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AND RURAL STUDENTS IN OKLAHOMA

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A COMPARISON OF THE CREATIVITY OF URBAN
AND RURAL STUDENTS IN OKLAHOMA

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A COMPARISON OF THE CREATIVITY OF URBAN
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CHAPTER I

INTRODUCTION

The magnitude and the rapidity of the accumulation of knowledge during the last two decades has been so great that it could possibly be named the era of the educational revolution. If man continues to add to his present knowledge at an increasing rate, the individual who has the ability to create and discover new ideas will play an important role in the learning process. The person, who is intelligent and uses this intelligence to learn about existing knowledge, may lead a productive and useful life; however, there is evidence that the highly creative person has not only the ability to learn existing knowledge but also the ability to use his creative knowledge effectively to produce new ideas and products.

A survey of existing educational research reveals a growing amount of material dealing with creativity in many areas of productivity and learning. During this decade very few subjects have received more attention than creativity in educational literature. This increased interest has definite implications.

There is little doubt that there is no more important agency involved in education than the public schools. What part, then, do the schools play in the development of creativity? The important place creativity has taken in educational literature should to some degree focus on the cultural setting and its influence on creativity. What is the cultural influence on the public school and therefore upon creativity? While this study does not provide the answer to these questions, it does suggest that the question itself is valid and relevant.

Statement of the Problem

The problem of this study is to determine whether or not there is a difference between the creativity of urban and rural students, and to provide some insights into the nature of the effects, if any, that these differing cultural environments have upon creativity as that term is used and measured herein.

Purpose of the Study

The purpose of the study is to attempt to investigate rural and urban cultural influence upon the creativity of students. An effort to determine the significance of sex, religion, and socio-economic status as factors in the development of creativity in pupils that participated in this study is also given attention.

Delimitations of the Study

This study was limited to "creativity" as measured by five instruments chosen for this study. It involved students in grades nine through twelve attending the Canute public schools, Canute, Oklahoma, a rural school, and an equal number of students in grades nine through twelve from the Northeast Junior-Senior High School, Oklahoma City, Oklahoma, an urban school.

The five creative measures were adapted from other tests and constructed by John W. Getzels and Philip W. Jackson. They are (1) Word Association, (2) Uses of Things, (3) Hidden Shapes, (4) Fables, and (5) Make-up Problems. The measure of creativity, for the purpose of this study, is the total score a pupil makes on the five measuring instruments used.

Subjects for this study included students from Canute public schools, Canute, Oklahoma and students from Northeast Junior-Senior High School, Oklahoma City, Oklahoma. The former represented "rural" students and the latter represented "urban" subjects. Subjects participated voluntarily without urging on the part of the researcher. However, the majority of the Canute high school students (which is a small high school) actually participated.

Background of Theory and Research

Today, as in the past, educators are seeking solutions to strengthen existing educational processes and constantly searching for new educational methods and techniques that will surpass the old in producing satisfactory results in the education of the youth of America. Out of this constant evolvment have come many studies in the area of creativity. A review of the literature will immediately reveal that there is some agreement about the meaning of creativity, the characteristics of creative individuals, the identification of the creative individual by measures of creativity, and methods to develop creativity. Research in this area of human behavior has remained somewhat dormant for centuries. The research that has been done is encouraging, though the field of existing knowledge about creativity is still limited.

Numerous studies have been made of creative and talented adults, their background, and characteristics. These are people who are highly productive and successful in their life's work. Typical of these investigations are the studies of Cattell. He studied great men who lived during the period 600 B. C. to 1800 A. D.¹ and classified them as men of action, men of thought, and men of feeling. In his studies, he concluded that the major factors leading to success are endowment

¹J. McK. Cattell, "Statistical Study of Eminent Men," Creativity and the Individual, ed. Morris I. Stein and Shirley J. Heinze (Glencoe, Ill.: The Free Press, 1960), pp. 367-69.

at birth and environmental influences.¹ The men of action outnumbered the other two groups. R. H. Knapp and G. J. Greenbaum have made contributions in this general area. These studies were made with people who were outstandingly productive.

The study, by Lorge and Hollingworth,² of the experiences of children and adolescents who were classified as geniuses by means of an I. Q. score found that individuals who had I. Q.'s of 180 plus received many more honors and prizes and higher test scores at maturity than those who had I. Q. from 140-160. L. M. Terman,³ Phyllis Greenacre,⁴ Anne Roe,⁵

¹J. McK. Cattell, "The Scientific Men of the World," Creativity and the Individual, ed. Morris I. Stein and Shirley J. Heinze (Glencoe, Ill.: The Free Press, 1960), p. 375.

²I. Lorge and Leta S. Hollingworth, "Adult Status of Highly Intelligent Children," Creativity and the Individual, ed. Morris I. Stein and Shirley J. Heinze (Glencoe, Ill.: The Free Press, 1960), p. 119.

³L. M. Terman, "The Intelligence Quotient of Francis Galton in Childhood," American Journal of Psychology, XXVIII (April, 1917), 209-15.

⁴Phyllis Greenacre, "The Childhood of the Artist. Libidinal Phase Development and Giftedness," Creativity and the Individual, ed. Morris I. Stein and Shirley J. Heinze, op. cit., pp. 116-19.

⁵Anne Roe, "Early Differentiation of Interest," Ibid., pp. 119-20.

Catharine Cox,¹ and Barbara S. Burks² did studies in this area.

A study of the nature of belief systems and personality systems as related to creativity was made by Milton Rokeach. This study explored the relation between belief systems and cognitive processes. The findings suggest that the organizing principle which classifies people into belief systems is far more important than such categorizations as race or ethnic grouping in determining our relations with others.³

The highly creative student, in general, has received less favorable evaluational comments by authoritative sources than the student with a high I. Q. and less creativity. Getzels and Jackson's study⁴ of creativity and intelligence (which included analysis of student performance and personal values, how his teachers evaluated him, and family and home environment) has contributed what seems to be a valid comparison of the highly creative and high I. Q. students. Further, the study points out that the high I. Q. student is enjoyed

¹Catharine M. Cox, "The Early Mental Traits of Three Hundred Geniuses," Ibid., pp. 128-33.

²Barbara S. Burks, Dorothea W. Jensen, and L. M. Terman, "The Promise of Youth: Follow-up Studies of a Thousand Gifted Children," Ibid., pp. 133-35.

³Milton Rokeach, The Open and Closed Mind (New York: Basic Books, Inc., 1960), p. 391.

⁴Jacob W. Getzels and Philip W. Jackson, Creativity and Intelligence: Explorations with Gifted Students (New York: John Wiley & Sons, Inc., 1962), p. 36.

by teachers more than the highly creative student, although the highly creative student may be doing better scholastically than is expected of him and the high I. Q. student is doing only what is expected of him scholastically. Torrence¹ found teachers rated the high I. Q. students more courteous, hard-working, and conformitive to accepted behavior than the highly creative students. As a result of these studies, it seems that teachers consider obedience, courtesy, willingness to work, and popularity among peers, more important than courageousness and independent judgment.

J. P. Guilford, Calvin W. Taylor, Paul E. Torrance, J. W. Getzels, and Philip W. Jackson are prominent among authorities who have studied traits, worked with experimental evaluative instruments, and compared I. Q. cognitive processes with creative cognitive processes. These studies have produced a more acceptable definition of creativity; however, an evaluation of existing studies reveals the processes involved in creativity and existing experimental evaluation instruments have not filled the needs in this area. Guilford² has described the creative person as an individual who exhibits behavior such as inventing, designing, composing, and planning to a marked degree. Torrance³ has listed curiosity, imagination, discovery, innovation, and invention as prominent

¹Paul E. Torrance, "Are There Tops in Our Cages?", American Vocational Journal, XXXVIII (March, 1963), 20-22.

²Ibid., p. 21.

³Ibid.

concepts when defining or discussing the meaning of creativity. According to Taylor,¹ Guilford listed sixty-one intellectual talents as well as descriptions of the potential number of intellectual talents which approximately double the number. Since standardized I. Q. tests measure only six to eight intellectual talents, it is obvious that intelligence tests will not measure creativity. Torrance defines the tests to measure creativity used at the University of Minnesota as tests that measure non-verbal tasks, verbal tasks using non-verbal stimuli, and verbal tasks using verbal stimuli. Rokeach used the F Scale designed to measure prejudice and personality predispositions toward a fascistic outlook on life, and the Opinionation Scale designed to measure general intolerance in his study of the "open and closed mind." Five creative measures used by Getzels and Jackson in their study of creativity and intelligence are word association, uses of things, hidden shapes, fables, and make-up problems.

It is evident that the studies made to date only scratch the surface of a field of knowledge that is of the utmost importance to the growth of man's knowledge and potential accomplishments. These studies and experimental measuring instruments can be of tremendous value to broaden present knowledge of creativity as each instrument is improved.

¹Calvin W. Taylor, "Many-Sided Intelligence," Childhood Education, XXXVIII (April, 1963), p. 365.

The value of the exceptionally creative person to himself and the American democratic society cannot be over-emphasized. Since the public school systems of America play a vital part in the education of American children, it seems as though more research evaluating the public school system as a cultural influence upon the creativity of students is greatly needed.

Definition of Terms

Creativity, as it is used in this study, is not necessarily a measure of intellectual ability as measured by intelligence tests or the ability to reconstruct the known. It is the ability to reconstruct the known and construct the unknown that is based upon a variety of responses rather than a single correct response to a question or stimulus.

A Rural Student is a student who lives in a town that has a population less than 2500 or lives on a farm or ranch and attends a high school that has an enrollment of less than 300 pupils.

An Urban Student is a student who lives in a town or city that has a population of more than 2500 and attends a high school that has an enrollment of more than 300 pupils.

Cognitive Process is the act of an individual obtaining knowledge of an idea, a quality, or an object.

The Hypothesis Stated

The basic null hypothesis which this study pursued as well as sub-hypotheses may be stated as follows:

There is no significant difference between the creativity of rural and urban students.

Sub-hypotheses:

1. There is no significant difference in the creativity of students with different religious preference.
2. There is no significant difference in the creativity of students of different sex.
3. There is no significant difference in the creativity of students with different socio-economic backgrounds.

Procedures of the Study

The population of the study included eighty-seven pupils in grades nine through twelve attending the Canute public schools, Canute, Oklahoma, a rural school, and a corresponding number from the Northeast Junior-Senior High School, Oklahoma City, Oklahoma, an urban school.

1. All students in grades nine through twelve attending the Canute public schools were selected as the rural students. They were given a standardized intelligence test. This test was selected because it was the same test that had previously been administered to the urban students and was a part of their cumulative records.
2. A group of students equal in number to the rural students was selected from the Northeast Junior-Senior High School, Oklahoma City, Oklahoma, an urban school. The students were selected by pairing them with the rural students on the basis of (1) intelligence test results, (2) age, (3) sex, and (4) grade classification.

3. Five creative measures, (1) Word Association, (2) Uses of Things, (3) Hidden Shapes, (4) Fables, and (5) Make-up Problems, were administered to the population of this study and a data sheet, to determine the socio-economic background of the students, was filled in by each subject.
4. The creative measures were evaluated and scored according to the instructions given by the authorities who constructed the measuring instruments.
5. The variables tested were (1) the comparison of subject scores between the two sexes, (2) the comparison of subject scores with different religious preferences, and (3) the comparison of subject scores based upon socio-economic background.
6. The test score data was subjected to the proper statistical tests to determine whether there is a significant difference in the creativity of rural and urban subjects and to determine the significance of the variables.
7. Conclusions and recommendations were formulated on the basis of the results.

Organization of the Study

The report of this study includes five chapters. Chapter One states the problem, gives the purpose of the study, presents the delimitations and background of theory and research of the study, defines the major terms, states the hypotheses, and introduces the procedures of the study and gives the organization of the study. Chapter Two deals with the understanding of creativity. Chapter Three explains the design of the study and describes the instruments and procedures used to collect the data. Chapter Four interprets the data through statistical analysis, tables, and discussion. The fifth chapter gives conclusions and makes recommendations.

The appendixes include instruments that were used to measure creativity, a data sheet that was filled out by each subject, and the scores made by the subjects.

CHAPTER II

A REVIEW OF SELECTED RESEARCH AND LITERATURE

Introduction

A review of selected research indicated that authorities are attempting to learn all the facts relating to creativity. According to Lawrence,¹ psychologists have been trying to develop instruments to evaluate creativity since 1898, attempting to use creative measures to supplement intelligence tests in identifying intellectual talent, and recommending changes in education that would enhance development of one of the most valuable human assets, creative talent.

Authoritative research in the area of creativity includes (1) attempts to define creativity, (2) efforts to identify characteristics of the creative person, (3) research projects and creative concepts that have been the result of recent research, (4) development of instruments to measure creativity, and (5) studies to identify methods to develop creativity in the individual. Research indicates that creative talent is not always recognized, and very little is

¹Paul W. Lawrence, "Essay Review: Creativity and Intelligence," The School Review, LXXI (Spring, 1963), 112.

being done to strengthen and develop creative talent in the average school child.

Attempts to Define Creativity

While there is not unanimity in the efforts to define creativity, authorities seem to agree that creativity involves more than the ability measured by mental maturity tests, that it is possessed to some degree by all people, and that it is the ability to produce original ideas from the known and from the unknown or seemingly unrelated facts and factors.

Although a certain amount of intelligence is needed to produce creativity, Torrance estimates that if I. Q. tests were used as instruments to measure creativity, only about seventy per cent of the creative children would be identified. He identifies "creative thinking as the process of sensing gaps or disturbing, missing elements; forming ideas or hypotheses concerning them; testing the hypotheses; and communicating the results, possibly modifying and retesting the hypotheses."¹ Torrance² evaluates creative learning, which is man's fundamental way of learning, as involving exploration, manipulation, modifying ideas. Creative learning uses abilities of evaluation, divergent thinking, and redefinition. The continuity of thought in this author's efforts to define

¹Paul E. Torrance, Guiding Creative Talent (Englewood Cliffs, N. J.: Prentice Hall, 1962), p. 16.

²Paul E. Torrance, "Conditions for Creative Learning," Childhood Education, XXXIX (April, 1963), 367.

creativity emphasizes that creative thinking requires the ability to fill in the unknown after exploring and thinking through the known and unknown as a result of experimenting, evaluating, and testing that which is known and/or assumed. Creative thinking requires dissatisfaction with the status quo and the ability to turn away from the accepted toward the insecurity of the perils of the not-yet-accepted and unknown. The ability to modify previous knowledge and create nonexisting thoughts and knowledge are valuable avenues to creative thinking. Getzels and Jackson¹ evaluate the factors of creativity and intelligence as two intellectual or cognitive modes. One mode is based upon learning that which has been previously determined and retaining that which is already known. The other mode, which is intellectual innovation and inventiveness, is based upon exploring that which has not been determined, revising that which is known, and constructing that which might exist but is not known. If the second mode is assumed to describe creativity, then it cannot be measured by an intelligence test. It is evident that the ability to perform tasks that involve conformity to this definition requires existing knowledge and intelligence; however, knowledge and intelligence are not adequate to function satisfactorily and produce the desired results. "Creativity may be thought of as the capacity to recombine and express old

¹Getzels and Jackson, pp. 13-14.

experiences in a new way, and generally involves unusual sensitivity and spontaneity."¹ Guilford says "A creative pattern is manifest in creative behavior, which includes such activities as inventing, designing, contriving, composing, and planning."² This behavior should be exhibited to a marked degree to be considered creative. The ability to produce new ideas and new materials from existing ideas and materials is creative behavior according to the above definitions.

Creative ability does not mean that the child must produce something that has never been produced before. The fact that it is new to the child, that it represents some of his own thinking and feeling, is more significant educationally than the question of novelty or technical originality.³

It is evident that the same talent would be required for a child to produce something that was unknown to him regardless of whether it was known or unknown by others.

Creativity has been defined as "the product of a judgment and therefore something that exists in some time and place. It is some product or act which is judged as creative by others."⁴ Further, another important step in identifying

¹Frieda K. Merry and Ralph V. Merry, The First Two Decades of Life (New York: Harper & Brothers, Publishers, 1958), p. 582.

²J. P. Guilford, "Creativity," The American Psychologist, V (September, 1950), 444.

³William B. Ragan, Modern Elementary Curriculum (New York: The Dryden Press, Inc., 1953), pp. 442-43.

⁴Elliott W. Eisner, "Defining Creativity," The Instructor, LXXII (October, 1962), 3.

creativity is the judgment of a person's products by experts. Creativity must be evaluated by others before it will be considered a worthy contribution and actually identified as creativity. Eisner¹ classifies creativity that falls into the domain of originality into three categories. They are Boundary Pushing, Inventing, and Boundary Breaking. Boundary Pushing is the ability to redefine or recognize new uses to which an idea or an object can be put to use. Examples of this type of creativity would be the first person who thought of using a key to open a can of coffee or creating designs and drawings by the use of symbols. Inventing is the creation of new devices and articles, usually by combining ideas and raw or finished materials. The Boundary Pusher rejects that which is already accepted by substitution of a new idea or theory that is more useful and adequate than the previous idea or theory.

It is pointed out by one authority² that the measure of the amount of knowledge one possesses is not a sufficient predictor of creativity. The fact that a person has accumulated a large amount of knowledge does not guarantee that superior creative production will be the natural outcome. By the same line of reasoning, this writer believes knowledge is

¹Elliott W. Eisner, "Creativity in the Classroom--II," The Instructor, LXXII (April, 1963), 5.

²Calvin W. Taylor, "Knowledge and Creativity," The Instructor, LXXIII (December, 1963), 5.

valuable to creative production by combining knowledge with the ability to work with the possibilities that may arise from existing knowledge. Gezi views creativity, "as the process of attempting to discover new and original solutions for problems or methods of dealing with problems."¹ The individual should be unique in his discoveries and have inventive abilities. Creativity is possessed to some degree by all individuals and, "is not considered a mystic or spiritual force that, when left unfettered, bursts into human action but rather is considered a product of both thinking on the part of the creator and judgement on the part of the viewer."² A child is not considered creative even though he may have had creative experience unless his activities have been judged as novel and useful to others, and these acts of creativity can be measured by test items. Novelty is given as one of the defining characteristics of creativity. To show novelty, an individual must produce novel answers and/or solutions to problematic situations.

An effort was made by Harold H. Anderson through the use of the symposium with several authorities contributing to define creativity. Rollo May defines creativity in this

¹Kalil I. Gezi, "Is Creativity Within the Academic Community Compatible with Operational Efficiency?" The Journal of Higher Education, XXV (April, 1964), 224.

²Elliott W. Eisner, "Research in Creativity: Some Findings and Conceptions," Childhood Education, XXXIX (April, 1963), 371.

symposium "as the process of bringing something new into birth."¹ Something new has been added to the vast amount of knowledge, something new has been created through the arts or sciences, or something new has been created to make life more meaningful and productive. Guilford² lists aspects of creative thinking as fluency, expressional fluency, the factor of ideational fluency, spontaneous flexibility thinking, adaptive flexibility thinking, originality, and elaboration. These areas of thinking are inclusive of a prodigious amount of the thinking process and represent the combined thinking of authorities in the field of creative research and educational psychology. Stoddard says,

To be creative, in short, is to be unpredictable, it is to be decidedly suspect in world affairs. The creative aspect of life is rightly viewed as action. Never simply contemplative, the creative act at its highest brings about notable differences in things, thoughts, works of art, and social structure.³

The conformer would find it hard to be creative if this definition of creativity is accepted. The creative child would be hindered only by the environmental influences that discourage independent effort and classrooms that require

¹ Rollo May, "The Nature of Creativity," Creativity and Its Cultivation, ed. Harold H. Anderson (New York: Harper & Brothers, Publishers, 1959), p. 57.

² J. P. Guilford, "Traits of Creativity," Creativity and Its Cultivation, ed. Harold H. Anderson (New York: Harper & Brothers, Publishers, 1959), pp. 144-58.

³ George D. Stoddard, "Creativity in Education," Creativity and Its Cultivation, ed. Harold H. Anderson (New York: Harper & Brothers, Publishers, 1959), p. 183.

conformity. A setting to allow freedom of inquiry, freedom to perform, and freedom to invent would be the obvious classroom environmental conditions if creativity is to flourish.

A symposium that explains what creative thinking is, what its conditions are, and how it is fostered, has been edited by Bruner, Terrell, and Wertheimer from the works of six eminent scientists meeting at the University of Colorado and describes creative thinking as "simply a special kind of problem solving behavior."¹ This behavior would include novel ideas, thinking that modifies previously accepted ideas, the ability to create a problem with a vague background of information, and to accomplish these things through self motivation. Bruner² sees creativity as an act that produces effective surprise, with the content of surprise extremely varied to include all of the enterprises in which mankind is engaged. Creativity, as described by Bruner, would not necessarily be planned. It would be the outgrowth of the production of creative thinking. Remus A. Harris, in the symposium

¹Allen Newel, J. C. Shaw, and Herbert A. Simon, "The Processes of Creative Thinking," Contemporary Approaches to Creative Thinking, ed. Howard E. Gruber, Glenn Terrell, and Michael Wertheimer (New York: Atherton Press, 1962), p. 65.

²Jerome S. Bruner, "The Conditions of Creativity," Contemporary Approaches to Creative Thinking, ed. Howard E. Gruber, Glenn Terrell, and Michael Wertheimer (New York: Atherton Press, 1962), p. 3.

edited by Paul Smith, defines creativity as the proper new association of old ideas.¹

The theory of the open and closed systems is presented by Rokeach.² The more open a system is depends on the extent to which a belief is based upon internal drives and/or external authority. For example, a person may maintain a certain religious view because of his religious background or maintain a closed mind to other philosophies because of basic beliefs from his own philosophy. A Fascist would have a closed mind toward many of the ideals of democracy. The more closed the individual's mind is, the less opportunity there would be to create new ideas.

The definitions discussed have been mainly those of individuals who have been creative in their productivity and those who have the ability to produce the non-existent from that which exists. A variety of factors and characteristics is involved in creative responses and individuals who show evidence of creative potential.

Characteristics of the Creative Person

Definitions of creativity are not in complete agreement, therefore, the individuals whose characteristics are listed as those of the creative person may vary. When

¹Remus A. Harris, "Creativity in Marketing," Creativity: An Examination of the Creative Process, ed. Paul Smith (New York: Hastings House, Publishers, 1959), p. 166.

²Rokeach, p. 71.

considering individuals whose productive life has proven them to be creative, authorities show some unanimity in listing characteristics of these highly productive people. There are these common problems that have been faced by these individuals as a result of typical drives during their youth. Authorities who consider the high I. Q. score as the only requirement to classify a person as creative will note different characteristics in the creative person from the authorities who define the creative person as an individual who creates the unknown from the known and produces or creates new products from raw materials and/or other products.

A study was made by Torrance¹ of the personality characteristics of highly creative children compared to children equally intelligent but less creative. The creative children were evaluated by their teachers and peers as children who have wild or silly ideas. They produce ideas that are nonconforming, ideas that do not follow accepted behavioral norms. This was shown by the unnecessary details in the art work which were unimitative and unique. Humor, playfulness, lack of rigidity, and apparent relaxation characterized their work. These characteristics seem to reveal valuable information that would help teachers identify creative children if characteristic norms were available. A sense of humor is considered a valuable characteristic if properly

¹Torrance, Guiding Creative Talent, pp. 78-81.

directed. Relaxation and lack of rigidity are seemingly valuable to creative production, but they are not always readily accepted by teachers as characteristics of ideal pupils.

In pointing out that creativity involves independence of thought, nonconformity to adult and peer group pressures, and breaking out of the mold, it is only natural that the highly creative child faces the problem of conforming and learning to live with tensions that arise from repression of creative needs as a result of belonging to the minority and being unaccepted by the majority. The problem may produce characteristics peculiar to the highly creative child. One authority¹ discusses these at length. The highly creative child may not be a well-rounded individual as a result of below normal achievement in reading, verbal skills, or other skills. With the emphasis placed on sex roles and sex norms, the highly creative child may diverge from sex norms as a result of the independence which is a characteristic of the creative individual. Highly creative children prefer to learn on their own and like to attempt difficult and dangerous tasks. While highly creative persons do not usually seek power, they work long hours to fulfill their creative needs. The creative person, according to Hoch,² not only has a sense

¹ Ibid., 106-124.

² Oscar Hoch, "Improving the Present Status of the Creative Student," The High School Journal, XLVI (October, 1962), 17-18.

of humor, is cheerful, and relaxed but confident in his sociability and asserts self-sufficiency.

The characteristics of the creative person that evidently produce the drives behind creative production listed by Taylor are:

a great dedication to one's work, intellectual persistence, liking to think, liking to manipulate and toy with ideas, need for recognition for achievement, need for variety, need for autonomy, preference for complex order and for challenges therein, tolerance of ambiguity, resistance to closing up and crystalizing things prematurely, coupled with a strong need for ultimate closure, need for mastery of a problem, insatiability for intellectual ordering a need to improve upon currently accepted systems. High energy with vast output through disciplined work habits is usually apparent.¹

A person, possessing these characteristics to a great degree would be an exceptional person. These characteristics support the theory that highly creative people produce ideas and items after manipulating that which exists to produce the nonexistent. This requires dedication to the task at hand by a person who uses intelligence at its best. Resistance to closing up and crystalizing things prematurely increases the opportunity to produce something new, especially if the person has high energy with vast output through disciplined work habits. The drive to have one's achievement recognized is sufficient to insure to some degree the ability for productive work. If this productive work is done by a person who feels a

¹ Calvin W. Taylor, "Who Are the Exceptionally Creative?" Exceptional Children, XXVIII (April, 1962), 427-28.

need to improve upon currently accepted systems, the probability that creative ideas and items will be produced is apparent. The need for autonomy that characterizes the creative person implies self-sufficiency and the need of freedom. They are sensitive to organizational controls. They prefer not to be supervised.

There is some diversity in authoritative evaluation of the characteristics of highly creative individuals. "What it takes to make the inventor, the writer, the artist, and the composer creative may have some factors in common, but there is much room for variation of pattern of abilities."¹ A more recent statement is "There is little doubt that many of the most creative geniuses the world has ever known have suffered from severe mental disorders. . . . Many people also believe that mental illness is a probable if not a necessary condition or cause of creativity."² Eisner says "In my own research with children I have found no differences in the personal or social adjustment of children judged to be artistically creative as compared to those who were judged not so creative."³

When teachers and parents were asked to rate sixty-two characteristics of children in the order they considered

¹J. P. Guilford, "Creativity," p. 451.

²Elliott W. Eisner, "Creativity and Mental Health," The Instructor, LXXII (February, 1963), 3.

³Ibid., 17.

them most worthy of rewards, independence was ranked second, independence in judgment was ranked nineteenth, and being courageous was ranked twenty-ninth.¹ This reveals a certain attitude of ambivalence by teachers and parents toward pupils with creative characteristics. They rated courtesy near the top. They considered it more important that the student be courteous than have characteristics that are considered important to creative production.

Characteristics that are listed as essentials of the creative process by Anderson are:

. . . desire to grow, capacity to be puzzled, awareness, spontaneity, spontaneous flexibility, adaptive flexibility, originality, divergent thinking, learning, openness to new experience, no boundaries, permeability of boundaries, yielding, readiness to yield, abandoning, letting go, being born every day, discarding the irrelevant, ability to toy with elements, change of activity, persistence, hard work, composition, decomposition, recomposition, differentiation, integration, being at peace with the world, harmony, honesty, humility, enthusiasm, integrity, inner maturity, self-actualizing, skepticism, boldness, faith, courage, willingness to be alone, I see, I feel, I think, gust for temporary chaos, security in uncertainty, tolerance of ambiguity.²

These words, phrases, and their synonyms are generally accepted by authorities as characteristics of creative persons. This list does not adequately cover all the characteristics of a creative person; however, it conveys a general

¹Paul W. Lawrence, p. 114.

²Harold H. Anderson, "Creativity in Perspective," Creativity and Its Cultivation, ed. Harold H. Anderson (New York: Harper & Brothers, Publishers, 1959), p. 238.

survey of those characteristics that enhance the probability that drives will stimulate the creative individual to action.

In a comparative study of high I. Q. students with highly creative students, the highly creative group was evaluated as less desirable than the average student by their teachers even though their scholastic achievement was equal to that of the group of high I. Q. children. The mean I. Q. of the high I. Q. group was 23 points higher than the highly creative group.¹

Characteristics that have been presented in this study are typical of those listed by authoritative sources. It is not enough that highly creative persons possess these characteristics but that they must be possessed to a high degree. They are the characteristics possessed by the creative child and the creatively productive adult. It is realized that all persons possess these characteristics to some degree.

Concepts Determined by Research and Literature

The constant probing by educational authorities into the areas of what learning is, what constitutes motivation to learn, what mental processes are involved in learning, and what creativity is, has produced many valuable concepts, concepts that have led to an improved understanding of creativity and provided guidelines for the production of instruments

¹Getzels and Jackson, pp. 30-31.

used in attempts to measure creativity. Concepts that are discussed in this study are (1) divergent and convergent thinking, (2) intelligence and creativity, (3) creativity and the many types of giftedness, and (4) the open and closed mind.

Two concepts were developed by Guilford--divergent and convergent thinking.¹ Divergent thinking deals with thinking that is speculative, thinking that does not conform to the known. It is thinking that takes off from information that is already possessed. It focuses on the unknown and discovering what is yet to be learned. This type of thinking requires intellectual inventiveness. There is a certain amount of risk affiliated with this type of novel and speculative adventure. There is more freedom of thought, allowing the thought processes to be directed in a number of directions. This allows opportunities for resourcefulness to be alleviated from suppression and provides a fertile environment for success. This is the "ability to deal inventively with stereotypic objects and events as perhaps their most salient characteristics."² The ability to discover as well as remember is important and is descriptive of divergent thinking. Convergent thinking is thinking that evolves from existing answers. It follows the usual and expected. There usually is

¹Elliot W. Eisner, "Some Findings and Conceptions," Childhood Education, XXXVIII (April, 1963), 371.

²Getzels and Jackson, p. 127.

one answer with thinking directed toward this answer. Conservative rather than constructive thinking is implied. Thinking that reproduces the known is typical of convergent thinking.

Both processes are found in all persons, but in varying proportions. The issue is not one of better or worse, or of more useful or less useful. Both have their place, and both must be recognized for their differences, commonalities, interactions, and distinctive functions in the individual's psychic economy. . . . In short, the conventional I. Q. test tends toward the evaluation of those cognitive processes that have been called convergent, retentive, conservative, more than those processes that have been called divergent, innovative, and constructive.¹

Convergent thinking, that which is measured by the I. Q. test, tends to describe what has traditionally been called intelligence, while divergent thinking involves creative thinking. There is evidence that both are related, and it is doubtful that any one person could be described as being high in one and relatively low in the other.

Studies have been made to compare intelligence and creativity. Torrance² concludes that while some studies indicate creative individuals tend to learn as much as highly intelligent students, such a generalization is not always true. The variation among schools evidently is the result of different types of learning situations provided by different schools. When emphasis is placed upon memory and conformity

¹ Ibid., p. 14.

² Torrance, Guilding Creative Talent, pp. 62-63.

in an authoritative classroom, the high I. Q. or highly intelligent student would probably learn faster. In classroom situations where creativity is encouraged and less conformity is required, the highly creative student may learn faster. When Getzels and Jackson¹ studied a group of highly intelligent and highly creative students, they found relatively low correlations between I. Q. and performance on tests that required creative thinking abilities. The highly creative group did not do as well as the high I. Q. group in the intelligence test situations, but were superior in tasks requiring inventiveness and originality. Both groups were superior to the school average in school achievement. Superior achievement by highly creative students accounts for overachievers in school. According to teacher evaluations, the high I. Q. group was more desirable than the average student; however, the highly creative group was not. The high I. Q. group tends to value and disvalue the same things their teachers do, while the highly creative group does not. They found the highly creative more stimulus free. Other authorities feel there is a very fine line that separates creativity and intelligence: "I behold that the distinction between creativity and intelligence is artificial; that the seeming separation between these concepts is due to a too narrowly conceived

¹Getzels and Jackson, pp. 20-76.

concept of intelligence."¹ Taylor² writes that intelligence accounts for only a minor part of creative production and is not an adequate measure of creativity: "I believe that creativity and creative productivity extend well beyond the domain of intelligence."³

There are indications that creativity and intelligence are positively related, that intelligence is required for creative responses, and that creativity involves many more learning factors than intellectual behavior. Intelligence is not a reliable predictor of creativity. Being highly intelligent does not insure high creativity, and vice versa. There are many types of giftedness that are related to the learning processes and creativity. Are there predictors of giftedness other than I. Q. tests?

One study⁴ collected all statements that described qualities that characterized giftedness in a child if he had such qualities to a great degree. These qualities were classified into thirteen categories. They were: intelligence, school achievement, social skills, athletic ability, personal appearance, physical health, energy level, sense of humor, creativity, morality, goal directedness, breadth of interests,

¹Eisner, "Research in Creativity," p. 374.

²Taylor, "Who Are the Exceptionally Creative?",
p. 423.

³Guilford, "Creativity," p. 444.

⁴Getzels and Jackson, p. 9.

and psychological adjustment. It has been stated previously in this study that there are more than fifty known factors of the intellect and many more that are not known. The over-achiever might be classified as gifted in school achievement along with the expected high-achiever: "For all practical purposes, the term 'gifted child' has become synonymous with the expression 'child with a high I. Q.,' thus blinding us to other forms of excellence."¹ Also, the term creative child has become synonymous with the artistically talented child, thus placing limitations on efforts to identify cognitive abilities in areas other than the arts.

The open and closed systems have been studied in relation to creativity. The ability that is shown in evaluating the relevant and the irrelevant information pertaining to the situations facing a person determines to the extent the mind is open or closed.² The extent a system is open is shown by the capacity to evaluate and respond to relevant information based upon its worth without being influenced by irrelevant information arising from outside influences and beliefs from within. Irrelevant outside influences would include parental authority, peer group acceptance, social and institutional pressures, and cultural values. This would include the philosophy of the individual or the prevailing local or national

¹Jacob W. Getzels and Philip W. Jackson, "The Meaning of Giftedness," Education, LXXXII (April, 1962), 460.

²Rokeach, pp. 54-70.

philosophy, religious beliefs and influence, and socio-economic background. The more open the system, the more the person should be able to resist these pressures if they involve irrational reasoning. The extent a system is closed depends on the degree that responses are influenced by outside irrelevant pressures and to the extent to which a person cannot distinguish between irrelevant and relevant information. The more closed the system, the less a person is able to evaluate information on its own merits and the more a person is sensitive to prohibitions and pressures of his group. If the system is completely closed, the person would be completely controlled by these outside forces. Individuals do not reach the condition when they have a completely closed system or a completely open system. All people are driven by both rational and irrational forces. Most people in most situations respond to some degree to both systems.

The openness and closedness systems are compared by Anderson¹ by presenting a scale with the top representing the open, and the closed is a finite point at the bottom. The open is socially integrative, and environmental pressure is at a minimum. These individuals are not strongly concerned with security and personal status. The closed is effected by strong environmental pressure and there is conformity in

¹Harold A. Anderson, "Creativity as Personality Development," Creativity and Its Cultivation, ed. Harold H. Anderson (New York: Harper & Brothers, Publishers, 1959), p. 140.

behavior. Their first consideration is security and self-protection. They are highly selective in their perceptions. "The open system is thus the ideal, propitious environment for creativity, and anything in the environment that tends to close the system makes the environment unpropitious for creativity."¹

There is evidence that open-mindedness affects creative production favorably and that closed-mindedness seems to impede creativity. No one person responds completely to either an open or a closed system. They are influenced by both systems to some degree.

Various concepts have been introduced to describe the processes of giftedness and creativity, and the relation of creativity to giftedness. Some are descriptive of creativity, and others measure factors that influence creative production.

The Measurement of Creativity and Instruments

Used to Measure Creativity

A variety of methods and instruments have been used in attempts to evaluate and measure creativity. These attempts manifest a realization and a need to move away from traditional concepts about mental growth processes, achievement, and existing attitudes toward the social well being of an individual. The measurement of creativity should be adequate in evaluating those concepts that are considered

¹Anderson, "Creativity in Perspective," p. 253.

processes of creativity. These would include many of the processes mentioned in the previous sections of this chapter. Deficiencies of intelligence tests as measuring instruments for creativity are discussed by Torrance.¹ Intelligence tests place emphasis on convergent, conforming thinking and traditional academic values. They deal with how fast relatively unimportant problems can be solved and require conventional and conformitive thinking. The tests penalize those who can perceive previously unnoticed subtle points, are sometimes superficial and intellectually dishonest, and even degenerate into subjective guessing games. The progress that has been made in developing creativity tests is directed in most instances away from the measure of those factors that have been traditionally accepted and suppress creativity. The discussion that follows presents authoritative reactions to factors comprising creativity and instruments that have been produced to evaluate creative potential of a person.

Instruments produced to measure creative potential should evaluate, sensitivity to problems, ideational fluency, flexibility of set, ideational novelty, synthesizing ability, analyzing ability, reorganizing or redefining ability, span of ideational structure, and evaluating ability.² There may be identity between some of these factors, and other qualities

¹Torrance, Guiding Creative Talent, pp. 18-22.

²Guilford, "Creativity," p. 453.

may span more than one factor. This identification marks the beginning of increased interest in the identification of creative factors and measures. Test construction that has resulted from this meager beginning includes those creativity tests used by Getzels and Jackson¹ in their study of gifted children. These tests involved the ability of children to deal with object-space relations and respond inventively to numerical and verbal scores. The scores of these tests did not depend upon a predetermined single answer, but on a variety of responses that were novel as a result of a given stimulus. There were five creative measures: Word Association, Uses of Things, Hidden Shaper, Fables, and Make-up Problems. In the Word Association test, the student was required to produce as many definitions as possible from common stimulus words. The test, Uses for Things, listed a number of familiar word stimuli. The score depended on the number of uses the student listed that could be made of the objects. The Hidden Shapes test is part of Cattell's Objective Analytic Test Battery. The Fables test was made up of four fables that had the last line missing. The subject was required to produce three endings--moralistic, humorous, and sad. The Make-up Problems test consisted of four mathematical paragraphs. The score was based on the number of mathematical problems that could be made up from the given information. The total score

¹Getzels and Jackson, Creativity and Intelligence, pp. 16-19.

was used as a predictor of creative talent that a child possessed.

The Bureau of Educational Research of the University of Minnesota, after three years of experimentation, constructed the Minnesota Tests of Creative Thinking.¹ The Bureau started with the Guilford tasks: Unusual Uses, Impossibilities, Consequences, Problem Situations, Improvements, and Problems. Experiences of eminent scientific discoverers, inventors, and creative writers were used as bases for developing tasks that were models of the creative process. The result was the development of tests that would yield scores on the factors: sensitivity to problems, ideational fluency, flexibility, and originality. The lists include² four non-verbal tasks: Incomplete Figures, Picture Construction, Circles and Squares, and Creative Design. Verbal tasks using non-verbal stimuli include the Ask-and-Guess test and the Product Improvement test. Verbal tasks using verbal stimuli include Unusual Uses tasks, Impossibilities task, Consequences, Just Suppose, Situations, Common Problems, Improvements, Mother Hubbard Problem, Cow Jumping Problem, Imaginative Stories, and other tasks that are under development. These tasks have developed to assess creative thinking from

¹ Torrance, Guiding Creative Talent, pp. 44-48.

² Ibid., pp. 213-253.

kindergarten through graduate school. There is still a need for much work toward developing meaningful scores and norms.

The Dogmatism Scale was used in a study of the measurement of the open and closed systems.¹ The Dogmatism Scale was developed to measure individual differences in openness or closedness of belief systems, general authoritarianism, and general tolerance. Statements were designed to measure the characteristics of open and closed systems. The scale contains items involving the belief-disbelief, central-peripheral, and time-perspective dimensions. Another scale used in this same study was the Opinionation Scale.² The Opinionation Scale was developed to measure general intolerance. One half of the items were prepared to agree with a belief and the other one half of the items were prepared to disagree with a belief. The scale measures the following variables: total opinionation, left opinionation, right opinionation, opinionated rejection, opinionated acceptance, and conservatism-liberalism.

These tests were developed to measure the characteristics that the authors believed produced creativity respectively. They include the five creative measures used by Getzels and Jackson, the Minnesota Tests of Creative Thinking, the Dogmatism Scale, and the Opinionation Scale.

¹Rokeach, pp. 71-80.

²Ibid., pp. 80-87.

Development of Creativity in the Individual

There is evidence from the findings of research that creativity can be improved by the proper kind of classroom environment. When creative students have characteristics such as producing ideas off the beaten track, following their own interests, resisting group work, humor and playfulness, producing wild ideas, need for autonomy, relaxation, lack of rigidity, and nonconformity, there is reason to believe the traditional classrooms and school programs must use some new approaches if creativity is encouraged. One source¹ lists methods to improve creativity. They are providing curriculum changes that enhance creative achievement, rewarding creative achievement, and providing for continuity of creative growth. Parnes² discusses two studies that have provided some indication as to the value of courses offered to improve creativity. This section discusses three ways of increasing creative learning and two studies about courses offered to improve creativity according to the authorities presenting these ideas.

A curriculum that provides opportunities for creative achievement can be enriched through assignments requiring original work. Original assignments would be work that had not been previously done and include the production of

¹Torrance, Guiding Creative Talent, pp. 367-70.

²Sidney J. Parnes, "Education and Creativity," Teachers College Record, LXIV (January, 1963), 332-34.

original ideas and products. It would not require the reproduction of that which is known beyond the need for such knowledge as a basis for producing original work. These assignments would include opportunities for self-initiated learning. The creative child is given occasion to break away from the beaten track and follow self interests. He can learn before the so-called readiness period under these circumstances. The student is allowed to make mistakes and profit from them and work with projects that are very hard. These efforts cannot always be evaluated on the basis of fundamental skills. These assignments should provide opportunity for oral creative work. Another type of assignment would allow experimentation in order to provide the creative child an outlet to express curiosity and use the imaginative approach to ideas and activities. The creative child finds satisfaction by producing the unknown through the experimentation with wild ideas and freedom of expression. The inquiring mind of the creative child meets with the challenges that are pleasing and gratifying when assignments are enriched by experimentation. A curriculum that provides opportunities for creative achievement can be provided daily by the questions asked by teachers and the type of problems that are discussed.

Rewarding creative achievement may be done by showing respect for the usual questions and unusual ideas, and showing children their ideas have value. The teacher should give credit for self-initiated learning and provide chances for

children to be creative by learning and discovering without pressure of immediate evaluation. If a teacher respects the unusual questions, that are characteristic of a creative child, the new and unusual may evolve rather than the ordinary and expected. When ideas of creative children are valued positively by a teacher, it is likely that continued effort to produce creative ideas will result. It will be necessary for the teacher to divert from the conformitive classroom procedures. The creative student's original ideas may be expected to come from openness to feelings that sometimes are considered fantastic. The creative child asks questions that help explore known knowledge. When credit is given to a creative child for self-initiated learning, the child may attempt difficult tasks that will produce new and original ideas. If self-initiated learning is encouraged and rewarded in the classroom, the teacher may face unfamiliar territory. Providing creative children opportunities to learn and discover without pressure of immediate evaluation may be done by delaying criticism, testing, and other forms of evaluation that are the normal processes of the traditional classroom. Learning and discovery can be suppressed by immediate evaluation resulting in loss of future creative efforts.

Provision for continuity of creative development, to be effective, begins and is guided from birth. If creative development is stifled too early, it will become imitative. In order to provide continued creative development, there

must be a willingness to permit one creative thought or project to lead to another. The teacher must venture forth with the creative child into the unknown.

The first of the two studies that are discussed in this study revealed that students who took the one-semester course to improve creative ability were significantly superior in five of the seven measures to a group of matched subjects not taking the course. The significant progress was in the areas of leadership ability, dominance, persistence, and social imitation. Results of the second study, which evaluated the persistence or carry-over of creative problem-solving courses, indicated the improved creative productivity lasted for more than eight months after the courses were complete. These studies signify the value of courses to improve creative factors.

It is evident that there is a need for classroom administrators and teachers to become more aware of the value of providing and encouraging opportunities for the development of creative talent. The studies discussed in the previous paragraph have emphasized the value of enriching school programs by allowing opportunities for creativity to flourish and constantly reducing those situations that suppress and stifle creative production.

Summary

Research in the area of creativity is extensive but not conclusive. In this study, the definition of creativity from many authoritative sources has been discussed. There seems to be an element of agreement that creativity is the ability to produce the nonexistent from the existing and that everyone possesses it to some degree. The characteristics of the highly creative person discussed by authoritative sources are those characteristics they consider important in producing creative talent. Concepts that have been emphasized by authorities related to the development of a better understanding include divergent and convergent thinking, intelligence and creativity, creativity and the many types of giftedness, and the open and closed mind. The instruments that have been produced to measure creative potential and creative talent were developed to measure those talents necessary to produce creative individuals. There have been numerous but less than ample studies made to improve individual creative talent. There is evidence these studies are valid and contribute much valuable knowledge to broaden the understanding of creative talent, creative production, and creative learning.

CHAPTER III

PROCEDURE OF THE STUDY

Population

The population in this study included one hundred seventy-four subjects. They represented an equal number of rural and urban students. The group was equalized by matching pairs on the basis of grade classification, sex, chronological age, and intelligence quotient.

The Rural Group

The rural group included all the students attending classes at the Canute junior and senior high schools in grades nine through twelve during the days the creative measuring instruments were administered. All students present the first day the tests were administered were informed that the study was a comparative study and there was a need for a total population sampling of the rural students. They were asked to take the tests if they wished to participate in the study and informed that they would be excused if they, for any reason, chose not to take part. All students present chose to participate in the study. The tests were administered on two separate days. Students who missed both days

were excused. A few others were excluded when, after two attempts to administer the tests, the urban subject who had been matched with them failed to appear to participate in the study. There was a total of eighty-seven rural subjects who completed the tests and whose paired urban subject participated in the study.

The Urban Group

The counselors from the Northeast Junior-Senior High School, Oklahoma City, Oklahoma, provided cumulative records of all students in grades nine through twelve. Students were chosen by pairing them with the rural subjects on the basis of their grade classification, sex, chronological age, and intelligence quotient. The tests were administered to the subjects on two separate days to give those who were absent the first day an opportunity to participate. The subjects were informed prior to the administering of the tests that the results of the tests would be used in a comparative study and that they should participate on a voluntary basis only. Eighty-seven urban subjects participated.

Selection of Matched Pairs

Introduction.--The total population of the rural group was included in the study. The urban group was selected by matching pairs on the basis of grade classification, sex, chronological age, and intelligence quotient.

Grade Classification.--The grade classification of the two groups was controlled by matching students from the

same grade level. The grade level was determined by the information in the cumulative record folders. After the information about the rural subjects had been compiled, the cumulative records of all urban students in grades nine through twelve were grouped by grades.

Sex.--The sex classification was determined by the information found in the cumulative folders. After the rural subjects had been classified by grades, they were classified into two groups in each grade according to sex. Since the total population of the rural school participated in this study, they were classified first. The total population of each grade of the urban school, in grades nine through twelve, was classified into two groups using sex as the determining factor.

Chronological Age.--Information from the cumulative records was used to determine the chronological ages of rural and urban subjects. The comparison of chronological age was made after intelligence quotients were evaluated. The chronological ages of urban students at the same grade level and of the same sex who had the same intelligence quotient as each rural subject were compared with the rural subjects. The urban student with the chronological age nearest the rural subject's chronological age was chosen as the matched pair of that rural subject and as a subject for the study.

Intelligence Quotient.--All students attending the urban school had been given the California Mental Maturity

test. The same test was administered to the rural students. Several urban students had the same intelligence quotient as a rural subject. Chronological age was the last factor used when pairing the rural and urban subjects.

Summary.--The urban students were matched with the rural subjects by first selecting all urban students who had the same grade classification, were of the same sex, and had the same intelligence quotient as each of the rural subjects. The urban student from each group whose chronological age was nearest the rural subject's chronological age was then chosen to complete the matching of pairs. The matched pairs were the subjects of this study.

Tests Used and Information Sought

Creativity Tests

A battery of five tests was used to gather creativity data from the urban and rural groups. The score, on each of the tests, depended on the number of responses to a stimulus or stimuli. The responses required were original and novel rather than a single predetermined answer. The five tests were

1. Word Association Test
2. Uses of Things Test
3. Hidden Shapes Test
4. Fables Test
5. Make-up Problems Test

Word Association Test.--The Word Association Test was designed to provide the subject an opportunity to respond with as many definitions as possible to each of twenty word stimuli. The words were common words. The subject was not required to write the complete definition. A single word would usually be adequate. The score was the number of different meanings supplied. Not only were usual definitions given credit but recognized slang expressions that are commonly used by youth. The subjects were allowed fifteen minutes to complete the test.

The average coefficient of reliability was .87 based on the responses of a random sample of thirty-two subjects from a single class.¹

Uses of Things.--The Uses of Things contains stimuli of five common words. They are bricks, pencils, paper clips, toothpicks, and sheet of paper. The subject is required to write as many uses as possible for each of the articles. The subjects were instructed that they would have approximately fifteen minutes to complete the test. The score was the total number of different uses supplied for the five objects.

The average coefficient of reliability was .86 based on the responses of a random sample of forty-five students.²

¹Getzels and Jackson, Creativity and Intelligence, p. 200.

²Ibid., p. 201.

Hidden Shapes.--The Hidden Shapes G-37 test contains eighteen simple geometric figures followed by four complex geometric figures. The subject is required to determine which complex geometric figure contained the simple geometric figure. There was a three and one-half minute time limit. The score was the number of incorrect answers. "This test is a part of Cattell's Objective-Analytic Test Battery."¹

Fables Test.--The Fables Test consists of four fables which had the endings missing. The subjects' task was to make up three different endings for each fable. The first ending should be moralistic, the second ending should be humorous, and the third ending should be sad. These endings were to be based upon what the subject thought the author would have said. The subjects were given approximately thirty minutes to complete the test. The score was based upon one point for relatedness of each answer. The subject's possible score was twenty-four.

The average coefficient of reliability was .87 based on the responses of a random sample of forty-six subjects from a single class.²

Make-up Problems Test.--The Make-up Problems test consists of four paragraphs containing mathematical information. There is enough information in each paragraph to prepare a number of mathematical problems. The subject was

¹Ibid.

²Ibid., p. 205.

required to read the paragraph and prepare as many problems as possible from the information in the paragraphs. The subject did not have to know how to work the problems prepared; however, there had to be sufficient information in a paragraph to solve each problem prepared from the information in the paragraph. The subjects were allowed thirty minutes to complete the test. The score depended on the total number of valid problems prepared by the subject. "Data from a randomly chosen class of 45 students yielded a reliability coefficient of .81."¹

Information Sought

The information sought was provided by the subjects by filling out a form prepared for this purpose. The form had blanks for the subjects to provide their name, grade, sex, age, birth date, religious preference, and the occupation of the subject's mother and/or father or guardian. There were thirty-nine occupations listed, with unemployed, deceased, and other alternate choices. The personal information was used to confirm information taken from the cumulative records. The occupational information was used to classify the subjects into socio-economic groups.

Administration of Instruments of Measurement

Two sessions were used at both the urban and the rural schools in collecting the creativity test data from the

¹Ibid., p. 208.

subjects. All creative instruments of measurement were administered at each session. The data sheet was administered at the first session at each school. The purpose of the two sessions was to provide an opportunity for subjects absent during the first session to participate later. The Word Association Test, the Fables Test, and the Hidden Shapes G-37 Test were administered during the first part of each session. The subjects were given a ten-minute break followed by the administration of the Uses of Things Test and the Make-up Problems Test. The instruments were first administered to the rural subjects. A third session was used to administer the California Short-form Test of Mental Maturity to the rural subjects. The intelligence quotient scores made by the rural subjects were used in matching pairs between the urban and rural subjects. The same test scores were available in the cumulative records of the urban subjects.

Treatment of Data

The scores made by each pupil on the five tests were added together to obtain a total creativity score. The total scores were subjected to the proper statistical analysis to test the hypothesis that there is no significant difference between the creativity of rural and urban students and the sub-hypotheses that there is no significant difference between the creativity of subjects with different religious preferences, different sex, and different socio-economic levels.

The statistical measure selected to test the significant difference between the creativity scores made by the paired urban and rural subjects was the t-test for testing the difference between uncorrelated means in two samples of equal size.¹

The subjects, both urban and rural, were divided into two groups according to the religious preference shown on the information sheets. The first group included subjects indicating Catholic preference and the second group included subjects indicating Protestant preference. There were forty-two Catholic-choice subjects and 117 Protestant-choice subjects. The number of subjects showing no choice was five, which was considered insignificant. The subjects were divided into two groups according to sex. There were ninety male subjects and eighty-four female subjects. The same statistical measure was chosen to test the significant difference between the creativity scores of subjects with different religious preferences and subjects with different sex. The measure chosen was the t-test of a difference between means with an unequal number of subjects.²

The subjects were classified into four socio-economic groups according to the occupation of the head of the family.

¹ James E. Wert, Charles O. Neidt, and J. Stanley Ahmann, Statistical Methods in Education and Psychology Research (New York: Appleton-Century-Crofts, Inc., 1954), p. 130.

² Ibid., pp. 130-33.

The four groups were agricultural, wage earner, professional, and self-employed. This grouping was a variation of the socio-economic grouping made by Shartle.¹ The statistical measure used to test the significant difference between the creativity of subjects with different socio-economic levels was the test for testing the differences among several means by analysis of variance.²

¹Carroll L. Shartle, Occupational Information: Its Development and Application (Englewood Cliff, N. J.: Prentice Hall, Inc., 1952), p. 333.

²Henry E. Garrett, Elementary Statistics (New York: David McKay Company, Inc., 1962), pp. 170-74.

CHAPTER IV

ANALYSIS OF DATA

A comparison was made by testing the null hypothesis that there was no significant difference between the creativity of the urban and rural groups. The variables--religious preference, sex, and socio-economic levels--stated as null hypotheses were tested for significant differences. The required significant level for statistical difference was set at .05.¹

Creativity of Urban and Rural Students

The first hypothesis tested was to determine if there was significant difference between the creativity of urban and rural students. In Table 1, the number of subjects tested was eighty-seven urban and eighty-seven rural. The urban group score range was from thirty-two to 123 with a mean score of 81.724. The rural group score range was from thirty-seven to 165 with a mean score of 93.885. There was a mean difference between the two groups of 12.161 with a t-score of 1.119. By entering a table of t with 86 df, the

¹Allen L. Edwards, Statistical Analysis (New York: Rinehart and Winston, 1960), p. 134.

TABLE 1

t-TEST OF THE MEAN DIFFERENCE IN CREATIVITY
OF THE URBAN AND RURAL GROUPS

Groups	Mean Difference	S. E. M. Difference	Degrees of Freedom	*t
Urban	12.161	10.861	86	1.119
Rural				

*t for P of .05 = 1.988

positive value of t is equal to 1.988 at the .05 level. No significant difference was found between the creativity scores of urban and rural students. The null hypothesis was not rejected.

Creativity of Students with Different
Religious Preferences

The variable stated in the null hypothesis that there is significant difference between the creativity of students with different religious preferences was tested. There were forty-four Catholic subjects and 117 Protestant subjects in the two groups. The Catholic group score range was from forty-three to 129 with a mean score of 89.1. The Protestant group score range was from thirty-seven to 165 with a mean score of 88.8. There was mean difference between the two groups, shown in Table 2, of .3 with a t-score of .074.

TABLE 2

t-TEST OF THE MEAN DIFFERENCE IN CREATIVITY
OF THE CATHOLIC AND PROTESTANT GROUPS

Groups	Mean Difference	S. E. M. Difference	Degrees of Freedom	*t
Catholic	.3	4.06	86	.074
Protestant				

*t for P of .05 = 1.987.

Entering a table of t with 84 df,¹ the positive value of t is equal to 1.987 at the .05 level. No significant difference was found between the creativity scores of the Catholic and Protestant groups. The null hypothesis was not rejected.

Creativity of Male and Female Students

The second variable stated in the hypothesis is that there is no significant difference between the creativity of students of different sexes, was tested. There were ninety male subjects and eighty-four female subjects in the two groups. The male group score range was from thirty-eight to 148 with a mean of 86.344. The female group score range was from thirty-two to 165 with a mean of 88.845. There was a mean difference, as illustrated by Table 3, between the two

¹Wert, p. 333.

TABLE 3

t-TEST OF THE MEAN DIFFERENCE IN CREATIVITY
OF THE MALE AND FEMALE GROUPS

Groups	Mean Difference	S. E. M. Difference	Degrees of Freedom	*t
Male	2.501	3.785	86	.661
Female				

*t for P of .05 = 1.988

groups of 2.501. By entering a table of t with 86 df, the positive value of t is equal to 1.988 at the .05 level.

There was no significant difference found between the creativity scores of the male and female groups. The null hypothesis was not rejected.

Creativity of Students from Different Socio-Economic Levels

The third variable stated in the hypothesis is that there is no significant difference between the creativity of students from different socio-economic levels. There were twenty-one subjects whose fathers or heads of the family were self-employed, twenty subjects whose fathers or heads of the family were professional, fifty-six subjects whose fathers or heads of the family were engaged in agriculture, and seventy subjects whose fathers or heads of the family were

wage-earners. The self-employed group had a score range from forty-eight to 119. The professional group had a score range from sixty-two to 148. The agriculture group had a score range from thirty-seven to 136. The wage-earner group had a score range from forty to 165. Table 4, the analysis of variance table for the scores of the different socio-economic levels, shows the source of variation between groups with a sum of squares equal to 1,799, degrees of freedom equal to 3, and a variance equal to 599.67; the source of variation within groups with a sum of squares equal to 90,750, degrees of freedom equal to 163, and a variance equal to 556.75. The F ratio is 1.077. By entering a table of F with 3 df between groups and 163 degrees of freedom within groups, F is equal to 2.66 at the .05 level. The F is insignificant; therefore, the null hypothesis is not rejected for all pairs of means.

Evaluation of the Hypotheses

The hypothesis that there is no significant difference in the creativity between rural and urban students of Oklahoma was tested. The null hypothesis was not rejected. The statistical test produced a t score of 1.119. When entering a t table with 86 df, values of t equal to or greater than 1.119 would occur, under the hypothesis stated, with a theoretical relative probability less than .3 and greater than .2, a relatively greater probability than the 5 per cent level set for the comparison of these data. With 86 degrees

TABLE 4

ANALYSIS OF VARIANCE FOR THE SCORES MADE BY
THE DIFFERENT SOCIO-ECONOMIC LEVELS

Source of Variation	Sum of Squares	Degrees of Freedom	Variance
Between Groups	1,799	3	599.67
Within Groups	90,750	163	556.75
Total	92,549		

$$F = \frac{599.67}{556.75} = 1.077$$

$$F \text{ at } .05 = 2.66$$

$$F \text{ at } .01 = 3.90$$

of freedom the t value, 1.119, is smaller than 1.988 which is demanded for significance at the 5 per cent level. Thus the null hypothesis that there is no significant difference in the creativity between rural and urban students of Oklahoma cannot be rejected. The interpretation may then be made that, with the two groups tested, it is assumed there is not increased creativity produced in one group over the other.

The hypothesis that there is no significant difference in the creativity between students with different religious preferences was tested and a t score of .074 was obtained. With 86 degrees of freedom, this t-value is smaller

than 1.987, which is demanded for significance at the 5 per cent level. Thus the null hypothesis, as stated cannot be rejected. The interpretation may then be made that, with the two groups tested, there is no increased creativity in one group over the other. The hypothesis that there is no significant difference in the creativity between students with different sex, was tested and a t score of .661 was obtained. With 86 degrees of freedom, this t value is smaller than 1.987, which is demanded for significance at the 5 per cent level. The null hypothesis, as stated, cannot be rejected. Considering the two groups tested, the interpretation may be made that there is no increased creativity of one group over the other. A statistical test, the analysis of variance, was used to test the significance of the hypothesis that there is no significant difference in the creativity between students with different socio-economic levels. An F score of 1.077 was produced. This F score is less than 2.66, which is required for significance at the 5 per cent level. The null hypothesis was not rejected, and the interpretation is that there is no relative difference in the creativity of the groups from different socio-economic levels.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The major purpose of this study was an attempt to evaluate the school as a cultural influence upon the creativity of students. The entire population of the students in grades nine through twelve from the Canute junior and senior high schools, Canute, Oklahoma, a rural school, was compared with an equal number of students from the Northeast Junior-Senior High Schools, Oklahoma City, Oklahoma, an urban school. The urban students were selected by matching pairs with the rural students using sex, grade level, mental maturity, and age as determining factors. Eighty-seven subjects from each school participated in this study. The hypothesis stated was that there is no significant difference in the creativity between rural and urban students in Oklahoma. The comparison was made by subjecting creativity test scores made by the two groups to the proper statistical analysis. The creativity scores were the total scores obtained by each subject when five creativity measuring instruments were administered to them. They are (1) Word Association, (2) Uses of Things, (3) Hidden Shapes, (4) Fables, and (5) Make-up Problems. The

results of the statistical analysis of this data indicated there was no significant difference in the creativity of the two groups.

The subjects' scores were divided into two groups based upon the subjects' religious preference between Catholic and Protestant given by the subjects. The subjects' scores were then divided into two groups based upon the sex of the subjects. Last, the subjects' scores were divided into four groups based upon the socio-economic level of the subjects. The scores were divided into these groups so that the following sub-hypotheses could be subjected to statistical analysis:

1. There is no significant difference in the creativity of students with different religious preferences.
2. There is no significant difference in the creativity of students of different sex.
3. There is no significant difference in the creativity of students with different socio-economic levels.

The results of the statistical analysis of the first hypothesis indicated there was no significant difference in the creativity scores made by students with different religious preferences. Statistical analysis of the data in the second hypothesis led to the conclusion that there was no significant difference between the scores made by students of

different sex. The last hypothesis was subjected to statistical analysis. The results indicated there was no significant difference between the means of the scores made by the students with different socio-economic backgrounds.

The survey of authoritative sources in the area of creativity reveals an element of agreement that creativity is the ability to produce the nonexistent from the existing and nonexistent and that everyone possesses creativity to some degree. Instruments produced to measure creativity have been developed to measure the creative talents considered by the test's authors necessary to produce creatively. The characteristics of the highly creative person discussed by authoritative sources are those characteristics the authorities consider important in the production of creative talent. Concepts considered related to creativity were introduced and discussed. There have been studies made to improve creativity which have produced positive results. There is evidence that these studies have contributed valuable knowledge to broaden the understanding of creative talent, creative production, and creative learning.

Conclusions

Statistical analyses, based upon a significant level for statistical difference of .05, of the creativity scores made by the rural and urban subjects participating in the study suggest the following conclusions:

1. There is no significant difference in the creativity of the rural and urban students in Oklahoma.
2. There is no significant difference in the creativity of students of different sex.
3. There is no significant difference in the creativity of students with different religious preferences.
4. There is no significant difference in the creativity of students with difference socio-economic levels.

It is felt that the variable of rural versus urban cultural environments suggests the elimination of this as a valid dichotomy. The unusually high scores indicating creative subjects, though not numerous, were mostly rural youths. This suggests that a more rigorous and tightly designed study might still reveal some significant difference but it is this writer's view that such variables should be sought in the individual and his interactions rather than in the institution and its influence upon his behavior.

Recommendations

Recommendations, based on the procedures, survey of authoritative literature, analysis of data, and findings of this study, are as follows:

1. Since previous studies, as revealed in this study, have suggested that creativity may be increased or suppressed by school environment and this study implies there is no significant difference in the creativity of the rural and urban students in Oklahoma, there would be value in studies comparing the creativity of students attending schools with authoritarian leadership tendencies with those attending schools with democratic leadership.

2. Further research should be made to determine techniques and procedures used in classrooms that will encourage creativity.
3. Comparative studies to determine whether mental maturity test scores or creativity test scores would be more valid in predicting school achievement would be of value.
4. Further studies should be made--to develop a more universally acceptable and refined definition of creativity, and to determine what characteristics predict creative talent--that will lead to the production of standardized creativity tests.
5. Comparative studies to determine the correlation between the tests used in this study and other tests that have been produced to measure creativity.

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APPENDIX A

**GRADE CLASSIFICATION, BIRTHDATE, I. Q., RELIGIOUS
PREFERENCE, PARENT OR GUARDIAN OCCUPATION,
INDIVIDUAL TEST SCORES, AND TOTAL TEST
SCORES MADE BY THE URBAN MALE GROUP**

APPENDIX A

GRADE CLASSIFICATION, BIRTHDATE, I. Q., RELIGIOUS PREFERENCE,
 PARENT OR GUARDIAN OCCUPATION, INDIVIDUAL TEST SCORES,
 AND TOTAL TEST SCORES MADE BY THE URBAN MALE GROUP

Sub- ject	Grade	Birthdate	I.Q.	Reli- gion	Parent Occupation	Word Assoc	Uses Test	Hidden Shapes	Fables Test	Make-up Problems	Total Score
1	12	7/21/46	118	Prot	Wage Earner	37	23	31	8+10	14	123
2	12	2/ 3/46	114	Prot	Wage Earner	34	25	32	4+ 9	13	117
3	12	6/30/46	111	Prot	Professional	27	30	34	5+ 8	13	117
4	12	5/18/46	109	Prot	Professional	33	16	28	7+ 8	9	101
5	12	4/11/46	104	Prot	Professional	29	8	19	5+ 6	14	81
6	12	4/ 6/46	102	Prot	Wage Earner	23	25	32	5+ 8	5	98
7	12	3/28/46	98	Prot	Professional	30	17	20	6+ 6	9	88
8	12	4/16/45	96	Prot	Self Employ	24	15	4	0+ 5	0	48
9	12	5/26/46	96	Prot	Wage Earner	31	32	31	5+ 9	8	116
10	12	8/ 7/46	95	Prot	Wage Earner	25	20	25	3+ 6	0	79
11	11	4/ 9/47	115	Prot	Wage Earner	34	14	21	6+10	8	93
12	11	4/12/47	112	Prot	Self Employ	31	19	14	5+ 6	10	85
13	11	7/26/47	109	Prot	Wage Earner	39	20	27	3+ 6	13	108
14	11	6/ 4/46	108	Prot	Wage Earner	28	19	25	8+10	9	99
15	11	1/27/47	107	Prot	Professional	28	36	21	5+ 7	8	105
16	11	7/ 2/46	102	Prot	Agriculture	19	19	31	3+ 7	15	94
17	11	2/21/47	96	Prot	Wage Earner	39	17	18	2+ 7	9	92
18	11	3/30/47	93	Prot	Wage Earner	27	20	27	5+ 9	8	96
19	11	12/31/45	91	Prot	Wage Earner	10	6	22	2+ 5	6	51
20	11	12/14/46	85	Prot	Wage Earner	15	15	8	4+ 8	0	50
21	11	12/ 5/46	85	None	Wage Earner	10	12	21	1+ 3	4	51

APPENDIX A--Continued

Sub- ject	Grade	Birthdate	I.Q.	Reli- gion	Parent Occupation	Word Assoc	Uses Test	Hidden Shapes	Fables Test	Make-up Problems	Total Score
22	11	11/ 2/45	85	Prot	Unemployed	7	4	8	0+ 2	0	21
23	11	10/12/46	81	Prot	Wage Earner	9	9	27	1+ 3	7	56
24	11	4/ 3/46	80	None	Self Employ	17	4	22	2+ 2	3	48
25	11	3/27/47	78	Prot	Self Employ	16	8	12	3+ 9	4	52
26	10	2/18/48	106	Prot	Wage Earner	38	25	17	6+10	8	104
27	10	8/21/48	105	Prot	Wage Earner	20	11	24	3+ 8	6	61
28	10	8/22/47	105	Prot	Professional	17	17	13	4+ 4	7	62
29	10	3/22/48	104	Prot	Unclassified	23	21	11	0+ 4	2	61
30	10	3/ 3/48	101	Prot	Professional	18	29	32	5+10	13	107
31	10	9/11/48	98	None	Wage Earner	12	9	22	0+ 3	4	49
32	10	9/15/48	97	Prot	Wage Earner	8	12	8	2+ 7	0	37
33	10	2/15/47	88	Cath	Unemployed	3	10	18	2+ 5	5	43
34	10	9/ 2/47	81	Prot	Wage Earner	18	15	20	5+10	6	74
35	9	9/16/49	127	Prot	Self Employ	29	10	28	4+ 8	11	96
36	9	2/ 8/49	120	Prot	Self Employ	35	17	32	5+ 8	22	119
37	9	3/26/49	117	Prot	Wage Earner	26	10	26	3+ 5	7	77
38	9	10/24/49	115	Prot	Wage Earner	27	23	30	2+ 6	9	97
39	9	12/24/48	113	Prot	Self Employ	37	18	24	7+10	8	104
40	9	8/26/48	100	Prot	Wage Earner	28	22	22	5+ 8	10	95
41	9	3/27/48	96	Prot	Unemployed	23	20	17	4+ 5	5	74
42	9	11/ 6/47	96	Prot	Professional	12	17	11	1+ 3	0	44
43	9	1/14/49	89	Prot	Wage Earner	12	22	24	3+ 3	1	65
44	9	2/ 9/48	87	Prot	Wage Earner	8	8	14	1+ 2	7	40
45	9	10/ 1/47	87	Prot	Wage Earner	27	16	25	3+ 9	2	76

APPENDIX B

GRADE CLASSIFICATION, BIRTHDATE, I. Q., RELIGIOUS
PREFERENCE, PARENT OR GUARDIAN OCCUPATION,
INDIVIDUAL TEST SCORES, AND TOTAL TEST
SCORES MADE BY THE RURAL MALE GROUP

APPENDIX B

GRADE CLASSIFICATION, BIRTHDATE, I. Q., RELIGIOUS PREFERENCE,
 PARENT OR GUARDIAN OCCUPATION, INDIVIDUAL TEST SCORES,
 AND TOTAL TEST SCORES MADE BY THE RURAL MALE GROUP

Sub- ject	Grade	Birthdate	I.Q.	Reli- gion	Parent Occupation	Word Assoc	Uses Test	Hidden Shapes	Fables Test	Make-up Problems	Total Score
1	12	12/19/45	119	Prot	Deceased	32	31	23	4+ 5	15	110
2	12	12/30/45	114	None	Agriculture	30	22	28	6+11	15	112
3	12	3/30/46	111	Prot	Agriculture	40	21	33	6+10	8	118
4	12	3/ 7/46	109	Cath	Agriculture	34	32	23	3+ 7	11	110
5	12	4/ 6/46	104	Prot	Agriculture	30	22	20	5+ 9	12	98
6	12	2/24/46	102	None	Agriculture	29	30	22	1+ 5	14	101
7	12	5/29/46	98	Cath	Self Employ	27	19	26	5+10	12	99
8	12	4/28/46	96	Cath	Agriculture	23	18	19	5+ 7	3	75
9	12	3/ 3/46	96	Cath	Agriculture	43	18	20	4+10	4	99
10	12	7/ 8/46	95	Cath	Agriculture	23	27	14	5+ 8	7	84
11	11	9/29/47	115	Prot	Agriculture	41	20	22	6+12	15	118
12	11	1/ 8/47	112	Cath	Agriculture	23	13	21	0+ 0	5	92
13	11	1/19/47	109	Cath	Agriculture	32	24	18	4+ 7	13	98
14	11	9/ 4/47	108	Prot	Professional	43	38	24	8+11	15	139
15	11	7/23/47	107	Cath	Agriculture	16	24	29	3+ 5	10	77
16	11	12/24/46	102	Prot	Wage Earner	28	33	20	7+10	18	116
17	11	9/ 3/45	96	Prot	Self Employ	9	19	11	2+ 6	11	56
18	11	2/19/47	93	None	Wage Earner	36	18	10	9+10	11	94
19	11	12/ 7/45	91	Prot	Agriculture	18	23	13	1+ 3	8	63
20	11	12/31/45	85	None	Wage Earner	28	13	- 4	1+ 5	5	48
21	11	3/12/46	85	Cath	Agriculture	10	10	13	0+ 1	3	37

APPENDIX B--Continued

Sub- ject	Grade	Birthdate	I.Q.	Reli- gion	Parent Occupation	Word Assoc	Uses Test	Hidden Shapes	Fables Test	Make-up Problems	Total Score
22	11	1/ 3/47	85	Cath	Wage Earner	30	20	23	5+12	9	99
23	11	12/14/46	81	None	Agriculture	16	19	23	5+10	7	80
24	11	7/ 4/47	80	Cath	Agriculture	23	24	13	2+ 8	7	77
25	11	1/ 8/47	78	None	Wage Earner	24	34	17	0+ 3	3	81
26	10	1/ 4/48	106	Prot	Agriculture	28	28	23	3+ 6	13	101
27	10	12/13/47	105	Cath	Agriculture	36	22	19	2+ 3	11	93
28	10	7/ 5/48	105	Cath	Agriculture	27	35	17	3+ 5	15	102
29	10	12/ 1/47	104	Cath	Wage Earner	19	28	27	3+ 7	12	96
30	10	12/ 7/47	101	Prot	Agriculture	29	27	18	5+10	8	97
31	10	9/ 1/48	98	None	Wage Earner	37	14	17	6+10	11	95
32	10	12/14/47	97	Prot	Agriculture	24	30	16	3+ 6	14	93
33	10	6/23/47	87	Cath	Wage Earner	9	9	5	1+ 6	8	38
34	10	8/12/48	82	Prot	Agriculture	14	21	6	1+ 3	0	45
35	9	11/23/48	127	Prot	Professional	40	40	28	6+11	23	148
36	9	3/12/49	121	Prot	Wage Earner	25	39	20	5+11	10	112
37	9	3/25/49	117	Prot	Wage Earner	37	40	34	3+ 9	12	135
38	9	8/29/49	115	Prot	Wage Earner	40	29	27	5+10	16	127
39	9	7/ 8/49	113	Prot	Agriculture	42	43	25	5+ 6	15	136
40	9	1/27/49	100	Cath	Agriculture	21	24	22	4+ 7	9	87
41	9	10/22/49	96	Prot	Agriculture	22	17	7	5+10	5	66
42	9	9/ 8/49	96	Prot	Self Employ	27	24	24	4+10	14	103
43	9	7/23/47	89	Prot	Wage Earner	43	21	10	3+ 7	13	97
44	9	3/22/49	87	None	Wage Earner	19	30	10	2+ 8	14	83
45	9	1/22/49	87	None	Wage Earner	31	24	18	2+ 9	8	92

APPENDIX C

**GRADE CLASSIFICATION, BIRTHDATE, I. Q., RELIGIOUS
PREFERENCE, PARENT OR GUARDIAN OCCUPATION,
INDIVIDUAL TEST SCORES, AND TOTAL TEST
SCORES MADE BY THE URBAN FEMALE GROUP**

APPENDIX C

GRADE CLASSIFICATION, BIRTHDATE, I. Q., RELIGIOUS PREFERENCE,
 PARENT OR GUARDIAN OCCUPATION, INDIVIDUAL TEST SCORES, AND
 TOTAL TEST SCORES MADE BY THE URBAN FEMALE GROUP

Sub- ject	Grade	Birthdate	I.Q.	Reli- gion	Parent Occupation	Word Assoc	Uses Test	Hidden Shapes	Fables Test	Make-up Problems	Total Score
1	12	1/29/46	125	Prot	Wage Earner	34	18	20	6+11	11	100
2	12	12/22/45	123	Prot	Wage Earner	26	28	28	6+10	13	111
3	12	8/14/46	107	Prot	Wage Earner	25	20	23	6+ 9	13	96
4	12	9/29/46	100	Prot	Wage Earner	27	16	26	3+11	6	90
5	12	2/23/46	99	Prot	Self Employ	25	21	5	4+10	5	70
6	12	10/ 8/46	96	Prot	Wage Earner	24	16	25	8+10	7	90
7	12	9/17/45	95	Cath	Self Employ	26	20	20	5+10	10	91
8	12	4/14/46	95	Prot	Wage Earner	10	7	20	8+10	8	63
9	11	2/ 2/47	125	Prot	Professional	35	21	29	7+ 9	7	108
10	11	7/13/47	113	None	Wage Earner	26	18	20	7+ 9	12	92
11	11	8/24/47	110	Prot	Wage Earner	24	16	21	4+10	5	89
12	11	11/ 3/46	110	Prot	Self Employ	26	16	26	9+11	3	91
13	11	3/15/47	108	Prot	Wage Earner	34	12	32	7+ 9	8	102
14	11	3/ 2/47	106	Prot	Wage Earner	30	21	14	5+ 6	7	83
15	11	8/19/47	105	Prot	Professional	23	4	24	3+ 5	5	64
16	11	11/17/47	104	Prot	Professional	36	19	20	8+11	10	104
17	11	10/ 6/47	102	Prot	Wage Earner	27	14	32	10+11	8	102
18	11	1/ 7/47	101	Prot	Wage Earner	31	14	20	3+ 9	9	86
19	11	5/12/47	95	Prot	Wage Earner	19	15	10	5+ 9	5	63
20	11	12/17/46	92	Prot	Professional	32	12	20	4+ 7	5	80
21	11	4/23/47	89	Prot	Professional	14	27	17	5+ 9	10	82

APPENDIX C--Continued

Sub- ject	Grade	Birthdate	I.Q.	Reli- gion	Parent Occupation	Word Assoc	Uses Test	Hidden Shapes	Fables Test	Make-up Problems	Total Score
22	10	9/20/48	119	Prot	Wage Earner	13	15	15	4+ 9	3	59
23	10	1/12/48	106	Prot	Wage Earner	31	26	14	3+ 8	6	88
24	10	5/22/48	106	Prot	Wage Earner	31	17	10	5+ 9	7	79
25	10	3/ 6/48	106	Prot	Self Employ	32	34	11	2+ 5	10	94
26	10	10/15/48	102	Cath	Wage Earner	26	25	17	4+ 5	6	83
27	10	7/17/48	98	Prot	Wage Earner	19	16	16	6+10	11	78
28	10	6/11/48	98	Prot	Wage Earner	25	7	17	5+ 7	6	67
29	10	11/26/47	99	Prot	Wage Earner	22	16	18	7+ 9	11	83
30	10	5/14/48	91	None	Wage Earner	21	19	12	5+ 9	1	77
31	10	4/ 8/48	90	Prot	Self Employ	21	17	8	4+10	12	72
32	9	1/ 7/49	131	Prot	Professional	31	22	21	4+ 8	12	97
33	9	11/22/48	117	Prot	Professional	36	30	21	4+ 8	20	120
34	9	1/26/49	109	Prot	Wage Earner	33	21	15	7+ 9	13	98
35	9	9/ 1/49	108	Prot	Professional	27	24	11	5+ 9	4	80
36	9	7/26/48	100	Prot	Wage Earner	22	23	16	2+ 8	6	87
37	9	2/13/48	96	Prot	Unclassified	17	20	19	3+ 7	5	71
38	9	7/26/48	90	Prot	Professional	23	23	20	5+ 9	17	97
39	9	3/11/49	88	Prot	Wage Earner	37	23	24	6+12	7	109
40	9	12/24/48	88	Prot	Wage Earner	18	27	8	0+ 4	5	52
41	9	1/16/49	81	Prot	Unemployed	5	17	9	0+ 0	1	32
42	9	8/ 2/49	70	Prot	Professional	25	13	11	7+10	6	72

APPENDIX D

GRADE CLASSIFICATION, BIRTHDATE, I. Q., RELIGIOUS
PREFERENCE, PARENT OR GUARDIAN OCCUPATION,
INDIVIDUAL TEST SCORES, AND TOTAL TEST
SCORES MADE BY THE RURAL FEMALE GROUP

APPENDIX D

GRADE CLASSIFICATION, BIRTHDATE, I. Q., RELIGIOUS PREFERENCE,
 PARENT OR GUARDIAN OCCUPATION, INDIVIDUAL TEST SCORES, AND
 TOTAL TEST SCORES MADE BY THE RURAL FEMALE GROUP

Sub- ject	Grade	Birthdate	I.Q.	Reli- gion	Parent Occupation	Word Assoc	Uses Test	Hidden Shapes	Fables Test	Make-up Problems	Total Score
1	12	8/ 4/46	125	Cath	Agriculture	40	22	27	7+11	13	120
2	12	8/ 9/46	123	Prot	Agriculture	37	20	15	5+11	10	98
3	12	11/27/46	107	Cath	Agriculture	33	29	26	4+10	15	107
4	12	2/11/45	100	Cath	Wage Earner	24	23	20	3+ 9	5	84
5	12	8/ 5/45	99	Cath	Agriculture	21	10	8	1+ 8	3	51
6	12	9/23/46	96	Cath	Agriculture	19	15	17	3+ 4	8	66
7	12	12/ 4/46	95	Cath	Agriculture	30	14	16	2+ 9	12	83
8	12	2/ 1/46	95	Cath	Self Employ	19	29	4	2+ 9	10	83
9	11	2/21/47	126	Prot	Wage Earner	41	71	21	6+ 5	20	164
10	11	7/19/47	113	Cath	Agriculture	43	26	24	6+ 9	20	128
11	11	9/ 4/47	110	Cath	Agriculture	25	22	10	2+ 9	8	76
12	11	4/20/47	110	Cath	Self Employ	27	19	33	4+10	11	104
13	11	5/ 3/47	108	Cath	Agriculture	32	28	21	6+11	21	119
14	11	7/22/47	106	Prot	Agriculture	41	22	32	8+ 8	15	126
15	11	9/10/47	105	Prot	Agriculture	40	19	21	6+ 9	9	104
16	11	7/20/47	104	Prot	Agriculture	17	13	10	4+ 6	7	57
17	11	4/24/47	102	Cath	Agriculture	25	16	18	5+10	8	82
18	11	8/10/47	101	Cath	Self Employ	25	28	20	8+ 9	9	99
19	11	7/ 4/47	95	Cath	Agriculture	27	20	19	6+11	15	98
20	11	12/11/46	92	Cath	Agriculture	22	17	14	2+ 7	8	70
21	11	12/26/45	89	Prot	Wage Earner	22	27	14	4+ 6	5	78

APPENDIX D--Continued

Sub- ject	Grade	Birthdate	I.Q.	Reli- gion	Parent Occupation	Word Assoc	Uses Test	Hidden Shapes	Fables Test	Make-up Problems	Total Score
22	10	10/18/48	118	Prot	Agriculture	22	16	25	4+ 8	4	79
23	10	5/23/48	108	Cath	Agriculture	33	27	24	5+ 8	14	111
24	10	7/20/48	106	Prot	Agriculture	48	30	17	8+10	13	126
25	10	9/23/48	103	Prot	Agriculture	24	20	21	5+ 7	9	86
26	10	7/19/48	103	Cath	Self Employ	31	26	25	7+11	8	108
27	10	6/25/48	102	Prot	Agriculture	28	41	17	3+ 9	13	111
28	10	1/29/48	99	Cath	Agriculture	22	42	27	7+ 9	9	116
29	10	11/ 3/47	98	Prot	Wage Earner	24	21	18	4+ 8	9	84
30	10	10/27/48	94	Prot	Wage Earner	27	17	16	0+ 1	4	65
31	10	4/12/48	90	Cath	Agriculture	16	17	9	4+10	10	66
32	9	3/19/49	131	Cath	Agriculture	37	34	32	6+11	9	129
33	9	9/23/49	117	Prot	Wage Earner	30	26	19	6+ 8	12	101
34	9	7/26/49	109	Cath	Agriculture	33	25	20	7+ 7	9	103
35	9	1/26/49	108	Cath	Self Employ	31	27	18	4+ 9	13	102
36	9	7/30/49	98	Prot	Agriculture	20	27	14	3+ 6	7	89
37	9	6/12/49	96	Prot	Agriculture	30	24	16	6+10	8	94
38	9	11/27/48	90	Cath	Self Employ	22	20	18	3+ 5	3	71
39	9	1/ 3/49	88	Prot	Agriculture	29	43	10	3+ 6	7	78
40	9	4/ 6/49	88	Prot	Agriculture	17	11	11	1+ 1	9	50
41	9	3/ 9/48	80	Prot	Agriculture	23	16	6	1+ 5	2	53
42	9	5/28/48	70	None	Agriculture	23	27	19	6+ 8	8	91

APPENDIX E

REPRODUCTION OF THE WORD ASSOCIATION TEST, USES FOR
THINGS TEST, FABLE TEST, AND MAKE-UP PROBLEMS
TEST WHICH WERE CREATIVE MEASURING
INSTRUMENTS USED IN THIS STUDY

NAME _____ AGE _____ GRADE _____ BIRTHDATE _____ SEX _____ DATE _____

WORD ASSOCIATION

Listed below are twenty-five words that have more than one meaning. In the space following each word, you should write down as many of the meanings as you can. The meanings need not be written out in full; writing down one word will usually do. For example:

BARK tree, dog, seal, boat

These four words bring to mind three different meanings for the word BARK: the outer covering of a tree; a certain noise made by some animals like dogs and seals; and a kind of boat. Notice that the meanings were not written out in full; only some words to remind us of these meanings were given. This is all you have to do.

Your score will depend both on the number of different words you write (in the example above this was four) and on the number of different meanings the words remind us of (in the example above this was three). So if you had time to write only two words for BARK, you would choose tree and dog, say, rather than dog and seal because the former words stand for two meanings but the latter words stand for one meaning.

When you are sure of what you are to do, you may begin.

1. ARM _____

2. BIT _____

3. BOLT _____

4. CAP _____

5. COIL _____

6. DUCK _____

7. FAIR _____

8. FAST _____

9. FILE _____

10. GRAVE _____

11. HOST _____

12. LEAF _____

13. MORTAR _____

14. PINK _____

15. PITCH _____

16. PLANE _____

17. POKE _____

18. POLICY _____

19. PORT _____

20. PUNCH _____

21. RAKE _____

22. SACK _____

23. STRAND _____

24. TACK _____

25. TENDER _____

NAME _____ GRADE _____ DATE _____

USES FOR THINGS

Listed below are five objects. Your task is to write down as many different uses as you can for each object. Several examples are given in each case. You will have approximately 15 minutes. Be sure to write down some uses for each object. Write down anything that comes to mind, no matter how strange it may seem.

1. BRICKS Build houses, doorstep, _____

2. PENCILS Write, bookmark, _____

3. PAPER CLIPS Clip paper together, make a necklace, _____

4. TOOTHPICKS Clean teeth, test cake, _____

5. SHEET OF PAPER Write on, make an airplane, _____

NAME _____ GRADE _____ DATE _____

FABLES

On the following pages you will find four short fables whose endings are missing. Your task is to make up three different possible endings for each story. One of the endings should be moralistic, that is, an ending which teaches a lesson about right and wrong conduct. The second should be humorous, that is, amusing or comical; and the third ending should be sad, that is, sorrowful or depressing. In making up the three endings try to imagine what the original author would have said, and write that.

Example

A grasshopper, that had merrily sung all the summer, was almost perishing with hunger in the winter, so she went to see some ants that lived near, and asked them to lend her a little of the food they had put by.

"You shall certainly be paid before this time of year comes again," said she.

"What did you do all the summer?" asked they.

"Why, all day long, and all night long too, I sang, if you please," answered the grasshopper.

"Oh, you sang, did you?" said the ants,

Moralistic: "Well, he who will not work shall not eat."

Humorous: "Now then, you can dance."

Sad: "Well, you'll just have to starve now."

Notice in the example that the moralistic ending has to do with whether or not it is right for a person to expect to live at someone else's expense without having worked himself. The humorous ending teaches no lesson but makes a play on the words "sing" and "dance," while the sad ending points to the unhappy outcome of the grasshopper's lack of foresight and planning.

Reread the example, and when you are more sure of what you are to do, go on to the four stories below.

1. The Mischievous Dog

A rascally dog used to run quietly to the heels of every passer-by, and bite them without warning. So his master was obliged to tie a bell around the cur's neck that he might give notice wherever he went. This the dog thought very fine indeed, and he went about tinkling it in pride all over town.

But an old hound said,

Moralistic: _____

Humorous: _____

Sad: _____

2. The Peacock and the Eagle

The peacock, spreading his gorgeous tail, stalked up and down in his most stately manner before an eagle, and ridiculed him for the plainness of his plumage.

"I am robed like a king," said he, "in gold and purple and all the colors of the rainbow, while just look at your plain coat!"

"Tut, tut!" said the eagle,

Moralistic: _____

Humorous: _____

Sad: _____

3. The Sensible Donkey

A soldier, in time of war, was allowing his donkey to feed in a meadow, when he was alarmed by a sudden advance of the enemy. He tried every means in his power to urge the donkey to flee, but in vain.

"The enemy are upon us," said he.

"And what will the enemy do?" asked the donkey. "Will they put two pairs of baskets on my back, instead of one as you do?"

"No," answered the soldier, "there is no fear of that."

"Why then," replied the donkey,

Moralistic: _____

Humorous: _____

Sad: _____

4. The Foolish Donkey

A man drove his donkey to the sea-side, and having purchased there a load of salt, proceeded on his way home. In crossing a stream the donkey stumbled and fell. It was some time before he regained his feet, and by that time the salt had all melted away, and he was delighted to find that he had lost all his burden.

A little while after that the donkey, when laden with sponges, had occasion to cross the same stream. Remembering his former good luck, he stumbled this time on purpose.

Moralistic: _____

Humorous: _____

Sad: _____

NAME _____ GRADE _____ DATE _____

MAKE-UP PROBLEMS

DIRECTIONS: Inside the booklet you will find a series of arithmetic problems. These problems are different from the ones that you are accustomed to doing because they contain more information than you need to get a single answer. In fact, the object of the test is to see how many different problems you can think of which might be solved with the information you are given. For example, you might be given the following material:

John makes extra money in the spring and summer mowing lawns for people in his neighborhood. Sometimes he has more lawns to mow than he can handle. At such times he usually gets help from his two younger brothers, Fred and Tom. Fred can average half as much work as John in the same time, and Tom can average a third as much as John. John is paid by the job, and the people who hire him do not mind how many others help so long as John pays them out of his earnings and sees that the job is done right. Mrs. Jones pays John \$9.00 a week to mow her lawn from the end of May until the middle of September, and John finds that he and his brothers can do the job in an hour and a half. Other neighbors pay John at the same rate as Mrs. Jones. Given this information, set up as many problems as you can involving John's working experience in the spring and summer, and that of his brothers.

In the space provided at the end of the paragraph, you might write any of the following problems, all of which might actually be worked following the information given. **DO NOT WRITE DOWN ANY PROBLEMS WHICH COULD NOT BE WORKED WITHOUT ADDITIONAL INFORMATION.**

1. What is a fair rate of pay for Fred and Tom?
2. How many lawns could the boys care for in an eight-hour day?
3. If the boys work 10 hours every Saturday, how much money would they earn from May to September?
4. How much faster does Fred work than Tom?

and so on. Note that you would not ask a question such as, "How much money should John get for contacting neighbors and arranging to cut their lawns?" since this could not be answered from the information given.

You should give as many problems as you can for each paragraph of information. Try to give some problems for every

paragraph rather than spending most of your time on just one or two paragraphs.

1. Mr. Smith decided to purchase a house whose cost was \$15,000. He made a down payment of \$5000, and agreed to pay the rest with monthly payments. Each monthly payment included a portion of the principal, an interest charge computed at the rate of 5 per cent per year, plus a charge for insurance which cost \$129.50 per year. Mr. Smith found by talking to the former owner that it cost an average of \$20 per month to heat the house. After he had owned the house for two years, he received \$3000 through an uncle's will which he applied to what he still owed on the house. A year later he purchased a new stove and refrigerator on time payments which added \$35 a month to his expenses. At the same time he added insulation to the house which cost him an additional \$30 a month for 18 months, but which the contractor who installed it guaranteed would reduce his heating costs by 15 per cent. Given this information, set up as many problems as you can involving Mr. Smith's expenses in connection with the purchase and operation of his home.

1. _____
2. _____
3. _____
4. _____
5. _____

2. The Park District of New City installs a swimming pool with a total capacity of 20,000 cubic feet. To fill the pool, two inlets with a potential of 20 and 10 cubic feet per minutes respectively are available. A single drain at the deep end of the pool will remove water at the rate of 25 cubic feet per minute. A circulating pump is provided which moves the water in the pool through a filtration system at the rate of 5 cubic feet per minute. When the filters become clogged and require cleaning, the pool attendant is instructed to open the drain half way and then to open the larger inlet valve just enough so that the level of water in the pool remains constant. When the pool is to be cleaned, as it is once every week, the water is drained and the side of the pool scrubbed. The draining and scrubbing together require 15 hours. Given this information, set up as many problems as you can concerning the operation of the pool.

1. _____
2. _____
3. _____
4. _____
5. _____

3. Jack and Phil are writing a paper for their science class about falling bodies. They conduct some experiments by throwing rocks from a cliff to see how far they will fall in a certain time. When the rocks are dropped straight down they obtain the following rate:

<u>Distance the Rock Falls</u>	<u>Time Required to Fall This Distance</u>
4 feet	$\frac{1}{2}$ second
16 feet	1 second
64 feet	2 seconds
144 feet	3 seconds

They notice that when they throw the rocks straight out on a level the rocks fall just as fast and hit the ground in the same total time, 4.5 seconds, as when they were simply dropped. When they throw the rocks into the air just high enough to go over the top of a certain tree standing at the edge of the cliff, it takes 9.5 seconds for the rock to fall to the bottom of the cliff. Given this information, set up as many problems as you can about Jack and Phil's experiment.

1. _____
2. _____
3. _____
4. _____
5. _____

4. Mark and George are making a survey for a problem in their social science class. They want to find out how much money people who live in the neighborhood right around the school pay for rent. They decide to ask everyone who lives in the eight blocks surrounding the school how much they pay. Mark goes to all of the houses in four of the blocks and

George to all the houses in the other four blocks. Of the 40 houses that Mark visits he gets answers from only 22 tenants; 14 tenants being away from home and 4 refusing to answer Mark's questions. George visits 34 houses, getting answers from 18 tenants. Three tenants refuse to answer George's questions and 13 are not at home. Mark finds that the average rent paid by his 22 tenants is \$85 per month, with the highest being \$135 and the lowest \$47.50. George finds the average is \$97.50 with the highest being \$155 and lowest \$75.00.

Since all of Mark's tenants live in apartment buildings managed by real estate companies, he calls the companies and finds out from them that the real average rent for all 40 apartments in his four blocks is \$90.00 per month. Given this information, set up as many problems as you can about Mark and George's survey.

1. _____
2. _____
3. _____
4. _____
5. _____

APPENDIX F

INFORMATION SHEET USED TO OBTAIN THE OCCUPATION
OF THE SUBJECTS' MOTHER AND/OR
FATHER OR GUARDIAN

NAME _____ GRADE _____ SEX _____ AGE _____ BIRTHDATE _____
 RELIGIOUS PREFERENCE _____

Please check the occupation of your mother and/or father or guardian.

	Mother	Father
Unemployed	1	1
Accounting	2	2
Agriculture	3	3
Architecture	4	4
Armed service	5	5
Art or arts & crafts	6	6
Auto & Airplane mechanics	7	7
Banking	8	8
Beautician or barber	9	9
Building trades (mason, electrician, carpenter, etc.)	10	10
Business administration	11	11
Chemist	12	12
Community service	13	13
Dental technology	14	14
Dentistry	15	15
Drafting	16	16
Electronics	17	17
Engineering	18	18
Government service	19	19
Homemaking	20	20
Industrial foreman	21	21
Journalism	22	22
Lab. technician	23	23
Law	24	24
Medical technology	25	25
Medicine	26	26
Metal trades & machine shop	27	27
Ministry or religious educ.	28	28
Music	29	29
Nursing	30	30
Pharmacy	31	31
Radio-TV	32	32
Retailing or wholesale trade	33	33
Salesmanship	34	34
Science Research	35	35
Secretarial	36	36
Social work	37	37
Teaching	38	38
Veterinary medicine	39	39
Retired	40	40
Deceased	_____	_____
Other (specify)	_____	_____