies of two children's score sheets are presented in Appendix B.

Subjects

The subjects were 40 girls and 40 boys of preschool age, all of whom were in attendance at day care centers, nursery schools and kindergartens. The age range of the children was from three years six months to five years eleven months. The children were equally distributed throughout this range with four boys and four girls in each quarter year, making a total of 16 three year olds, 32 four year olds, and 32 five year olds. No child who participated in the pilot work was included in the final study.

Recommended Analysis

The analysis of the data should include tests of the reliability of the instrument and the reliability of the scoring, some measure of the validity of the instrument, and a descriptive analysis of age and sex difference in the group of children who participate in the research.

The following analyses are recommended:

1. The reliability of the scoring of the children's responses should be determined by correlating the scores of a "naive" judge with the scores determined jointly by two persons familiar with the research task.
2. The reliability of the instrument should be determined by a split-half correlation.
3. The validity of the instrument should be determined by an analysis of teachers' judgments of children demonstrating high and low originality on the research task.
4. The data should be analyzed for age differences in originality.
5. The data should be analyzed for sex differences in originality.

CHAPTER IV

RESULTS

A research instrument for the measurement of originality in young children has been developed and administered to 80 children of preschool age. The scores of these children have been analyzed to determine inter-judge reliability, the reliability and the validity of the instrument, and age and sex differences in originality. These analyses will be presented in this chapter. The scores of the individual children who participated in the research are presented in Appendix A.

Inter-Judge Reliability in Scoring

The response of the individual children were scored jointly by the experimenter and a co-worker both of whom had participated in the development of the instrument. This joint scoring was done in order that any problems in the scoring directions could be clarified. A third person trained in Child Development but unfamiliar with this research was then given the explicit directions for scoring (see Appendix B) and scored the data independently. Inter-judge reliability was determined by a comparison of these two sets of scores.

The coefficient-of-correlation (Pearson product-moment) between the two sets of judges' scores was $+ .989$, which is significant beyond the .01 level. In view of these findings, the directions are accepted as adequate and their use should assure reliable scoring.

Reliability of the Instrument

The reliability of the instrument was determined by a split-half correlation. The sums of alternate responses were used in this analysis; specifically, the sum of the odd responses in columns A + B and the even responses in columns C + D was correlated with the sum of the even responses in columns A + B and the odd responses in columns C + D. This scoring is illustrated on the sample score sheets in Appendix B.

A split-half analysis, using the Spearman-Brown formula, yielded a correlation of + .932 ($p < .01$), indicating that the instrument has reliable internal consistency.

Validity of the Instrument

The question of whether the research instrument is measuring originality, which it claims to measure, can be answered affirmatively if one accepts "face validity". An original response has been defined as one which occurs infrequently in a group of responses. In line with this definition, the child who repeated his responses on the originality task, and therefore gave fewer different responses, would be less original than the child who gave many different responses.

The use of teachers' judgments to rank the children from most to least original, was rejected as a test of validity because such judgments are susceptible to bias. Nevertheless, teachers probably are in one of the best positions to judge children; therefore, a modified ranking system was devised which would make use of the teachers' knowledge of the children and yet prevent a bias toward one child from distorting the rank scores of other children.

In each of five children's groups (day care, kindergarten and nursery

school) in which the originality task was administered, every child who scored high (21 or more) was paired with every child who scored low (15 or less). Then the head teacher in each group was given the paired names of her children and was asked to indicate the child who was the more original of the two.

Of 153 pairs of names, the teachers' judgment was in the direction of the originality score in 106 pairs. A Chi-square analysis indicates that this extent of agreement is statistically significant. ($\chi^2 = 22.752$; $p < .001$)

Sex Differences in Originality

The number of boys and girls who scored high (25-38), medium (16-24), and low (9-15) on the originality task is presented in Table I. A Chi-square analysis of these data indicated that there was no sex difference in the responses to the originality task. ($\chi^2 = 2.257$; n.s.)

TABLE I

NUMBER OF CHILDREN, BY SEX, SCORING HIGH, MEDIUM AND LOW ON A
RESEARCH TASK DESIGNED TO MEASURE ORIGINALITY
IN PRESCHOOL CHILDREN

	Boys	Girls	Total
High Score (25-38)	13	16	29
Medium Score (16-24)	14	8	22
Low Score (9-15)	13	16	29
Total	40	40	80

$\chi^2 = 2.257$; not significant.

Age Differences in Originality

The number of children in each of three age groups who scored high (25-38), medium (16-24), and low (9-15) on the originality task is presented in Table II. A Chi-square analysis of these data indicated that older children gave a significantly larger number of original responses than did the younger children. ($\chi^2 = 17.39$; $p < .01$.)

TABLE II

NUMBER OF CHILDREN, BY AGE, SCORING HIGH, MEDIUM AND LOW ON A
RESEARCH TASK DESIGNED TO MEASURE ORIGINALITY
IN PRESCHOOL CHILDREN

(Ages are expressed in years and months)

	Age Groups		
	3-6 to 3-11	4-0 to 4-11	5-0 to 5-11
High Scores (25-38)	2	8	19
Medium Scores (16-24)	4	9	9
Low Scores (9-15)	10	15	4
Total	16	32	32

$\chi^2 = 17.39$; $p < .01$.

Summary

A research task for the measurement of originality in preschool children was developed and administered to 40 boys and 40 girls who ranged in age from three years six months to five years eleven months. The scoring method for the research instrument was reliable as indicated

by a correlation of two sets of judges' scores. Adequate internal consistency of the instrument was indicated by the results of a split-half correlation. A modified paired-comparisons analysis using teachers' judgments substantiated the validity of the instrument. No sex differences were found in the responses of preschool children to the task. Age differences were evident; the older children gave a significantly larger number of original responses than did the younger children.

CHAPTER V

SUMMARY AND CONCLUSIONS

The purpose of this research was to develop an instrument for the measurement of originality in preschool children. Such an instrument was developed and proved successful in discriminating among the children who were used as subjects. These subjects were 80 boys and girls equally distributed between ages three years six months and five years eleven months.

The instrument was composed of styrofoam forms made into different shapes. Six white forms were used in a warm-up session during which the child was encouraged to manipulate and talk about the forms. The research instrument was composed of two identical sets of ten different forms; one of these sets was painted red and the other was painted blue. The child responded to one pair of like forms at a time by first telling what the piece he held could be, and then telling what the piece the experimenter held could be. The ten different forms were presented in this manner and then the entire procedure was repeated with the child and the experimenter receiving alternate colors, making a total of 40 responses. Each child's score for originality was a numerical count of the number of different responses he gave, with high scores indicating the more "original" children.

Inter-judge reliability of the scoring method was determined by a comparison of two sets of judges' scores. The internal consistency or reliability of the instrument was determined by a split-half correlation,

and the validity of the instrument was substantiated by using teachers' judgments in a modified paired-comparison analysis.

There were age differences but no significant sex differences in originality as measured by this research task. The older children were more original than the younger children.

Implications for Future Research

During the present study, certain tendencies were noted which suggest possibilities for future research.

1. No significant sex differences were found in the study. However, the sum of the scores for all the boys was slightly higher than the sum of the scores for all the girls. The sums of the scores at different ages indicated that the younger girls had higher scores than the younger boys; but this relationship between boys and girls was reversed with the older children. This suggests that a more detailed study of sex differences in originality is advisable.

2. Most of the children merely named objects which the forms might be; a few gave elaborate explanations of the way the forms could be modified. For example, with Form No. 7, which many children called a "drop of water", one child elaborated, "You could put a candle under here, and this up here, and it would be a flame on the candle." These elaborate responses were given only by children who earned high scores; but all children who scored high were not this elaborate. This suggests that a method of measuring the quality of the responses might discriminate among the children who seem highly original as indicated by scores on the present instrument.

3. Five year old children were more original than three and four

year old children as measured by the present research instrument. Torrance (1963) suggested that there was a drop in originality at age five; but such a drop was not apparent in the present study. This suggests that the research instrument developed in this study should be administered to six and seven year old children. This would serve a twofold purpose: (1) The upper age limits for the use of this instrument could be determined, and (2) a drop in originality at age six, if such exists, could be detected.

4. Methods of encouraging the development of originality might be suggested by the retest of children who participated in the present study. This would be true if the scores on the retest were generally higher due to the practice provided by the first test.

5. A study of changes in originality is desirable in order that methods of encouraging the development of this ability be appraised. For such a study, a second set of forms is needed, a set which would have reliability comparable to that of the set used in the present research.

6. In the broader study of creative ability, the relationships among various characteristics needs to be studied. In such studies, the present instrument can be used for the measurement of originality.

7. Inasmuch as there is the possibility that the present instrument measures only one aspect of originality, other instruments for the measurement of this characteristic should be developed.

SELECTED BIBLIOGRAPHY

- Alexander, A. M. "Teacher Judgment of Pupil Intelligence and Achievement Is Not Enough." Elementary School Journal, LIII (1953), 396-401.
- Andrews, Elizabeth Gordon. The Development of Imagination in the Pre-school Child. Studies in Character, Vol. III, No. 4. University of Iowa, 1930.
- Barron, Frank. Creativity and Psychological Health. New York: D Van Nostrand, 1963.
- _____. "The Disposition Towards Originality." Journal of Abnormal and Social Psychology, LI (1955), 478-485.
- Cunnington, Bert and E. Paul Torrance. "Sounds and Images: A Test of Originality and Warm-Up for Creative Activity." Bureau of Educational Research, University of Minnesota, 1962.
- Dearborn, George V. "A Study of Imaginations." American Journal of Psychology, IX (1898), 183-190.
- Getzels, Jacob W. and Phillip W. Jackson. Creativity and Intelligence. New York: John Wiley & Sons, 1962.
- Gronlund, Norman E. "The Accuracy of Teachers' Judgments Concerning the Sociometric Status of Sixth-Grade Pupils." Microfilm Abstracts, X (1950), 97-98.
- Guilford, J. P. "Creativity: Its Measurement and Development." in S. J. Parnes and H. F. Harding (editors), A Source Book for Creative Thinking. New York: Scribner's Press, 1962a, pp. 151-168.
- _____. "Three Faces of Intellect." in Warren R. Baller (ed.), Readings in the Psychology of Human Growth and Development. New York: Holt, Rinehart, & Winston, 1962b, pp. 397-418.
- _____. "Traits of Creativity." in H. H. Anderson (ed.), Creativity and Its Cultivation. New York: Harper & Brothers, 1959, pp. 142-161.
- _____, and R. Heopfner. "Current Summary of Structure-of-Intellect Factors and Suggest Tests." Reports from the Psychological Laboratory. University of Southern California, No. 30. 1963.
- Maltzman, Irving. "On Training of Originality." Psychological Review, LXVII (1960), 229-242.

- Markey, F. V. Imaginative Behavior in Preschool Children. New York: Bureau of Publications, Teachers; College, Columbia University, 1935.
- Rogers, Carl R. "Toward a Theory of Creativity." in H. H. Anderson (ed.) Creativity and Its Cultivation. New York: Harper & Brothers, 1959, pp. 142-161.
- Welltitz, Claire, Marie Jahoda, Morton Deutsch, and Stuart W. Cook. Research Methods in Social Relations. New York: Holt, Rinehart, & Winston, 1962.
- Stoddard, George D. "Creativity in Education." in H. H. Anderson (ed.) Creativity and Its Cultivation. New York: Harper & Brothers, 1959, pp. 181-202.
- Taylor, Calvin W. (ed.) Creativity: Progress and Potential. New York: McGraw Hill, 1964.
- _____. "Identifying the Creativity Individual." in E. P. Torrance (ed.), Creativity: Second Minnesota Conference on Gifted Children. Minneapolis: Center for Continuation Study, University of Minnesota, 1959, pp. 3-21.
- _____, and Frank Barron (eds). Scientific Creativity: Its Recognition and Development. New York: John Wiley & Sons, 1963.
- Torrance, E. Paul. Education and the Creative Potential. Minneapolis: The University of Minnesota Press, 1963.
- _____. Guiding Creative Talent. Englewood Cliffs, N. J.: Prentice Hall, 1962.

APPENDIX A

TABLE III

AGES AND RAW SCORES OF INDIVIDUAL BOYS PARTICIPATING IN THE DEVELOPMENT OF AN INSTRUMENT
DESIGNED TO MEASURE ORIGINALITY IN PRESCHOOL CHILDREN

(Ages are expressed in years and months)

Child	Age	Score	Child	Age	Score	Child	Age	Score
206	3-7	14	289	4-4	14	300	5-2	36
2	3-7	11	290	4-4	32	299	5-3	20
131	3-7	15	291	4-4	13	213	5-4	19
191	3-9	21	228	4-7	19	325	5-5	25
12	3-9	16	293	4-7	9	214	5-5	27
320	3-10	13	292	4-8	21	216	5-6	29
62	3-11	12	74	4-8	29	215	5-6	33
177	3-11	17	294	4-9	12	209	5-8	28
15	4-0	17	152	4-9	19	211	5-8	22
287	4-1	15	295	4-11	32	246	5-9	27
217	4-2	11	297	4-11	10	243	5-9	16
288	4-2	23	298	5-0	17	241	5-10	38
230	4-3	11	174	5-0	18	240	5-11	30
			195	5-1	30			

TABLE IV

AGES AND RAW SCORES OF INDIVIDUAL GIRLS PARTICIPATING IN THE DEVELOPMENT OF AN INSTRUMENT
DESIGNED TO MEASURE ORIGINALITY IN PRESCHOOL CHILDREN

(Ages are expressed in years and months)

Child	Age	Score	Child	Age	Score	Child	Age	Score
65	3-6	12	178	4-3	13	311	5-2	27
46	3-7	9	304	4-5	12	112	5-3	19
318	3-8	18	193	4-6	25	315	5-3	18
321	3-8	33	77	4-8	27	312	5-4	33
322	3-8	28	305	4-8	10	314	5-4	10
323	3-9	10	49	4-8	25	76	5-7	10
205	3-11	11	306	4-8	11	33	5-7	35
324	3-11	10	307	4-9	23	313	5-7	15
302	4-0	19	222	4-9	31	316	5-8	25
301	4-1	25	154	4-10	11	198	5-9	32
45	4-1	11	156	4-11	17	232	5-9	26
135	4-2	15	308	5-0	18	130	5-9	15
303	4-2	21	309	5-0	28	317	5-11	33
			310	5-0	25			

APPENDIX B

DIRECTIONS FOR SCORING ORIGINALITY TEST

- A. Score the responses in the order in which the child gave them, columns A and B together and then columns C and D together.

1A - 1B - 2A - 2B - 3A - 3B, etc.

- B. Mark each response either + for credit or - for no credit.

Mark a response +, if it is different from all previous responses.

When in doubt, give the child credit.

C. Categories of objects

1. A child may name objects which are similar in category.

The child receives credit for each different type of object in the category.

Ex: golf ball (+), base ball (+), moth ball (+)

2. A child may name the category and then name a specific object in the category.

Ex: ball (+), rubber ball (+), base ball (+)

D. Examples of no credit

1. A child does not receive credit when he combines two previous responses for which he has received credit.

Ex: tree (+), cookie (+), tree cookie (-)

2. A child does not receive credit when he names an object a second time altering it with a minor adjective.

Ex: ball (+), big ball (-), half ball (-)

Ex: duck (+), part of a duck (-)

Ex: egg (+), round egg (-), cracked egg (-)

Ex: red ball (+), blue ball (-)

3. The child receives no credit for a play on words.

Ex: Kigless (-), Pigless (-), Sigless (-)

Ex: Rigco (-), Sig-co (-)

- E. Some children look about the room for ideas. This is noted on the score sheet. For such responses, the child receives credit if there is a possible relationship between the response and the test form.

Name Child - 2Sex M

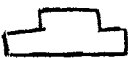


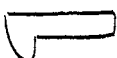






SPLIT-HALF SCORES

Date of Birth 4-16-60Age 3-7Odd A B + even C D = 6

TOTAL

Code 2Date 2-4-63Odd C D + even A B = 5

11

	A. Blue	B. Red	C. Red	D. Blue
1. 	block +	block -	block -	block -
2. 	bridge +	bridge -	bridge -	bridge -
3. 	block -	block -	block -	block -
4. 	block -	tree +	tie +	tie -
5. 	boat +	boat -	boat -	boat -
6. 	block -	tree -	block house +	block -
7. 	tear +	tear -	tear -	tear -
8. 	ball +	ball -	ball -	ball -
9. 	girl +	girl -	snowman +	snowman -
10. 	car +	car -	block -	block -

Name Child 317Sex F

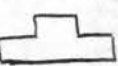


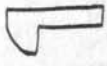






SPLIT-HALF SCORES

Date of Birth 12-11-57Age 5-11Odd A B + even C D = 15

TOTAL

Code 317Date 12-6-63Odd C D + even A B = 18

33

	A. Red	B. Blue	C. Blue	D. Red
1. 	car seat +	car seat -	chair to sit in at a park +	diving board +
2. 	tunnel +	glass house +	a "U" +	a "C" +
3. 	brick +	toy block +	big piece of brick -	suitcase +
4. 	baby buggy +	patio chair +	rocking chair +	sidewalk +
5. 	big fat hot dog +	blue see-saw +	turnpike +	curve for cars to go +
6. 	dead-end for a road +	stick for a stop sign +	a letter "I" +	board +
7. 	drop of rain +	drop of rain -	ping-pong paddle +	"I give up on this one" -
8. 	snowflake +	golf ball +	little golf ball -	ping-pong ball +
9. 	two pancakes stuck together +	eight +	squash +	pipes +
10. 	big rock +	moon +	part of a ball -	other part of a ball -

VITA

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Candidate for the Degree of

Master of Science

Thesis: THE DEVELOPMENT OF AN INSTRUMENT FOR THE MEASUREMENT OF ORIGINALITY IN PRESCHOOL CHILDREN

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