IDENTIFICATION AND EVALUATION OF CREATIVE ABILITIES OF STUDENTS IN THE AREA OF TEXTILES AND CLOTHING

By

MARY EVELYN BOAZ

Bachelor of Science in Home Economics
University of Arkansas
Fayetteville, Arkansas
1949

Master of Science in Home Economics
University of Arkansas
Fayetteville, Arkansas
1958

Submitted to the Faculty of the Graduate School of
the Oklahoma State University
in partial fulfillment of the requirements
for the degree of
DOCTOR OF EDUCATION
August, 1965

IDENTIFICATION AND EVALUATION OF CREATIVE ABILITIES OF STUDENTS IN THE AREA OF TEXTILES AND CLOTHING

Thesis Approved:

June Cozine
Thesis Adviser

Lela A. Nicole

Kathryn McGreenwood

Millie V. Pearson

Dean of the Graduate School

DEDICATION

The study, a humble tribute, is dedicated to Dr. Millie V. Pearson, Professor of Home Economics, retired June 30, 1965. Her untiring efforts to improve the home economics program and general education in the State of Oklahoma will be felt by students and teachers for years to come.

ACKNOWLEDGMENTS

The study was made possible through the cooperation and support of many persons. To each person who has assisted in any way, the writer is indeed grateful.

Special thanks is extended to: Dr. June Cozine, Head of Home Economics Education, for her contribution as Chairman of the Advisory Committee; Dr. Millie V. Pearson, Professor of Home Economics Education; Dr. Lela O'Toole, Dean of Home Economics and Mrs. Kathryn M. Greenwood, Associate Professor of Clothing, Textiles and Merchandising, for their contribution as members of the Advisory Committee; Dr. Harry K. Brobst, Director of the Bureau of Tests and Measurements, for his assistance and support; Miss Beatrice Kalka, Assistant Professor of Clothing, Textiles and Merchandising, in charge of the course Clothing, Textiles and Merchandising 202; students enrolled in this course during the spring semester of 1964; members of the Clothing, Textiles and Merchandising staff, Oklahoma State University; the selected professional persons who served as judges; teachers in attendance at the "Conference of College Teachers of Textiles and Clothing of the Central Region," 1964, for their participation in the study; many librarians at Oklahoma State University Library for their contributions by securing studies from other college and university libraries; Mrs. Laveene Cooper for typing the manuscript and Mr. Joe Hart for printing the manuscript.

Special appreciation is also extended to the General Foods Corporation for providing a generous fellowship.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

Description of the Study

The home in our American democratic society has changed from a production unit to one primarily of consumption. In the last year, Americans spent millions of dollars for goods which did not exist twenty years ago. For example, families bought nylon and Dacron clothing, enjoyed frozen foods, watched colored television sets and traveled across country by way of jet-aircraft. In short, the average American family enjoyed the progress generated by new ideas in industry. This change of activities in the home has been accompanied by a modified role of the American woman or homemaker which has important implications for educators of students in the area of home economics.

The modern home economist is very likely to still be engaged in the production of goods and the rendering of services related to the home but she has moved out of the home into the community to perform her task. She has joined the labor force, is paid a salary which she may use to purchase necessities for her own home and family. However, the most desirable education, training and preparation for this role may require the development of different kinds of abilities and talents than those at one time considered adequate for the student.

The privilege and responsibility of preparing the home economist for her role in our society belongs to college and university educators in home economics. A home economist has been defined by the American Home Economics Association as a person holding a Bachelor's or higher degree

from an accredited college or university in the area of home economics.[1] Educational agencies, industry, service agencies, research centers and all others employing home economists rely upon institutions of higher education for their source of trained people. At one time experience and a good memory were unfailingly reliable and valuable assets to the home economist in her work. Today, new knowledge is developing rapidly in every area of home economics and experience becomes obsolete almost as fast as it is accumulated. The modern home economist may no longer find it sufficient to rely only upon experience and memory; to continue to add the new knowledge to the old. Employers of home economists are interested in people with new and fresh ideas. As the profession tries to assimilate burgeoning new knowledge, there is a demand for people who can accept and adapt new methods and new relationships in solving pertinent problems and meeting the challenges of their position.

In a rapidly changing complex society, many educators are beginning to agree that there is not an existing body of knowledge that will serve the student in home economics throughout her life time. There is a necessity for preparing the student for life-long self education so that she can master facts as yet undiscovered and apply them to solving problems which educators can not yet foresee. Educators of today have the task of seeking those methods of guiding the student to develop to the fullest her potentialities which will enrich her own life and permit her to make needed contributions to the democratic society of tomorrow. The writer believes that an important factor influencing the success of the home economist of today is her ability to be creative in her work.

---

[1] Constitution and By-laws of the American Home Economics Association, Journal of Home Economics, LV (1963), p. 571.

The present study grew out of a concern for the development of the creative ability of students in one area of home economics. The staff of the textiles and clothing area of a home economics department in a teachers college recognized that little was known about creative abilities of students in this area. An interest in stimulating creativity of students enrolled in certain clothing classes lead to the following questions: What is creativity? Who has it? How does it reveal itself and how can it be coaxed to develop? Teachers of clothing courses strongly suspected that students enrolled in clothing courses requiring creative solutions to problems were falling short due to the lack of the development of this ability. Wide differences were apparent from one student to another in her ability to solve problems requiring unique solutions.

In order to plan learning experiences for the encouragement of creative ability of the student in the area of textiles and clothing, the staff realized a need for the formulation of an operational definition of creative ability and a method for the evaluation of the creative ability of students in this area. By an operational definition is meant precisely the kind of steps taken to assert that a student has creative ability in the area of textiles and clothing. These factors lead to the design of the study reported here.

Statement of the Problem

The study was exploratory in nature. There were two aspects to the study. The first aspect was concerned with the formulation of a working definition of creative ability of students in the area of textiles and clothing. The second aspect was a search for an appropriate evaluation instrument for identifying the student with creative ability in the area of textiles and clothing. More specifically, the study was an

attempt to identify and evaluate characteristics indicative of creative ability in the area of textiles and clothing.

Significance of the Study

The development of creative abilities as one of the major objectives of education has significant meaning for a democratic society as well as for the individual student of home economics. Practically all literature concerned with the education of women today refers to the social and political issues which have implications for change and new problems which must be faced and resolved by leaders in our profession.

Home Economics has been defined as a field of knowledge and services primarily concerned with strengthening family life through:

-educating the individual for family living
-improving the services and goods used by family members
-conducting research to discover the changing needs of individuals and families and the means of satisfying these needs
-furthering community, national, and world conditions favorable to family living[2]

The nature of home economics is unique in that it is an applied field and draws knowledge from its own research and from many other disciplines and applies it to improving the lives of families and individuals. Two of the disciplines, that of science and art from which home economics synthesizes knowledge, have been pioneering for some time in the development of creative ability among members of their professions. In regard to this Barron states:

> The act of imagination is their (scientists and artists) business. A scientific theory is an imagining of the way things could really be behind their appearances, expressed formally and accompanied by a set of rules whereby the goodness of the

---

[2]Dorothy Scott, et. al., Home Economics, New Direction, A Statement of Philosophy and Objective (Washington, 1959), p. 4.

> imagining may be appraised; a work of art is an expression of individual vision couched in a form which aspires to an audience...[3]

Besides these interests the recognition for the need of emphasizing creativity in education is evident by the representation of many professions from various countries throughout the world by the participants in the Creative Problem-Solving Institute. This Institute has been held annually for the past eleven years. Participants in the meetings have included educators, leaders in government, business, military officers, engineers, scientists, lawyers, journalists, and specialists in the field of health, welfare and religion. Their purpose has been to find ways of improving their own creative problem-solving ability as well as to transmit this know-how to others. The Creative Problem-Solving Institute is co-sponsored by the Creative Education Foundation, a non-profit foundation established in Buffalo, New York in 1954 solely for the purpose of encouraging a more creative trend in American education.

The members of the National Society for the Study of Education considered creativity important enough to include it as one type of giftedness in their Fifty-eighth Yearbook Education for the Gifted.[4]

The McKinsey Foundation for Management Research has attempted to keep continuously informed of pertinent research in progress at universities throughout the Nation. They donated a grant-in-aid which made possible a publication of summaries of a respresentative selection of the works of psychologists and psychiatrists on the subject of

---

[3]Frank Barron, "Creative Vision and Expression," New Insight and the Curriculum, Alexander Frazier, ed. (Washington, 1963), p. 285.

[4]Nelson B. Henry, ed., Education for the Gifted, National Society for the Study of Education, Fifty-Eighth Yearbook, Part II, (Chicago, 1959).

creativity.[5]

The vital need for creative individuals is evidently recognized by such organization as the Rockefeller Foundation, the Carnegie Corporation and the Ford Foundation which have supported research conducted by college and university educators who are interested in studying the nature of creativity. One such study has been conducted by the University of California under the leadership of MacKinnon.[6] Another study is being conducted by Starkweather at Oklahoma State University.[7]

One of the first educators to recognize the importance of the development of creative abilities of students was Zirbes. Zirbes states:

> Creativity has a vital significance in a time like ours, because of man's pressing need for adaptive, integrative, outlook in facing problems and conditions for which there are no patterns of precedents. Increasing insights into creativity are bound to have vital bearing on educational advances and reconstructions in years ahead, and there is a need for creative re-education, particularly for persons in status positions as leaders, who have responsibility in social change or educational advances. Spontaneity of interaction is one qualification for leadership. It can be cultivated creatively.[8]

More recently Dale, editor of The News Letter from Ohio State University has stated:

> In today's world creativity is not just a nice thing to

---

[5]Morris I. Stern and Shirley J. Heinze, Creativity and the Individual (Glencoe, 1960).

[6]Helen Rowan, "The Creative People: How to Spot Them," Think, Nov.-Dec., 1962, p. 7.

[7]Elizabeth K. Starkweather, "Developing Methods for Judging Potential Creative Abilities of Preschool Children," Research Reports, III (Stillwater, 1963). p. 1.

[8]Laura Zirbes, Spurs to Creative Teaching (New York, 1959). p. 3.

> have. It is a grave necessity. We need more innovation and invention, first to save the world from self-destruction, and second, to contribute to the mental health and power of individuals. Imitating the past is not good enough; only the creative society will survive.[9]

Apparently educators in many areas are becoming aware of the importance of research of all age levels. Much of the research reported has been on the value of creativity in regard to a profession. However, some authors have mentioned that the increasing hours of leisure enjoyed by the American people today need to be matched with fuller and more equitable provisions for creative, non-exploitive uses of leisure.

A seven-year study of the personality characteristics of creative individuals reveals at least three somewhat different types of creativity.[10] Although many like qualities were observed between the three groups, the differences found would indicate that educational curriculum for the development of creativity in each profession be based upon research which would reveal the creative abilities peculiar to that area.

One major factor determining the direction of home economics in the future is the kind of educational experiences provided the college students of today. Unforeseen problems threaten our profession range in scope from conflicts of cultures and consequent classes of value systems to technological revolutions and unceasing political upheavals. Surely if the creative mind does operate in such a way as to allow an individual to gain insight into new relationships between objects, facts

---

[9]Edgar Dale, ed. "Education for Creativity," The News Letter (The Ohio University, XXX. [Columbus, 1964]), p. 1.

[10]Helen Rowan, p. 8.

and ideas, then it seems crucially important that educational experiences be stressed which will encourage the growth of creative personalities.

Due to the fact that the writer was unable to locate any published research studies concerning the development of creative ability in the area of textiles and clothing, the emphasis being placed upon the importance of creativity by many professions today, and her own interest in the subject the author believes this to be a significant problem of home economics today and designed the study with the following purposes in mind.

Purpose of the Study

The study was concerned with the following purposes:

(1) To determine whether the development of creative ability of the student is one of the objectives for the textiles and clothing programs represented in the study.

(2) To determine whether there is a consensus of opinion of characteristics which are indicative of the creative student in textiles and clothing held among a selected group of college teachers.

(3) To explore the validity of selected evaluation instruments for the identification of creative abilities of a student in the area of textiles and clothing.

Definition of Terms

The following terminology will be accepted for the purpose of the study.

Behaviors

Behaviors include three levels of behaviors - cognitive, affective and psycho-motor.

Creative Behavior Inventory

Creative Behavior Inventory was an evaluation instrument developed for use by individual students to evaluate selected behaviors that describe their creative abilities. The student was presented with a set of statements printed one to a card. He was asked to arrange the statements in a distribution according to the extent to which each statement described himself.

Creative Personality Scale

The creative personality scale is an evaluation instrument measuring personality factors associated with creative behavior. It is one of fourteen scales composing the Opinion, Attitude and Interest Survey developed by Benno G. Fricke.[11]

Creativity

Creativity refers to the idiosyncratic perception of new intellectual relationships never before experienced by the individual between two or more stimuli.[12]

Graves Design Judgment Test

The Graves Design Judgment Test is an evaluation device measuring certain components of aptitude for the appreciation or production of art structure.[13]

Opinionnaire of Characteristics Indicative of Creative Abilities

Opinionnaire of characteristics indicative of creative abilities is an evaluation device used by faculty members to rate behaviors indicative

---

[11]Benno G. Fricke, Opinion, Attitude and Survey Handbook (Ann Arbor, 1963), p. 3.

[12]Robert W. Scofield, Psychology 443, Class Lecture, Oklahoma State University. (Stillwater, 1964).

[13]Maitland Graves Design Judgment Test Manual (New York, 1948), p. 1.

of the creative ability of the student in the area of textiles and clothing.

Potential Creative Ability

Potential creative ability is that which exists in possibility or the kind of development an individual's power could be.

Talented Student

Talented student is one who shows consistently remarkable performance in any worthwhile line or endeavor.[14]

Basic Assumptions

There are several basic assumptions seemingly taken for granted by many researchers in studies concerning creativity. Yamamoto[15] has stated three which will be accepted for this study:

1. The abilities involved in being creative are universal and these abilities may be cultivated by adequate educational procedures.

2. Creative abilities are expressed in the daily life of an individual by their behaviors, personality traits or observable characteristics such as their "invention, discovery, curiosity, imagination, experimentation, exploration" and etc. as well as by-products produced by an individual such as their "scientific inventions, theories, improved products, novels, poems, designs, paintings, drama and the like."

3. The behaviors, personality traits, or observable manifestations of the creative individual may be observed and evaluated by various

---

[14]William Heard Kilpatrick, "A Philosophic Viewpoint and A Suggested Program," Programs for the Gifted, The Fifteenth Yearbook of the John Dewey Society, (New York, 1961), p. 43.

[15]Kaoru Yamamoto, "Creative Thinking: Some Thoughts on Research." Exceptional Children XXX (1964), p.404.

instruments of observation and/or assessment.

Yamamoto warns that as more research findings are released revealing the nature of creativity, these assumptions may need to be re-examined and re-structured. In the meantime he states that it is well to remember that many investigations are based upon unstated and untested assumptions.

In the development of the design of this study the listed assumptions appeared to be basic to the following hypotheses.

Hypotheses of the Study

The hypotheses to be tested in the study are:

(1) The development of creative ability of students is one objective of the textiles and clothing programs represented in the study.

(2) A consensus of opinion of characteristics indicative of creative ability of a student in the area of textiles and clothing may be obtained from a selected group of college teachers.

(3) The creative ability of students in the area of textiles and clothing may be identified by their scores on a valid evaluation instrument.

Delimitation of the Study

The recognition that all necessary information required to effectively plan a college program for the maximum development of creative ability of the student in the area of textiles and clothing could not be included lead to a logical conclusion to limit the study to:

(1) Determining if the development of the creative ability of students is one of the educational objectives for textiles and clothing programs included in the study.

(2) Formulating a working definition of creative ability of students in the area of textiles and clothing.

(3) Studying the effectiveness of selected evaluation devices for identifying the student with creative ability in the area of textiles and clothing. The generalizations and conclusions drawn from the results of the Opinionnaire of Characteristics Indicative of the Creative Student pertained to textiles and clothing programs represented in the study. The selected group of teachers responding to the Opinionnaire was limited to the college teachers in attendance at the "Conference of College Teachers of Textiles and Clothing in the Central Region," held in Chicago, October 28-31, 1964.

The generalizations and conclusions drawn from the findings of the study of evaluation devices for identifying the student with creative ability in the area of textiles and clothing will be limited to a select group of students at Oklahoma State University.

General Procedures

The general procedure of the study was concerned with the exploration and interpretation of creative ability of the student in the area of textiles and clothing and its importance in the educational system of a democratic society. There were two general aspects of the study. The first aspect was concerned with the formulation of a working definition of creative ability of students in the area of textiles and clothing. The second aspect was a study of construct validity of selected evaluation instruments for identifying the student with creative ability in the area of textiles and clothing.

The first dilemma in solving the problem was to find a suitable definition for creativity. A search through psychological literature

revealed that creativity had been defined in myriad ways by researchers and that no single definition could include all the meanings which have been attached to it. Therefore, a definition was chosen which most nearly expressed what the writer had in mind. The chosen definition of creativity guided the selection from research reports of behaviors, personality traits and characteristics to appear on the Opinionnaire of Characteristics Indicative of the Creative Students used for the collection of data for the first aspect of the study. The Opinionnaire was constructed for the purpose of obtaining a consensus of opinion of characteristics indicative of the creative student in the area of textiles and clothing from college teachers attending the "Conference of College Textiles and Clothing Teachers of the Central Region," held in Chicago, October 28-31, 1964. Information was also sought to determine if the development of creative ability of the student in the area of textiles and clothing is an educational objective of the college programs represented in this study.

The data were collected, tabulated, analyzed and interpreted. A working definition of the creative ability of students in the area of textiles and clothing was formulated from the findings of the data provided by the Opinionnaire. The working definition formulated in the first aspect of the study provided the bases for the construction of an evaluation instrument, the selection of two evaluation instruments and the development of the subjective criterion necessary for the second aspect of the study.

In the second aspect of the study, the three evaluations instruments were tested for construct validity by comparing each with a subjective criterion. Data for the development of the subjective criterion were obtained from teacher's rating of the creative ability of students from

evidences exhibited in the students' products. Members of the course Clothing, Textiles and Merchandising 202 "Fashion Sketching," Oklahoma State University, spring semester, 1965, provided the population for the second aspect of the study. The data were collected, tabulated, analyzed and interpreted. Conclusions were drawn from the results of the study. Implications were made concerning further research. The study was reported in written form.

CHAPTER II

SUPPORTING EDUCATIONAL BELIEFS

One of the functions of the American college is to prepare a student to live in a democratic society. In our American tradition democracy stresses respect for the individual person. Fromm states:

> Mental health of man is characterized by the ability to love and to create, by the emergence from incestuous ties to clan and soil, by the sense of identity based on one's experience of self as the subject and agent of one's powers, by the grasp of reality inside and outside of ourselves, that is, by the development of objectivity and reason.[1]

Fromm points out that this is essentially the outlook which has been voiced by thinkers and great religious leaders throughout history. The good life in our democratic society is equated with the ability of man to develop himself and to improve the society around him. In regard to the purpose of education in the democratic society Kilpatrick has stated:

> The aim of education in a democracy is to help each pupil develop to the fullest that which in him lies, for both his own happiness and the common good.[2]

The above quotation suggests to the writer that the educator accepts the student as he is and helps him to develop into a growing, self-directing, responsible, and creative personality for the common good

---

[1]Erich Fromm, The Sane Society (New York, 1955), p. 69.

[2]Kilpatrick, p. 39.

of society. Each person will not enter college with the same degree of achievement or with the same potentiality. The individual differences among college students will manifest themselves in various ways. One way in which college students differ from the other is in kind and degree of talent or giftedness which the individual may possess. One particular type of talent or giftedness may be labeled "creativity." It is the belief of some authorities that much potential creative ability of the college student is not being recognized or encouraged. As a result the student may perform very poorly academically or leave college prior to graduation. In either case he does not develop to the fullest the potentiality which would enrich his own life and permit him to make needed contributions to a democratic society.

However, at the present time, educators are showing an increased interest in the development of the student with high creative abilities. Some have been concerned with philosophical theories concerning the nature of creativity and the implications these theories have for educational practices. Others have conducted quite extensive research for the purpose of gaining knowledge about the creative individual.

The Nature of Creativity

An age-old issue which serves as a source of debate among educators today is whether or not creative talent can be developed through educational experiences or if it is an inborn trait lying outside the realm of education. Some educational theories concerning the nature of creativity, which influence educators today, had their beginning with the writings of Plato; others are more recent in orgin.

Hallman[3] has categorized the beliefs held by educators concerning the nature of creativity into four general theories: (1) the theory of supernaturalism, (2) the theory of neuroticism, (3) the theory of genius and (4) the theory of naturalism. A summary of each of the theories as described by him follows.

The theory of supernaturalism holds that the creative act is the work of a God. Hallman states that this theory of divine inspiration was formulated by Plato for the Western World. It postulates that Only God Himself, operating through specially chosen individuals, can produce original creations. Since the creative act radiates from God as its source, it is original, perfect, ineffable, and miraculous. Thus creativity can not be developed through educational experiences but comes as a divine gift from God. The only methods available for man to effect his own creative abilities are through meditation and prayer.

The educational views of Sorokin and Maritain are influenced by this philosophy. Sorokin[4] believes that a divine supraconscious power is the "fountain head of the greatest achievements and discoveries in all fields of human creative activity." This power is "above the conscious level," it is "supersensory-supernatural intuitive." It transcends the ego, however, the ego may be possessed by it. Ultimately unknowable, and operating in a spontaneous manner, this power can produce original creations.

---

[3]Ralph Hallman, "Can Creativity be Taught?" Educational Theory, XIV, (January, 1964), p. 15.

[4]Pitirim A. Sorokin, "General Theory of Creativity," Creativity and Psychological Health. M. F. Andrews, ed. (Syracuse, 1961), p. 5.

Maritain[5] argues the creative power depends upon the "recognition of the existence of a spiritual unconscious, or rather, preconscious, of which Plato and the ancient wise men were well aware, and the disregard of which in favor of the Freudian unconscious alone, is a sign of the dullness of our times." This theory denies any relationship between education and creativity.

The theory of neuroticism like that of supernaturalism stems from the writings of Plato. It is based upon the notion that the insanity of an individual is responsible for his creative acts. It is an attempt to explain how irrational powers can function in the creative process and do so in ways that are human. Therefore, this theory makes the individual the source of creativity rather than a God. However, the creative person is a very special kind of individual to be able to harbor such strange powers. His creative activities are unavailable for rational description. They are singular and unpredictable. For these reasons, the activities of the creative person can not be influenced by education. The Freudian[6] view that all artists are neurotic and that all cultural forms are substitute gratifications for neurotic repressions corresponds to this theory. The argument of Lombroso[7] that geniuses are insane also supports this theory. He believed that only on the ground of psychopathology can the irrational and involuntary qualities of the creative act be explained.

The theory of genius replaces divine inspiration and madness with

---

[5]Jacques Maritain, Creative Intuition in Art and Poetry (New York, 1953), p. 91.

[6]Sigmund Freud, Civilization and Its Discontents, James Strachey, ed., (New York, 1962).

[7]Cesare Lombroso, The Man of Genius (London, 1891).

intuition as the source of creativity. The unique intuitive capacity of the individual yields an immediate, nonrational knowledge of the world and its relationships. The direct knowledge conferred upon a genius frees him from rules, training, and the necessity of being educated for his work. Genius is untrainable; all of the labor and learning one may expend upon an activity cannot produce genuine novelty unless the spark of genius is present. Due to the special features of the creative process held by this theory creativity is limited to a restricted few normal, healthy individuals; namely the geniuses.

The word "genio" first appeared during the late Renaissance, according to Nahm,[8] for the specific purpose of describing the creative capacities of the outstanding artist of that period. By 1700, he says, the term included as a part of its meaning "the incomprehensible and mysterious creative force animating certain individuals."[9] Since this time the question of genius has interested many philosophers, artists and literary men. Perhaps Kant's analysis of genius has been one of the most influential. He insists that the creative capacity as found in the genius occurs as a natural process in individuals and that the genius gives the rule to art, but it is a special kind of rule which cannot be learned. Kant says genius cannot be taught but certain aspects of the creative process are educable. The sources of originality and spontaneity cannot be known but the materials which reveal creative qualities must be fashioned into intelligible products. The shaping of materials "requires a talent academically trained, so that it may be employed in

---

[8]Milton C. Nahm, The Artist as Creator (Baltimore, 1956), p. 128.

[9]Ibid.

such a way as to stand the test of judgment.[10] The writings of Kant paved the way for the most recently developed theory of creativity which is that of the naturalistic view. This theory advocates that creative abilities are natural, normal and common to all mankind, and therefore modifiable by environmental conditions. This would mean that creativity is a part of personality structure and subject to educative processes.

The naturalistic view of creativity had its beginning in the late nineteenth century. Freud, influenced by Darwin, regards man as a natural animal and in so doing discovers in him certain non-rational processes, certain drives and urges, certain tensions and conflicts which are capable of driving the organism to creative endeavor. He contends that all men are endowed with the same general psychological system. He seeks to reveal to rational intelligence those non-rational operations to explain how man's dynamism is sufficient to account for inspiration and to indicate how man's own technical capacities are able to forge his visions and dreams into objects which exhibit intelligibility and a common humanness. Thus the Freudian school explains creativity in terms of unconscious processes. The irrational elements in creativity are neurotic but belonging to the unconscious level of mind they are regarded as natural and human.

Maslow and others have contributed to the naturalistic theory the concept of fulfillment as creativity. Maslow's[11] theory is that

---

[10]Immanuel Kant, Critique of Judgment trans. by J. D. Meredity, Oxford, 1911, p. 168.

[11]Abraham E. Maslow. "Some Basic Propositions of a Growth and Self-Actualization Psychology." Perceiving, Behaving, Becoming: A New Focus for Education, 1962 Yearbook for the Association for Supervision and Curriculum Development, (Washington, 1962), Chapter 4.

self-actualizing, psychologically healthy people are of necessity creative and that their creativeness affects everything the person does. This equating of creativity with self-actualization, with the natural unfolding of human powers, with growth itself, means that to examine creativity is to explore the essential condition of man.

The Physiological and Biological Aspects of Creativity

The writer was unable to locate any report of research in the area of the physical sciences which is concerned directly with creativity. However, studies in both the physiological and biological sciences have been concerned with the physiological and biological basis of behavior. Studies as those concerned with the physical and chemical basis of motivation,[12] memory[13] and other behaviors may have implications which will greatly influence the explanation of the creative process. In regard to the significance of the research in this area by biological science Kety states:

> One can see a bright future in the study of the chemical processes in neural transmission - a work which has already begun; in the chemistry of memory, where interesting and heuristic hypotheses are developing, centered on the coding possibilities which the protein molecule offers; in questions like neural specificity - how nerve fibers or neurons find their proper peripheral and central connections even when transplanted to unlikely places; and in the whole range of chemical processes in affect and behavior. For such work the biochemist will have to become interested in neurophysiology, in neuroanatomy, and in the behavioral sciences....the science of biochemistry and biophysics have an assured and secure future in the study of the brain...if man is nothing more than the most magnificent

---

[12] James Olds, "Self-stimulation of the Brain" Science, CXXXVII (1958), pp. 315-324.

[13] E. D. Adrain and H. H. Jasper, eds., Brain Mechanisms and Consciousness, Brockwell, Oxford: 1954, p. 284.

> physicochemical engine which has ever been constructed....is it not obvious then that he or at least his behavior ought someday to be explained completely by physics and chemistry?[14]

Gerard adds:

> What is the neural basis for the striking quantitative differences between man and man in intelligence or in the several abilities which constitute intelligence or its component, imagination? Surely brain size as such is not the answer, as many studies have demonstrated. Perhaps absolute or relative size of the association areas would show better correlation with intelligence; or perhaps the richness of fiber connections and the architectural intricacy...as the more elaborate circuits make the better radios, large or small. And the factor of activity level is almost surely involved; not only the size and number of nerve cells but their rates of beat, maintained potentials, irritabilities; their functional vigor. This, in turn, depends on their composition....and on their metabolism; and this on the blood supply and the amount of oxygen and sugar it brings, on the salt and acid and other components of the tissue fluids, on particular stimulants or depressants, as the thyroid hormone or anesthetic drugs, and the like.... As the sets of facts are brought together the understanding will arise. Possibly from this direction we shall get a clue as to the finer differential between brains: what gives one man a vivid imagination but a poor memory, another an encyclopedia memory but dull imagination.[15]

Educational Assessments and Creativity

The concern of personnel in colleges and universities in regard to special abilities and educational achievements of students seeking admission to institutions of higher education as well as the growth and educational achievement of the college student has been demonstrated by the establishment of guidance centers, testing bureaus, grading systems, and other agencies and methods of evaluation. The prestige

---

[14]Seymour S. Kety, "A Biologist Examines the Mind and Behavior," Science, CXXXII, (1960), p. 1867.

[15]R. W. Gerard, "The Biological Basis of Imagination," The Creative Process, B. Ghiselin, ed., (Berkeley, 1952), p. 257.

that various standardized tests have held for their ability to identify intellectual giftedness and assess mental growth is evidenced by the point of view regarding certain intelligence tests held by Terman. Miles reminds us of Terman's challenge to education:

> ...to produce, if they can, another concept as effective as the I.Q. for the delimiting of a group of talent to include the most successful students, the best achievers in the academic world of human relationships and human endeavor generally.[16]

Thus, some of the standardized tests were almost unchallenged for a period of time.

However, recent research has made apparent a number of deficiencies of some of the traditional instruments commonly used in assessing mental functioning. Some of the deficiencies of traditional instruments reported include the: (1) emphasis on convergent, conforming thinking; (2) overemphasis on traditional academic values; (3) tendency to lump together talent, creativity, and conformity; and (4) types of test responses required. Claims have also been made that conformity has been factored into many of the personality tests.[17]

I. A. Taylor argues that the intelligence test is an invention of the western culture which selects and stresses the values important in the American society and that they are essentially concerned with how fast relatively unimportant problems can be solved without making errors. In another culture intelligence might be measured more in terms of how adequately important problems can be solved, making all the errors

---

[16]Catherine C. Miles, "Crucial Factors in the Life History of Talent," Talent and Education, E.P. Torrance, ed., (Minneapolis, 1960), p. 51.

[17]E. Paul Torrance, Guiding Creative Talent (Englewood Cliffs, 1962), p. 42.

necessary and without regard for time.[18] Others have criticized intelligence tests for their exclusive concern with traditional academic value systems which have little to do with life outside this system. Smillie[19] maintains that the limited conceptualizations of intelligence represented by the Stanford-Benet and the Wechsler tests obscure the unique and creative qualities of those who do not fit the patterns measured by the tests. The ability to memorize and to repeat arbitrary information is highly valued, and creativity, inventiveness, and originality are ignored.

The work of Ornstein[20] in an experimental science program lends some support to these criticisms. He reports that when students are taught science in such a way that they learn creatively, the traditional predictors lose some of their validity. For example, in comparing student scores on science tests throughout the course with their scores on the School and College Aptitude Test, Ornstein found that some of the average students scored higher on the science tests than many who were at the top of the School and College Aptitude Test. He concluded that the students whose School and College Aptitude Test scores did not correlate with their science scores were much better at memorizing facts and formulas (learning by authority) than at the analytical, intuitive thinking required by the new approach.

A short coming has been recognized by some educators in the practice of identifying and guiding gifted children by the traditional

---

[18] I. A. Taylor, "The Nature of the Creative Process," Creativity, P. Smith, ed., (New York, 1959), p. 54.

[19] D. Smillie, "Test and Definitions of Intelligence," Merrill-Palmer School, (Detroit, 1959).

[20] Jacob A. Ornstein, "New Recruits for Science," Parents Magazine, XXXVI (February, 1961), p. 42.

lumping together of talent, creativity, and conformity. Concerning the adequacy of one measure such as the I.Q. or a score on some scholastic aptitude test to represent the sum total of man's mental functioning Calvin W. Taylor states:

> To me it is highly inconsistent to conceive of the mind as being represented by a single score or even by only the handful of scores or dimensions presented in our current intelligence tests. The brain which underlies the mind is far, far too complex for us to hope that all of its intellectual activities can be represented by only one single score or by a handful of dimensions. To seriously utilize such an over-simplified picture might be considered an insult to the brain, to the human mind, and to the human being.[21]

McNeil[22] supports this idea with his argument that if the process of creativity requires unconventional thinking, it must be concluded that creativity and conformity are antithetical in nature and should not be combined into any single measure.

Certain types or forms of testing in terms of responses required have been thought by some educators to have limitations in identifying the creative students. LaBrant says:

> Mechanical tests (true-false, multiple-choice with only one "right" choice) with machine-scored ratings control entrance to many of our most highly respected institutions. We may live in a machine age, but machines will not invent the imperative human relations, the necessary weighing of values, the concessions, or the daring proposals we shall need; neither will machine-scored tests discover inventors and innovators[23]

---

[21]Calvin W. Taylor, "Identifying the Creative Individual," Creativity, E. Paul Torrance, ed., Second Conference on Gifted Children. (Minneapolis, 1959), p. 5.

[22]Elton.B. McNeil, "The Paradox of Education for the Gifted," Improving College and University Teaching," VIII, (Summer, 1960), p. 112.

[23]Lou LaBrant, "The Dynamics of Education," Saturday Review, XLII, (September 12, 1959), p. 28.

Hoffman[24] identified the following defects of multiple choice type of test:

> 1. They deny the creative person a significant opportunity to demonstrate his creativity.
> 2. They penalize those who perceive subtle points unnoticed by less able people, including the test-maker.
> 3. They are apt to be superficial and intellectually dishonest, with questions made artificially difficult by means of ambiguity, because genuinely searching questions do not readily fit into the multiple-choice format.
> 4. They too often degenerate into subjective guessing games in which the examinee does not pick what he considers the best answer out of a bad lot but rather the one he believes the unknown examiner would consider best.
> 5. They neglect skill in disciplined expression.

It is of interest to note the attacks made on personality tests by industry. Deutsch and Shea[25] report dissatisfaction of some popular personality tests on the grounds that conformity and adjustment have been factored into them and more often than not they screen out the truly creative individual.

The writings of Whyte has supported this criticism to some degree. For example, he gives the "ideal executive" profile of Sears, Roebuck on the Allport-Vernon-Lindzey, Study of Values. The highest point on the profile is economic and the lowest is aesthetic, with theoretical, social and political just about the middle compared with the norm groups. In some studies of the personality of the highly creative individuals[26] it is of interest to note that, of these factors, aesthetic and

---

[24]B. Hoffman, The Tyranny of the Multiple-Choice Test. (New York, 1961), pp. 37-44.

[25]I. Deutsch and Shea, Inc. Company Climate and Creativity (New York, 1959), p. 28.

[26]Donald W. MacKinnon, "What Do We Mean By Talent and How Do We Test for It?" The Search for Talent. College Entrance Examination Board (New York, 1960), pp. 20-29.

theoretical are the high points on the profile.

The analyization and experimentation of various standardized tests of intelligence and other human characteristics has resulted in a recognition among educators of many limitations in the measurement of certain factors considered to be of importance in the identification and assessment of the college student. However, this is not to say that factors measured by these tests are of little consequence.

Of considerable importance to the American college educators is the relationship between creativity and intelligence. MacKinnon reports that creative persons are intelligent, but need not possess unusually high native intelligence.

> There is no one-to-one relation between creativity and intelligence. The feeble minded are not creative. Yet it is also true that the most intelligent persons are not always the most creative.[27]

Guilford, whose conceptualization of the structure of the intellect has unusual breadth, indicates that creative performance is definitely related to intellectual ability. The reason that it may not appear to be is a result of the inadequacies of the measures of intellect commonly used. He states:

> The average test of this character is usually limited in its content to not more than ten of the intellectual factors, none of which is among the more creative, divergent thinking group.[28]

---

[27]Donald W. MacKinnon, "Characteristics of the Creative Person: Implications for the Teaching-Learning Process," Association for Higher Education. (Washington, 1961), p. 89a.

[28]J. P. Guilford. "The Relation of Intellectual Factors to Creative Thinking in Science," Conference on Identification of Creative Scientific Talent. Calvin W. Taylor, ed., (Salt Lake City, 1956), p. 71.

In regard to the importance of the role of certain factors measured by standardized tests he states:

> ...it becomes more apparent that, in the creative activity of everyday life, other abilities than those regarded as primarily creative also play roles to some degree. For example, is it not likely that a large vocabulary is desirable for the creative writer? Should not the developer of ideas in descriptive geometry be able to think readily in terms of visual-spatial arrangements? These two examples imply the usefulness of the factors known as verbal comprehension and spatial orientation, respectively. Norman C. Meier has also emphasized the finding that individuals with recognized artistic talents are unusually able to observe and to remember clearly things they perceive. This implies a high degree of the factor known as visual memory...The factor of auditory memory may play a similar role for the composer.
>
> Thus, a great number of primary mental abilities that would not be regarded as creative abilities nevertheless play their roles at times in creative work. We might say that minimal levels of such abilities are desirable, if not necessary, for success in various artistic activities.[29]

In order to identify and evaluate the abilities involved in the creative process, it is necessary to understand the nature of the creative process.

Tyler[30] suggests that student behaviors considered to be creative need to be defined if creativity is to be evaluated. After this has been completed, it is necessary to decide on ways to obtain evidences that these behaviors are possessed by the student.

If an evaluation device or method requires an individual to exhibit evidences of possessing creative traits or characteristics it could be used to identify students with these abilities.

---

[29]Ibid., p. 72.

[30]Ralph W. Tyler, "Evaluation in Teaching for Creativity," Creativity and College Teaching, W. Paul Street, ed., Proceedings of a conference held at Carnahan House, University of Kentucky, (Lexington, 1963), p. 93.

The attempts of educators to provide information concerning the nature of creativity, to identify the traits or characteristics indicative of the creative individual and to provide evaluation opportunities which would correct the recognized deficiences of standardized tests in identifying the creative student, have taken two different directions. There appears to be an interest in an effort to develop a more comprehensive concept of intellectual performance. There has also been much interest in the personality factors related to creativity.

Intellectual Aspects of Creativity

The writer was unable to find evidences that the learning process for the creative student is any different in nature from that of less creative students. The verb "to learn" is defined as:

> Anything--a thought, an attitude, a bodily movement, any phase or aspect of an experience--has been learned in the degree that it will stay thereafter with the learner to get back at the right time into his life experience to play there its appropriate part.[31]

In order to learn a thing the learner will have to live that thing.

> I learn what I live and I learn it as I accept it to act on. I learn it in the degree that I live it, in the degree that I feel it important for me and to my values and in the degree that it is interrelated with what I already know and value.[32]

Tyler[33] defines learning as "the acquisition by the student of ways

---

[31]Kilpatrick, p. 42.

[32]Ibid., p. 43.

[33]Tyler, p. 92.

of behavior, that is, ways of thinking, feeling and acting which he has not previously followed."

Though there does not seem to be evidence of a difference in the learning process of the creative and the less creative student some authorities believe that they represent two types of thinking processes. Guilford describing two kinds of thinking--convergent and divergent--said:

> Convergent thinking demands the ability to recognize, to remember, to solve by moving toward one right answer or some one answer that is more or less clearly called for. Divergent thinking emphasizes searching activities, with the freedom to think in different directions; it may call for the ability to invent or innovate.[34]

Guilford[35] conceives a single theoretical model that embraces all the intellectual abilities of an individual. The variety of activities or operations performed are categorized as follows: cognition, memory, divergent thinking, convergent thinking and evaluation.

He believed that the most conspicuously creative abilities are to be found in the general category of divergent thinking, with the exception of the factors of redefinition, which are in the convergent thinking category, and the factor of sensitivity to problems, which is in the evaluation category. He has suggested that although these represent ways in which the creative thinkers are to be distinguished from other thinkers, many other intellectual abilities may play roles from time to time in the creative person's work.

---

[34]J. P. Guilford, "Creativity," American Psychologist, V (1950), p. 453.

[35]J. P. Guilford, "Structure of Intellect," Psychological Bulletin, LIII (1956), pp. 267-293.

Torrance has defined creative thinking as:

> The process of sensing gaps or disturbing, missing elements; forming ideas or hypotheses concerning them; testing these hypotheses; and communicating the results, possible modifying and retesting the hypotheses.[36]

Bartlett[37] employs the term of "adventurous thinking" which he characterizes as "getting away from the main track, breaking out of the mold, being open to experience, and permitting one thing to lead to another."

Many participants and observers have described the creative problem solving experience in terms of the following four stages: (1) a period of preparation; (2) a period of incubation; (3) an illumination; (4) a period of verification. The period of preparation is characterized by such activities as: (1) defining the problem, (2) gathering data and materials, and (3) choosing a plan of action. This leads to the period which is called incubation. During incubation the unconscious mind takes over and continues working on the problem. This leads to the third period, illumination. This period is the moment of insight. It is the realization of the necessary solution to the problem. Following illumination is the final stage which is the period of verification. It is during this period that the creative individual applies his skills, craft, and intelligence to test the original insight and to revise and complete the problem.

---

[36]J. Paul Torrance, Guiding Creative Talent (New Jersey, 1962), p. 16.

[37]Frederick C. Bartlett, Thinking (New York, 1959).

Personality Traits of Creativity

In the personality aspect of creativity it appears that the tools and techniques for demonstrating relationships conclusively are not yet available. Nevertheless, researchers have reported findings that reveal a rather impressive area of agreement as to the kind of person a creative individual is likely to be.

A useful profile which may aid the educator in identifying the creative student may be drawn from the published findings of MacKinnon,[38] Rowan,[39] and others. MacKinnon's profiles are based on studies of mature, creative people who have already achieved recognition in three different areas: (1) creative writers and other artists, (2) research scientists and mathematicians, and (3) architects. These groups, he believes, represent three somewhat different types of creativity.

An important finding of this study is that the personality traits, characteristics of temperament and motivation of the highly creative individual play a powerful role in describing the highly creative individual. Though certain sharp differences were observed between the three types of creative individuals studied there was an extraordinary degree to which certain qualities were shared by all three of the groups studied. Whether or not the traits they possess exist in the potentially creative college student may be questionable. MacKinnon ventures the guess, however,

> ....that most creative students as well as students with creative potential have personality structures congruent with,

---

[38]MacKinnon, p. 89.

[39]Rowan, p. 7.

though possibly less sharply delineated than, those of mature creatives.[40]

According to MacKinnon the dominant characteristics of highly creative persons are: (1) independence of judgment; (2) originality; (3) perceptiveness and curiosity; (4) intuitiveness; (5) theoretical and aesthetic interests.

In regard to independence, MacKinnon states:

> Highly creative persons are not deliberately nonconformist. Instead they are genuinely independent...It is in their creative striving that their independence of thought and autonomy of action are revealed. But their independence of mind and nonconformity lies in the realm of ideas, rather than of behavior. They are relatively free from the more conventional restraints and inhibitions...inclined to recognize and admit self views which are unusual and unconventional and strongly motivated to achieve in situations which call for independence.[41]

MacKinnon further adds that most of the creative persons he has studied report an unhappy childhood and, after doing fairly well in high school, sometimes they are honor students, having difficulty in college because they were unable to pursue their own interests and, as a result, finishing with C-plus or B-minus averages. In writing of the trait of originality MacKinnon states that the creative persons prefer responses which are novel, but still adaptive to reality. The creative person seems always to look for a solution, but for a solution which is elegant. He not only is curious, but open-minded. He has a toleration for ambiguity and confusion. He very often seems disordered and full of anxieties as he weighs his experiences, his

---

[40]Donald W. MacKinnon, "Nature and Nurture of Creative Talent," American Psychologist, XVII (July, 1962), p. 491.

[41]Donald W. MacKinnon, "What Makes a Person Creative," Saturday Review. (February, 1962), p. 17.

information, in an attempt to fuse them all into an elegant solution. MacKinnon warns: "The creative persons often show more than an average amount of tension and turmoil."[42] However, the saving grace for the highly creative persons seem to be as stated by MacKinnon: "They also give evidence of ego-strength and adequate mechanisms of control."[43]

In regard to the characteristics of a creative person Rowan states:

> Certain adjectives to describe the creative individual immediately spring to mind. Independent is certainly one of them. Original is another. Flexible, open, nonauthoritarian, sensitive, is a certain meaning of the word. Playful - of all things. Intuitive. Energetic.[44]

Concerning the problem of the identification of the creative individual Simpson[45] states that one should look for a searching, combing, synthetic type of mind. Such concepts as curiosity, imagination, discovery, innovation, and invention are prominent in the discussions of the meaning of creativity.

Many authorities seem to agree that the highly creative person tends to show almost unanimously a strong intuitive quality. Of the trait of intuitiveness MacKinnon says:

> The creative person's preferred mode of perceiving is the immediate apprehending of the real as well as the symbolic bridges between what is and what can be.[46]

---

[42]MacKinnon, p. 16b.

[43]Ibid.

[44]Rowan, p. 8.

[45]R. M. Simpson "Creative Imagination," American Journal of Psychology, XXX (1922), p. 235.

[46]MacKinnon, p. 92.a.

The kind of creative person one is seems to have some bearing on how much he relies on his intuition. Creative artists rely to a great extent on intuition; creative scientists and engineers lean toward thinking; and architects seem to be divided in their preferences for thinking and feeling in their work or in seeking solutions.[47]

Congruent with the creative person's preferences for intuitive perception and thought seems to be his prizing of theoretical values. MacKinnon states:

> ....both orient the person to seek a deeper and more meaningful reality beneath or beyond that which is present to his senses. Both set one to seek truth, which resides not so much in things in themselves as in the relating of them, one to another, in terms of identities and differences and unifying principles of structure and function.[48]

The highly creative person seems to resolve any conflict between theoretical and aesthetic values. Many authorities seem to agree that these are two of the strongest values of a majority of creative persons. MacKinnon states: "The creative person is never satisfied with anything but an elegant solution. The aesthetic viewpoint permeates all the work of the creative."[49]

Allied to this is the creative person's preference for complexity, his delight in the challenging and unfinished, which evoke in him an urge to discover unifying principles for ordering and integrating multiplicity.[50]

---

[47]Rowan, p. 11.

[48]MacKinnon.

[49]Ibid.

[50]Ibid.

Another striking difference between highly creative individuals and the average person is that of perception. Rowan writes:

> The average person has a tendency to concentrate on things presented to their five senses, and they focus their attention upon existing facts. The creative person who perceives intuitively focuses upon possibilities, he looks expectantly for a link between something present and something not yet thought of.[51]

MacKinnon and others stress the fact that there are many paths along which persons travel toward the full development and expression of their potentiality. All creative people do not seem to fit into any single mold. However, these characteristic traits seem to play a most powerful role in the nature of the creative person.

Beliefs Basic to the Study

The theory which most nearly agrees with the beliefs upon which the study was built is that of the naturalistic point of view. The study was built upon the belief that creative abilities are natural, normal, widely distributed, general but unique human potentialities which can be developed through certain educational experiences. They are possessed to some degree by all people, and may be expressed through a variety of media in many areas. Zirbes states:

> Creativity manifests itself broadly in many diverse fields and aspects of human endeavor, and in diverse media, ways and forms, i.e. it is not limited to the arts nor to some special separate aspect of living.[52]

Some researchers have reported that the creative person is not a freak and that creativity is a common trait, which expresses itself more in

---

[51]Rowan.

[52]Zirbes, p. 3.

some people than in others.

Believing this it would seem reasonable to assume that textiles and clothing is an area in which a student may be talented and that educational experiences may be planned and instruction conceptualized which will allow the student to develop her creative abilities.

The definition of creativity accepted for the study was based upon certain beliefs held by the author. The psychological definition accepted is that: "creativity refers to the idiosyncratic perception of new intellectual relationships never before experienced by the individual between two or more stimuli."[53] This means that when a student unaided gets insight into a relationship between objects or facts which she has not known before, she has been creative. For example, if a student in clothing construction class has the problem of setting a sleeve into the armscye of an unfinished garment and she has never done this before, she has not seen anyone do this, she has not read how to do this, no one has told her how to do this but she successfully solves the problem by herself, she has been creative. This definition implies that both a process and a product may be involved in a creative act and that both the process employed by a student and the product produced by a student might give evidences of her creative ability. It also states that the insight gained by the student in a creative action is original to the student but not necessarily original to all others. Thus it would include the re-discovery of relationships between objects and facts as well as the production of something entirely new, thereby accounting for the originality and at the same time the commonness of creativity.

---

[53]Scofield, Class lecture.

Conceivably, creativity could be manifested in almost any activity concerned with the area of textiles and clothing. The example cited was selected because it illustrates the definition and because it is the belief of the writer that it is one technique most usually taught in an authoritarian manner. It is not a recommendation that students be required to independently solve the problem of setting a sleeve into a garment in all laboratory experiences. Neither should the student be penalized if she should successfully solve her problem in this manner. It should be noted that had not some creative individual previously solved problems in this manner, there would not be an authoritarian method to be taught. It is the belief of the writer that some students' talents lie in the ability to memorize, and to follow instructions but they may have a very dull imagination. Other students may have a poor memory and little ability to follow instructions but have a very vivid imagination and be very original in their work. The area of textiles and clothing needs individuals with a variety of talents. However, one type of desirable abilities of students should not be developed at the expense of the others. The creative student has been at a disadvantage for many reasons. Some reasons being the educators lack of an understanding of the creative process and the availability of methods of identifying and developing the student with high creative ability.

The beliefs of the writer interacting with the results of relevant research concerning creativity provided the basis for the design of this study and the contruction and selection of the evaluation instruments used for the collection of data.

CHAPTER III

IDENTIFICATION OF CHARACTERISTICS OF THE CREATIVE STUDENT

Creative ability of students in the area of textiles and clothing is not a readily observable trait. Therefore, in order to evaluate the creative ability of a student some criteria which would indicate that this quality exists needed to be formulated. According to Tyler[1] the first step in any evaluation process is to define the objectives which one hopes to achieve since the purpose of the appraisal is to ascertain how far the desired objectives are actually being realized. This necessitates the identifying and defining of the types of behaviors, traits or characteristics which would indicate that a student is creative. The need for a complete taxonomy of creative behavior was apparent but a search to locate such proved to be fruitless. A review of research literature on the topic of creativity revealed that various investigators could be studying quite different aspects of human behavior depending upon the operational definition used for the study and the specific explanations of the terms employed. Creativity appeared to have been used as a sort of generic term to cover many aspects of human behavior. Perhaps there is not a need for everyone to agree upon one strict definition of creativity; or perhaps the behaviors, traits or characteristics which indicate creativity in one profession may even differ from those

---

[1]June Cozine, "Evaluation--Meaning of Terms," Mimeographed Copy. Stillwater: Oklahoma State University, (June, 1959), p. 2.

of another area.

The results of some research indicate that the qualities that unite individuals with creative ability in different fields are more numerous and important than those on which they differ. However, the bulk of study of characteristics of the creative individual has been concerned with scientists, mathematicians, scholars of philosophy, writers and artists. The writer was unable to locate research results indicating whether or not the creative individuals in the area of textiles and clothing shared these general qualities or if there are certain characteristics peculiar to the creative person in this profession. Therefore, the first aspect of the study is concerned mainly with the formulation of an operational definition of creative ability of students in the area of textiles and clothing.

Hypotheses were made that: (1) a selected group of professional persons in the area of textiles and clothing would have in common the problem of the development of creative ability of students, and (2) a consensus of opinion of characteristics indicative of creative ability of students in the area of textiles and clothing could be obtained from this group. Therefore, the assumption was made that a basis for the formulation of an operational definition of creative ability could be obtained from a consensus of opinion of characteristics which were indicative of the creative ability of students held by a selected group of professionally qualified persons engaged in an effort to teach for the development of creativity.

The nature and scope of the information sought to test the cited hypotheses necessitated the cooperation of a professional group in the area of textiles and clothing and some satisfactory method of obtaining the desired information from the group.

The professional group selected to participate in this study was the teachers in attendance at the "Conference of College Teachers of Textiles and Clothing of the Central Region," held October 28-31, 1964. This group was selected because (1) they were college teachers in the area of textiles and clothing, (2) the fact that they were attending a professional meeting indicated an active interest in the area, and (3) due to the fact that the institution where the study was conducted is located in the central region of the United States.

The kind of information sought from the group suggested an Opinionnaire as a suitable instrument for obtaining the necessary data.

The Population

The college teachers attending the "Conference of College Teachers of Textiles and Clothing of the Central Region," held October 28-31, 1964 composed the population participating in this section of the study. There were 95 people in this group representing 70 institutions in 20 states located in the central region.

Development of the Opinionnaire

An Opinionnaire of Characteristics Indicative of Creative Ability was developed for the purpose of collecting data necessary to test hypotheses I and II. The Opinionnaire consists of four parts labeled A, B, C and D. Parts A, B, and C were developed to test hypothesis II of the study. Part D was developed to test hypothesis I.

No background context was provided in the Opinionnaire. Respondents were simply asked to respond in terms of their own opinions. However, in essence of time and to avoid respondent fatigue, a list of 20 characteristics and an explanation of each characteristic composed Part

A of the Opinionnaire. The respondent was asked to rate each characteristic according to whether he (1) completely agreed, (2) tended toward agreement, (3) was uncertain, (4) tended toward disagreement or (5) was in complete disagreement that the characteristic listed was an indicator of creative abilities of students in the area of textiles and clothing. The compilation of the list of characteristics appearing in Part A necessitated a preliminary selection of such characteristics from reports of research studies made of creative individuals. The selected list of characteristics was presented to six clothing, textiles and merchandising faculty members at Oklahoma State University for their opinions of whether each characteristic was indicative of creative abilities of students in the area of textiles and clothing. Characteristics viewed favorable by this group provided the basis for those appearing on the Opinionnaire. The list of characteristics and the explanation of each characteristic were studied, revised and a final selection was made of the 20 characteristics which appeared on the Opinionnaire.

Part B of the Opinionnaire was an open-ended type of item. The respondent was encouraged to list, give an explanation of and rate any characteristics not appearing under A which he considered to be indicative of creative abilities of students in the area of textiles and clothing. This section was included as an effort to discover any important characteristics omitted under A which were considered by the respondents to be indicative of creative abilities in the area of textiles and clothing.

Part C also asked for an unstructured type of response. This section was included as an attempt to detect any one characteristic considered to be synonymous with creativity or any pattern of a group of characteristics which appearing together would indicate creative ability

of students in the area of textiles and clothing.

Part D was for the purpose of determining if the population selected for the study was involved with the development of creative ability of students in the area of textiles and clothing.

Collection of Data

The basic method used for the collection of data was an Opinionnaire of Characteristics Indicative of Creative Ability which was prepared for this purpose.

The name and address of each college teacher attending the "Conference of College Teachers of Textiles and Clothing of the Central Region," held in Chicago, October 28-31, 1964 were obtained from a list of college teachers attending the Conference. A letter with the Opinionnaire enclosed was mailed to each college teacher whose name appeared on the attendance list. The letter explained the study and solicited a response to the enclosed Opinionnaire. (Appendix A) Letters and Opinionnaires were mailed to 95 college teachers representing 70 institutions of higher education in 20 states in the central region. Responses were made by 66 college teachers representing 50 institutions in 19 states in the central region. Sixty of the responses, representing 50 institutions in 19 states were usable in the study.

Treatment of the Data

The primary concern of the first aspect of the study was the formulation of a working definition of creative ability of students in the area of textiles and clothing to be used as a basis for the development of the experimental test, the selection of standardized tests and the subjective criterion which are the concern of the second aspect of the

study. Therefore, data collected from Part A, B and C of the Opinionnaire were analyzed with this objective in mind. A tabulation was made of the responses to Part D of the Opinionnaire. Since all respondents gave an affirmative response to this item no further treatment of the data was considered.

Responses to Part A of the Opinionnaire were summarized and are presented in Table I. Characteristics are listed on the left side of the table. Ratings are listed across the top. Numbers appearing inside the table represent the number of respondents giving a certain rating to each characteristic.

A list of characteristics added by respondents in response to B of the Opinionnaire, the explanations and the rating given to each characteristic appears in Table X.(Appendix B). There was not any one which appeared frequently enough to be further considered in the analyzation of the data.

Data received in response to Part C of the Opinionnaire were of three types. First an attempt was made to see if any one characteristic was synonymous with creative ability in the area of textiles and clothing. Responses made to this request were listed and tabulated in view of the number of respondents listing the same characteristic. The results appear in Table II.

Secondly and thirdly an attempt was made to detect any pattern of two characteristics appearing as a pair or five appearing as a group which might be considered as an indicator of creative ability of students in the area of textiles and clothing. Data resulting from responses to the second and third part of C of the Opinionnaire were tabulated to show the distribution of the responses given by each respondent. The results appear in Table III and Table IV respectively.

TABLE I

CHARACTERISTICS INDICATIVE OF CREATIVE ABILITY AS RATED BY 60 RESPONDENTS

Characteristic	Number of Respondents Rating				
	1. complete agreement	2. tend toward agreement	3. uncertain	4. tend toward disagreement	5. complete disagreement
Aesthetic	31	20	5	3	1
Clever	33	14	7	3	3
Conflict	2	9	20	13	16
Experimentive	41	14	4	1	0
Flexibility	40	16	2	1	1
Fluency of Ideas	42	14	4	0	0
Imaginative	51	7	2	0	0
Independent	27	25	5	2	1
Insight	29	18	10	2	1
Intelligent	1	17	20	13	9
Intuitive	19	27	12	5	1
Orderly	3	13	19	11	14
Original	49	11	0	0	0
Patient	8	11	21	15	5
Perceptive	30	21	7	2	0
Ego Strength	14	24	8	8	6
Preference for Complexity	8	16	21	12	3
Rebellious	0	8	21	6	25
Sensitivity to Problems	15	23	12	10	0
Uninhibited	23	21	9	5	2

TABLE II

CHARACTERISTICS LISTED BY 60 RESPONDENTS AS MOST INDICATIVE OF CREATIVE ABILITY

Characteristic	Number Responding
Original	9
Imaginative	8
Experimentive	6
Flexibility	6
Fluency of Ideas	6
Aesthetic	5
Sensitivity to Problems	4
Insight	2
Perceptive	2
Uninhibited	2
Ability to Visualize	1
Clever	1
Conflict	1
Curiosity	1
Ego Strength	1
Inventive	1
Independent	1
Intuitive	1
Self-expression	1
Freedom of Expression	1

Table III reveals very little agreement among the respondents of any two characteristics which as a pair are indicative of creative ability. Two pairs of characteristics listed by more than one respondent appear in Table V.

Table IV reveals that no two respondents agreed upon five characteristics as a group which are most indicative of creative abilities of students in the area of textiles and clothing.

Due to the lack of agreement among respondents of any one, two or five characteristics being indicative of creative ability in the area of textiles and clothing, consideration was given to the total responses of the 60 respondents of characteristics indicative of creative ability. The total responses were obtained by an accumulation of responses given

TABLE III

DISTRIBUTION OF RESPONSES LISTING THE CHARACTERISTICS CONSIDERED AS THE PAIR MOST INDICATIVE OF CREATIVE ABILITY

Respondent No.	Characteristics																	
	Aesthetic	Clever	Conflict	Experimentive	Flexibility	Fluency of Ideas	Imaginative	Independent	Insight	Interest	Intuitive	Modification of Ideas	Original	Perceptive	Preference for Complexity	Self-Control	Sensitive to Problems	Uninhibited
1	X												X					
2	X												X					
3	X												X					
4	X												X					
5	X												X					
6	X												X					
7							X		X									
8							X		X									
9							X		X									
10							X		X									
11				X									X					
12				X									X					
13				X									X					
14					X			X										
15					X			X										
16					X			X										
17	X	X																
18	X	X																
19	X	X																
20							X						X					
21							X						X					
22							X						X					
23				X										X				
24				X										X				
25				X	X													
26				X	X													
27				X		X												
28						X												X
29						X		X										
30	X						X											
31									X					X				
32							X			X								
33		X		X														
34		X			X													
35					X	X												
36						X								X				
37													X				X	
38								X		X								
39	X		X															
40						X											X	
41						X										X		
42		X			X													
43																	X	X
44						X							X					
45											X				X			
46							X				X							
47							X											X
48	X																	X
49							X					X						
50						X	X											
51	X							X										
52		X			X													
53				X			X											
54					X								X					
55													X	X				
56	X				X													
57		X					X											
58				X				X										
59					X		X											
60								X					X					
Total	14	8	1	11	12	9	16	8	5	2	2	1	17	5	1	1	3	4

TABLE IV

DISTRIBUTION OF RESPONSES LISTING THE FIVE CHARACTERISTICS MOST INDICATIVE OF CREATIVE ABILITY

Respondent No.	Characteristics																										
	Adaptable	Aesthetic	Clever	Common Sense	Conflict	Curiosity	Courage	Experimentive	Flexibility	Fluency of Ideas	Imaginative	Independent	Insight	Intelligence	Interest	Intuitive	Orderly	Original	Patient	Perceptive	Positive Ego Strength	Preference for Complexity	Receptive	Self-Control	Sensitive to Problems	Skill	Spontaneous	Uninhibited
1								X			X							X				X			X			
2									X	X	X							X							X			
3		X	X					X			X					X												
4		X	X								X							X								X		
5		X						X	X		X							X										
6									X		X							X		X					X			
7								X	X		X		X	X														
8		X							X	X								X						X				
9								X	X			X	X					X										
10		X			X			X			X									X								
11						X		X			X	X														X		
12			X			X		X				X		X														
13			X					X			X		X							X								
14		X						X										X		X								X
15		X						X	X		X	X																
16									X	X								X	X	X								
17												X	X					X				X						X
18		X	X								X								X									X
19			X						X	X				X				X										
20		X					X	X	X											X								
21			X					X				X						X			X							
22			X					X	X	X	X																	
23									X		X			X	X						X							
24			X									X	X					X							X			
25													X	X			X		X	X								
26									X			X	X					X							X			
27				X							X			X				X	X									
28								X	X									X							X			X
29								X			X								X		X				X			
30								X			X		X					X		X								
31								X			X		X	X														
32		X						X	X		X							X										
33								X	X	X	X								X									
34		X						X		X										X					X			
35		X						X				X						X		X								
36		X						X	X	X															X			
37			X						X		X									X								X
38		X	X							X	X	X																
39		X						X		X	X							X										
40		X								X	X		X					X										
41								X	X		X											X						X
42		X									X		X					X		X								
43		X									X	X						X										X
44		X								X	X						X	X										
45		X	X							X	X							X										
46											X	X		X		X									X			
47		X						X	X		X									X								
48										X	X					X				X							X	
49								X		X	X					X		X										
50			X					X					X								X							X
51		X								X				X						X					X			
52								X			X		X			X		X										
53								X	X		X							X				X						
54								X			X	X						X		X								
55		X						X	X		X					X												
56		X						X	X		X							X										
57										X			X			X				X					X			
58		X						X	X	X								X										
59		X	X					X	X																			X
60	X							X	X		X												X					
Total	1	26	14	1	1	2	1	36	26	18	39	13	14	9	1	7	2	31	6	17	4	4	1	1	12	2	1	9

to characteristics appearing in Table I, II, III and IV. Only responses appearing under ratings one and two of Table I, and responses appearing more than one time in Table II, III and IV were included in the total. Results of the total responses of characteristics indicative of creative ability made by the 60 respondents appear in Table VI.

TABLE V

PAIRS OF CHARACTERISTICS LISTED BY MORE THAN ONE RESPONDENT

Characteristics	Respondent's Listing
Aesthetic and Original	6
Imaginative and Insight	4
Original and Experimentive	3
Flexibility and Independent	3
Aesthetic and Clever	3
Imaginative and Original	3
Experimentive and Perceptive	2
Imaginative and Clever	2

Findings and Results

Findings in an exploratory study such as this seem to have a tendency to be numerous and complex. Such was obviously the case in the research reported here. However, for purpose of expediency and clarity at this point, these findings were summarized and analyzed primarily in respect to hypotheses I and II. More discussion will be given regarding the findings of the first aspect of the study in the final analysis.

The tabulation of the responses made to Part D of the Opinionnaire revealed that 100% of the respondents reported that one of the objectives of the clothing program in their department was the development of creative ability of students. Therefore, without further ado hypothesis I

TABLE VI

SUMMARY OF TOTAL RESPONSES MADE BY 60 RESPONDENTS TO CHARACTERISTICS INDICATIVE OF CREATIVE ABILITY

Characteristics	Number of Times Listed
Imaginative	121
Original	117
Experimentive	109
Flexibility	100
Aesthetic	96
Fluency of Ideas	88
Perceptive	76
Independent	73
Clever	70
Insight	68
Uninhibited	59
Sensitivity to Problems	58
Intuitive	56
Positive Ego Strength	53
Preference for Complexity	30
Intelligence	28
Patient	27
Orderly	16
Conflict	14
Rebellious	8
Curiosity	2
Self-Control	2
Skill	2

was accepted on the basis of complete agreement among the group of respondents that the development of creative ability of students is one objective of the clothing programs represented in the study.

There was not any one characteristic listed by a majority of the respondents as being most indicative of creative ability. The characteristic listed by the largest number of respondents as being most indicative of creativity was "originality." This was listed by nine persons representing less than one-sixth of the total respondents. "Imaginative" was second in popularity, being listed by eight of the 60 respondents. "Flexibility," "experimentive" and "fluency of ideas," tied for third place, each being listed by six respondents. "Aesthetic" was listed by five respondents and "sensitivity to problems" was listed by four respondents as being the one characteristic most indicative of creative ability. Other characteristics appearing were listed by only one or two respondents. Therefore, it was concluded that there was not sufficient agreement among the groups of respondents to consider any one characteristic as synonymous with creativity.

There was less agreement on the two characteristics as a pair, than there was on the one characteristic listed as being most indicative of creative ability. The two characteristics as a pair listed by the largest number of respondents as being most indicative of creativity were "aesthetic" and "originality." These two characteristics were listed by six individuals representing one-tenth of the total respondents. "Imagination" and "insight" were listed by four persons. "Originality" and "experimentive," "flexibility" and "independent," "aesthetic" and "clever," "imaginative" and "Original," received equal listing. Each

of these pairs was listed by three respondents. Other characteristics listed as a pair, as being most indicative of creative ability were listed by not more than one or two persons. It was concluded that the 60 respondents were not agreed upon any two characteristics as a pair most indicative of creative ability. The same five characteristics as a group which were most indicative of creative ability were not listed by any two of the 60 respondents. Therefore, it was concluded that there are not any five characteristics as a group which are agreed upon by the respondents as being most indicative of creative abilities in the area of textiles and clothing.

Five characteristics listed in Part A of the Opinionnaire were rated as being completely agreed upon by 40 or more of the 60 respondents representing a consensus of opinion of two-thirds or more of the total respondents. The characteristics rated by respondents as either "complete agreement" or "tend toward agreement" were combined. This combination revealed that two-thirds or more of the total "respondents agreed" or "tended toward agreement" that 11 of the 20 listed characteristics are indicative of creative ability. These 11 characteristics (in order of rank, beginning with the one listed by the largest number of persons) were: (1) originality, (2) imaginative, (3) fluency of ideas, (4) flexibility, (5) experimentive, (6) perceptive, (7) independent, (8) aesthetic, (9) insight, (10) clever and (11) uninhibited. Due to the fact that these 11 characteristics were rated individually and not in relation to each other, as a group they might not be most desirable combination for indicating creative ability of the student in textiles and clothing. For this reason a look was taken at the similarities and differences of the ratings of characteristics made by respondents to Part A of the Opinionnaire and characteristics listed as

responses to Part C. Interestingly enough there were many similarities and some differences. Responses to both Part A and C were considered in the final analysis of the characteristics indicative of creativity which represent the highest agreement of respondents.

A summary of rated and listed responses of characteristics indicative of creativity made by the 60 respondents revealed that six characteristics appeared in the upper one-third of the group. These characteristics (listed in rank of total responses beginning with the highest) were: (1) imagination, (2) originality, (3) experimentive, (4) flexibility, (5) aesthetic and (6) fluency of ideas. These six characteristics were accepted as those most highly agreed upon as being indicative of creative ability in the area of textiles and clothing. Therefore, Hypothesis II - that a consensus of opinion could be obtained from a selected group of professionally qualified persons - was accepted.

The operational definition of creative ability in the area of textiles and clothing thus formulated included the following characteristics: (1) aesthetic, (2) experimentive, (3) flexibility, (4) fluency of ideas, (5) imagination and (6) originality. This definition provided the basis for the selection of two standardized objective tests, the development of one objective test and the subjective criterion in the second aspect of the study.

CHAPTER IV

THE IDENTIFICATION OF THE CREATIVE STUDENT

A criterion for the identification and evaluation of creative ability of the college student is a recently recognized and difficult problem of many educators. Practically every study of creativity has involved a set of assumptions concerning the identification of the creative individual and his work. No one criterion has been used by all investigators. Criterion used in previous studies have been summarized by Stein[1] to include statistical definitions involving deviations on psychological tests; number of citations or number of lines devoted to a person in general texts, histories or biographies of famous people; judgments of professionally qualified people; generally acknowledged eminent; number of products defined as creative; and the pursuit of an activity, like painting or music, assumed to require creative behavior.

In the first aspect of the study a working definition of creative ability was formulated on the basis of a consensus of opinion of characteristics indicative of creative ability of students in the area of textiles and clothing, held by a group of professionally qualified persons. The six characteristics agreed upon by the selected group of qualified persons included: (1) aesthetic, (2) experimentive, (3) flexible, (4) fluency of ideas, (5) imagination and (6) originality. Accepting the finding of the first aspect of the study that the presence of these

---

[1]Stein and Heinze, p. 1.

characteristics indicate that a student has creative ability in the area of textiles and clothing leads to the problem of how can it be determined that a student possesses these characteristics and if so, in what degree are these traits present. Actually this means, how can the student with creative ability in the area of textiles and clothing be identified? An hypothesis was made that the creative ability of students in the area of textiles and clothing may be identified by their scores on a valid evaluation instrument.

To test the hypothesis a need for promising evaluation instruments and a method of testing the validity of the instruments was recognized. On the basis of the working definition of creative ability formulated, two standardized objective tests were selected and one experimental evaluation instrument was developed for the study. The working definition of creativity also provided the basis for the development of an evaluation instrument which guided the development of a subjective criterion whereby the dependability of the student's score on each evaluation instrument could be studied for the accuracy with which they identified the creative ability of the student. Two problems were posed: (1) the validity of the subjective criterion and (2) the validity of each of the objective evaluation instruments. Therefore, the second aspect of the investigation was actually a study of construct validity of selected evaluation instruments for identifying creative ability of students in the area of textiles and clothing.

In order to conduct the study, data were needed for the development and validation of the subjective criterion and the provision of student scores for testing the construct validity of the three evaluation instruments. The information sought necessitated the cooperation of: (1) two professionally qualified persons to participate in the

formulation of the subjective criterion and (2) a group of home economics students majoring in textiles and clothing from whom data could be collected for the subjective criterion as well as students scores for each of the evaluation instruments.

Population of the Study

The course Clothing, Textiles and Merchandising 202, "Fashion Sketching," provided the population for the second aspect of the study. Hereafter, this course will be referred to as CTM 202. It was composed of 20 home economics students majoring in clothing, textiles and merchandising at Oklahoma State University in the spring semester of 1965. The course provided opportunities for students to display and exhibit behaviors indicative of creative abilities in the area of textiles and clothing. Planned laboratory experience required the development of products by each student. Therefore, this population was suitable as a source for obtaining data concerning the creativity exhibited in the students' creative products, as well as for obtaining data concerning the creative process.

Approach to the Criterion Problem

Seldom, if ever, would it be advisable to accept a test at face value until some evidence is provided to insure that the test actually does the things that it is purported to do. The "degree to which an evaluation instrument serves the purpose for which it was intended" is known as the validity of the test.[2] In regard to the validity of an

---

[2]J. Stanley Ahmann and Marvin D. Glock. Evaluating Pupil Growth (Boston, 1963), p. 292.

evaluation instrument Ahmann and Glock state:

> Validity is clearly the most important characteristic of an evaluation instrument. No matter what other characteristic an instrument may possess, if it is not valid to an adequate degree it is of no value whatsoever.[3]

An evaluation instrument may have a variety of functions. One function is that of prediction, in which the "worth of the instrument is judged by the extent to which it accurately forecasts some behavior."[4] Due to the nature of the problem, the type of validity with which the study was concerned was that of construct validity. In order to explain the concept of construct validity, the term "construct" needs to be understood. According to Ahmann and Glock[5] "a construct is a human characteristic assumed to exist in order to account for some aspect of human behavior."

Thus in the case of creativity as defined in the study reported here an assumption was made that the six characteristics composing the operational definition of creative ability accounts for the behaviors indicative of creative ability by students displayed in the area of textiles and clothing. The obvious method of determining whether or not an objective test actually predicted the creative ability of students would be to compare test scores with the capacity for creative production demonstrated by the individual. In essence of time, the use of judges which is perhaps a less reliable but more rapid means of assessing construct validity of the evaluation instruments was employed.

---

[3]Ibid.

[4]Jum C. Nunnally, Educational Measurement and Evaluation (New York, 1963), p. 27.

[5]Ahmann and Glock, p. 297.

A rating scale, the Creative Product Rating Scale, (Appendix C) based on the formulated working definition of creative ability was developed to guide the judges in their ratings. The rating scale made four general requests of the judges: (1) to familiarize themselves with the formulated working definition of creative ability of students in the area of textiles and clothing, (2) to give a general rating of high, medium or low creativeness to each student, (3) to rate each students' products for the exhibition of each of the six characteristics and (4) to list characteristics indicative of the creative student not appearing in the formulated working definition. The Creative Product Rating Scale guided the judges in the development of the subjective criterion.

Selection of Objective Test

A study of available standardized tests was conducted for the purpose of selecting a valid evaluation instrument for identifying the creative student in the area of textiles and clothing. The objective of the search was to obtain a standardized evaluation instrument designed for measuring the same characteristics as those formulating the working definition of creativity. An evaluation instrument designed for measuring all six characteristics was not located. However, two standardized tests were selected for use in the study: (1) the Maitland Graves Design Judgment Test[6] designed to measure aesthetic judgment which is one of six characteristics considered to be indicative of the creative student in the area of textiles and clothing and (2) the Creative Personality Scale[7]

---

[6]Maitland Graves Design Judgment Test, p. 1.

[7]Fricke, p. 85.

designed to measure imagination, originality and the ability to reorganize ideas, which are three of the six characteristics.

The Maitland Graves Design Judgment Test was designed to measure "certain components of aptitude for the appreciation or production of art structure." The test measures the "degree to which a subject perceives and responds to the basic principles of aesthetic order - unity, dominance, variety, balance, continuity, symmetry, proportion and rhythm." The test consists of 90 items. Each item consists of two or three versions of the same abstract design. In each item one design was organized in accordance with the fundamental principles of art structure while the other design or designs violated one or more of these principles.

The theory on which the test was based is that "a subject's expression of design preference would prove to be a criterion for his aesthetic perception and judgment."[8] The explanation thus given relates to the aesthetic characteristic as described in the formulated working definition of creativity. Therefore, this test was selected for study.

The Creative Personality Scale is one of fourteen scales of the Opinion, Attitude and Interest Survey developed by Fricke. Fricke states "the basic criterion used in the construction of the creative personality was instructor nomination."[9] The characteristics defined as indicative of creative ability were "imagination and originality in thinking" and a "high capacity for reorganizing ideas."[10] Three of these characteristics are related to three of the characteristics identified as being indicative of creative ability in the area of textiles and clothing.

---

[8]Maitland Graves Design Judgment Test, p. 1.

[9]Fricke, p. 85.

[10]Ibid.

Therefore, this scale was selected to be used in the study.

Design of the Experimental Test

The experimental test designed was a self-report type of Creative Behavior Inventory. (Appendix D). The test was for the purpose of determining the self-perception each student held in regard to her own creative ability in the area of textiles and clothing.

To a limited extent it was modeled after the Q-Technique designed by Stephenson.[11] The experimental test consist of 54 self-referent statements. These statements were printed on cards, one statement to each card. Each statement reflects a behavior indicative of one of the six characteristics considered to be those of a creative student in the area of textiles and clothing. One-third of the statements indicated the presence of a high degree of one of the six characteristics; one-third represented a medium degree, and one-third represented a low degree. Thus an equal number of items concerning each level of each characteristic for each of the three areas of textiles, clothing and merchandising appeared on the test.

The statements were concerned with the processes of a student solving problems related to textiles, clothing and merchandising. For example, three statements, each representing one of three levels of the student's ability to be imaginative in the area of clothing construction might read as follows: (1) I often visualize an improved technique for solving a clothing construction problem, (2) occasionally I visualize an improved technique for solving a clothing construction problem (3) I

---

[11]William Stephenson, The Study of Behavior - Q-Technique and its Methodology (Chicago, 1955).

prefer to follow accepted methods of clothing construction.

Statement number one cited represents a high degree of imagination in clothing construction, statement number two represents a lesser degree and statement number three represents practically no imagination in the area of clothing construction.

Similar types of statements concerning each characteristic for each of the three areas of textiles, clothing and merchandising provided the items for the experimental evaluation instrument. These statements appear in Table XI. (Appendix D). Each of the statements was printed on a card which the student sorted to describe herself (the self-sort).

The student was asked to divide the cards equally into one of three groups: (A) Statements most descriptive of me, (B) Statements somewhat descriptive of me and (c) Statements least descriptive of me.

Scores of the evaluation instrument were based on responses to group A and C. In the A group statements representing a high degree of each characteristic sorted by the student to be "most like me" received the highest weighting of any items appearing in this group. Thus, the number of "high value" items sorted by the student into Group A was assigned a value of three. The "medium value" item appearing in Group A was assigned a value of one. The "low value" item appearing in Group A was assigned a value of zero. The scores of group C were rated with respect to the number of "low value" statements sorted by the students into this group. Statements representing a low level of the presence of each characteristics that were sorted into this group were assigned a value of three each. Statements representing a medium value of each characteristic that was sorted into this group were assigned the value of one each. Statements indicative of a high value of each characteristic sorted into this group were assigned a zero value. Thus, the higher the student's score on the experimental evaluation instrument the more creative ability

she perceived for herself. The highest score a student could make being 180.

Collection of Data

Four evaluation instruments, the (1) Creative Product Rating Scale, (2) Maitland Graves Design Judgment Test, (3) Creative Personality Scale, of the Opinion, Attitude and Interest Survey by Flicke and (4) Creative Behavior Inventory were the means of obtaining data for the second aspect of the study. These instruments were used to gather data from the 20 students enrolled in the course, CTM 202 "Fashion Sketching," at Oklahoma State University during the spring semester of 1965. As stated previously, this group was selected for the population of the study due to the fact that it afforded creative products of the students as well as an opportunity to study the creative process of problem solving.

The Creative Product Rating Scale guided the ratings of students by a team of judges. Two professionally qualified persons were selected to serve as judges on the basis of their experiences and training. These judges rated the student's creative ability as exhibited in a display of five products of each student.

The group of products were five fashion plates randomly selected from works completed by the students as laboratory experiences during the last six weeks of the course. An identification number was assigned to each group of student's products for use by the judges in indicating ratings. Both of the judges were college teachers in the Department of Clothing, Textiles and Merchandising at Oklahoma State University.

Ratings were made individually by each judge. The judges were then asked to meet together, compare rating made of student's products and to resolve any existing differences of judgments. The subjective data thus

obtained represented a composite rating of the judges and provided the criterion for the assessment of the construct validity of the three objective tests studied in the investigation.

The two selected standardized tests, (1) The Maitland Graves Design Judgment Test, (2) The Creative Personality Scale of the Opinion, Attitude and Interest Survey and (3) The Experimental Evaluation Instrument, (Creative Behavior Inventory) were administered to the members of the course CTM 202 in order to obtain students scores on each of these evaluation instruments.

Analysis of Data

The primary concern of the second aspect of the investigation was to study the validity of the students' scores on selected evaluation instruments as a means of identifying the creative ability of students in the area of textiles and clothing. Therefore, the data were treated with this objective in mind.

The subjective criterion was a composite rating of the judges concerning the creative ability exhibited by students' products. The composite ratings of each of the 20 students made by the judges in response to Part B and C of the Creative Product Rating Scale were tabulated in Table VII. The total scores in this table are the rating of the judges given in response to Part B of the Creative Product Rating Scale. In Part B of this evaluation instrument the judges were asked to give one of the three general ratings to each group of students' products on display according to whether they judged the products to exhibit high, medium or low creative ability of the student. In the body of the table under each of the six characteristics listed in the heading are the judges ratings of the degree to which the students' products exhibited

TABLE VII

RATINGS OF CREATIVE ABILITY OF STUDENTS BY SELECTED JUDGES

Student	Characteristics							Number of sub-scores agreeing with total
	Aesthetic	Experimentive	Flexible	Fluency of Ideas	Imaginative	Original	Total	
A	M	M	M	M	L	L	M	4
B	L	M	M	L	M	M	M	4
C	H	H	H	H	M	M	H	4
D	L	M	L	L	L	L	L	5
E	M	M	L	L	L	L	L	4
F	M	L	M	L	L	L	L	4
G	M	H	M	M	M	M	M	5
H	M	H	H	M	H	H	H	4
I	H	H	H	H	M	M	H	4
J	H	M	H	H	H	H	H	5
K	M	H	H	H	M	M	H	3
L	M	M	M	M	M	L	M	5
M	M	M	L	M	L	L	M	3
N	M	M	M	L	M	M	M	5
O	L	L	L	L	M	L	L	5
P	H	H	M	M	H	H	H	4
Q	H	H	H	H	M	M	H	4
R	M	M	M	L	M	M	M	5
S	L	L	L	L	L	L	L	6
T	M	M	M	M	M	M	M	6

each of the listed characteristics. The same ratings were used for each individual characteristic as for the general rating. The results listed in Table VII show the interrelationships of the six characteristics as rated by the judges, as well as the relationship of each characteristic to the general rating given each student on general creative ability.

The judges agreed that a characteristic not included in the working definition of creative ability of the student but which they considered to be apparent in the students' products and to be indicative of creative ability of students was "interpretive." "Interpretive" was explained by the judges to mean "the level to which an idea is developed."

The responses of the 20 students to the two standardized tests selected for the study were scored. The range of the student scores on the Maitland Graves Art Judgment Test and Creative Personality Scale were treated separately. Each group of students scores were ranked in order from the highest to the lowest score. The range of scores were then divided into three approximately equal groups representing the one-third highest scores, one-third medium scores and one-third lowest scores on each of the two standardized tests. Each student was assigned a high, medium or low rank depending upon the position of her test score. Only total scores were available for each of the standardized test. Therefore, this ranking was made on the basis of the students' total test score in each case. Results were tabulated in Table XII. (Appendix E).

The responses to the experimental test provided a total score based on total responses to the entire test, and for six sub-scores based upon students' responses to statements concerning each of the six characteristics. The same method of scoring was used for the sub-scores of each characteristic as for the total test score. For example, in order to obtain a score on the aesthetic judgment of a student, only the

statements concerning this characteristics were considered in arriving at the score. If a statement representing the presence of a high degree of "aesthetic quality" was sorted into the group of "most like me" a score of three was given to the student. If the statement representing a medium ability of "aesthetic quality" was sorted into the group of "most like me" a score of one was given to the student. If a low value statement concerning aesthetic ability of a student was sorted into the group of "most like me," a score of zero was earned. If a statement representing a low degree of aesthetic ability was sorted into the group of "least like me," a score of three was given, a statement representing a medium degree of aesthetic ability received the rating of one. A statement representing a high degree of aesthetic ability sorted into this group received a rating of zero. Scores determined in this manner were totaled to represent a student's sub-score for each of the six characteristics. The students' scores based upon their scores from the experimental test appear in Table VIII.

A major issue of concern in the findings of the second aspect of the study was the validity of the subjective criterion. Observation of the ratings of creative ability of students made by selected judges and reported in Table VII reveal considerable likenesses in the rating of each characteristic with the total rating. For any one student's ratings the fewest number of characteristics ratings in agreement with the total score was three of the six possible ratings. The highest agreement among the sum of the individual characteristics ratings and the total rating was six representing 100% agreement. The mode was four of the sub-scores agreeing with the total rating. Thus 18 of the total 20 ratings are

located on or above the mode. The fact that the sum of the ratings of the sub-scores tend toward agreement with the total rating lends some support to the validity of the subjective criterion.

In order to facilitate the analysis of data, a work sheet was prepared which brought together all of the data collected in regard to each student. Thus the judges ratings of students' products and the students' scores on each evaluation instrument appear in Table VIII.

A second area of concern was the degree to which the students' scores on each of the three objective tests are related to the subjective criterion. By observation of the data appearing in Table VIII a comparison is readily available between the objective test scores and the subjective criterion. The total scores of the three objective tests agreed with the total rating of general creative ability made by the judges as follows: (1) the Creative Behavior Inventory agreed with 14 of the 20 ratings made by the judges, (2) the Maitland Graves Art Judgment Test scores agreed with 10 of the 20 ratings made by the judges and (3) the Creative Personality Scale scores agreed with 7 of the 20 ratings of the judges.

A correlation was computed to determine the agreement of students' scores on each of the three objective evaluation instruments with the judges ratings of the creative ability of students. A weight of one for a high rating, two for a medium rating and three for a low rating was assigned to the judges' ratings and to the students' scores on each of the objective evaluation instrument. These assigned values were used to compute the validity coefficient for each of the objective tests. The formula used for this computation was $r = \frac{\Sigma xy}{\sqrt{\Sigma x^2 \Sigma y^2}}$. The results from this computation are shown in Table IX.

TABLE VIII

TOTAL RATINGS OF CREATIVE ABILITY OF TWENTY STUDENTS IN THE AREA OF TEXTILES AND CLOTHING

Students	Ratings of Judges							Creative Ability Inventory							Maitland Graves Art Judgment Test Total Scores	Creative Personality Scale Total Scores
	Characteristics							Characteristics								
	Aesthetic	Experimentive	Flexibility	Fluency of Ideas	Imaginative	Original	Total	Aesthetic	Experimentive	Flexibility	Fluency of Ideas	Imaginative	Original	Total		
A	M	M	M	M	L	L	M	M	M	M	L	L	L	M	M	L
B	L	M	M	L	M	M	M	L	M	M	M	L	L	L	L	L
C	H	H	H	H	M	M	H	M	M	H	H	M	M	M	M	L
D	L	M	L	L	L	L	L	L	L	M	L	L	L	L	L	L
E	M	M	L	L	L	L	L	M	H	L	H	M	M	M	H	H
F	M	L	M	L	L	L	L	L	M	H	M	L	L	M	H	H
G	M	H	M	M	M	M	M	L	L	M	L	M	M	M	M	M
H	M	H	H	M	H	H	H	M	H	H	H	M	M	H	L	H
I	H	H	H	H	M	M	H	M	H	H	H	M	M	H	M	M
J	H	M	H	H	H	H	H	M	H	H	H	H	M	H	L	M
K	M	H	H	H	M	M	H	M	M	H	H	L	L	M	L	H
L	M	M	M	M	M	L	M	L	H	H	M	M	H	M	M	H
M	M	M	L	M	L	L	M	H	M	M	L	L	L	M	M	M
N	M	M	M	L	M	M	M	L	M	M	M	L	M	M	H	H
O	L	L	L	L	M	L	L	M	L	L	L	M	L	L	L	H
P	H	H	M	H	H	H	H	L	M	H	H	H	H	H	H	H
Q	H	H	H	H	M	M	H	H	H	H	H	M	M	H	H	M
R	M	M	M	L	M	M	M	L	H	H	H	M	M	M	M	L
S	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L
T	M	M	M	M	M	M	M	M	M	L	L	L	L	L	H	L

TABLE IX

CORRELATION* OF OBJECTIVE TEST SCORES WITH THE SUBJECTIVE CRITERION

Objective Test	Validity Coefficient
Creative Behavior Inventory	+.72
Maitland Graves Art Judgment Test	+.07
Creative Personality Scale	+.08

$$*r = \frac{\Sigma xy}{\sqrt{\Sigma x^2 \Sigma y^2}}$$

The results shown in Table IX revealed that the validity coefficient thus computed was +.72 for the Creative Behavior Inventory, +.07 for the Maitland Graves Art Judgment Test, and +.08 for the Creative Personality Scale.

Results and Conclusions

The results of the second aspect of the study were derived from the responses of a selected group of students to three objective evaluation instruments and to judges' ratings of creativity exhibited by the students' products.

Items on the evaluation instruments which solicited these responses were based on the operational definition of creativity formulated in the first aspect of the study. Therefore, the validity of the results reported here are dependent upon the authenticity of this definition. The adequacy of the operational definition as a guide to rating the creative ability exhibited in students' products was supported by the fact that the judges listed only one additional characteristic not included in the working definition which they considered to be exhibited

in the students' products and indicative of creativity. The characteristic added was "interpretive" explained to mean "the level to which an idea is developed." A fair degree of validity was observed in the judges' ratings of creativity exhibited in the students' products. The sum of ratings for sub-scores in all cases was 50% or more agreed with the general ratings given by the judges to the group of students' products. The mode being four of the six sub-scores agreed with the total score. Thus 18 of the total 20 cases were located at or above the mode in regard to the agreement of sum of the sub-scores to the total score.

The amount of agreement between the individual ratings of each characteristic and general rating of the creativity exhibited in the students' products tended to support the validity of the subjective criterion.

Some interrelationships among the six characteristics composing the working definition of creativity were apparent in both the judges' ratings and the students' scores on the Creative Behavior Inventory. For example, the judges' ratings of the imagination of the student were identical to the rating given the student on originality for 18 of the total of 20 students. The students' scores on the Creative Behavior Inventory" were identical for imagination and originality for 16 of the total 20 students' scores. These and other likenesses of lesser degree supported the conclusion that there may be some interrelationships among the six characteristics combined in the working definition of creative ability of students in the area of textiles and clothing. However, results revealed that these six characteristics of the student are not interrelated to the degree that an assessment of any one characteristic is as accurate a measure of creative ability as the assessment of all six.

A computation of the correlation of the students' scores on each of the objective test with the subjective criterion revealed that the valid coefficient of the Creative Behavior Inventory was +.72, the Maitland Graves Art Judgment Test was +.07 and the Creative Personality Scale was +.08. Considering the nebulous stage of the isolation of the pertinent intellectual, personality and physiological factors contributing to creativity, it is perhaps not too surprising that the two standardized instruments selected did not demonstrate more value as predictors of creative ability of students in the area of textiles and clothing.

The students' scores on the Creative Behavior Inventory evaluation instrument showed a much higher correlation with the subjective criterion than the scores of either of the other two objective tests. This may indicate two things: (1) the necessity of clearly identifying and defining the characteristics to be assessed and (2) that there is enough independence between the six characteristics combined to form the operational definition of creativity to greatly impair the validity of test scores if only a single or a few rather than all six characteristics are assessed.

The Creative Behavior Inventory was the only one of the three objective evaluation instruments designed to assess all six of the characteristics included in the operational definition of creativity. The Maitland Graves Art Judgement Test was designed to assess only one of six characteristics and the Creative Personality Scale was designed to test only three of the six characteristics. A definition or explanation of the characteristics measured by the Creative Personality Scale was not available. Therefore, depending on the definition assigned these characteristics there was the possibility that this evaluation instrument was assessing different behaviors than those rated by the judges.

The hypothesis that creative ability of students may be identified by their scores on a valid evaluation instrument was accepted on the basis of the high validity coefficient demonstrated by the Creative Behavior Inventory instrument.

CHAPTER V

SUMMARY AND IMPLICATIONS

The development of creative ability as a major objective of education has significant meaning for our democratic society as well as for individual students in the area of textiles and clothing. Needs for the study grew out of the awareness that little was known about creative ability of students in the area of textiles and clothing. Some teachers strongly suspected that students enrolled in clothing courses requiring creative solutions to problems were falling short due to the lack of the development of students enrolled in certain clothing classes. This led to the following questions: What is creativity? Who has it? How does it reveal itself and how can it be coaxed to develop? If curriculum is to be planned for the development of creative ability of students in the area of textiles and clothing, these questions as well as others need to be answered.

The study was concerned with the exploration of creativity. There were two aspects of the study. The first aspect was concerned with the development of a working definition of creative ability in the area of textiles and clothing based upon a consensus of opinion of a selected group of professionally qualified persons. The second aspect was a study of construct validity of three objective tests for the identification of students with creative ability in the area of textiles and clothing.

The study was based on the following assumptions: (1) the abilities involved in being creative are universal and may be cultivated

by adequate educational procedures, (2) creative abilities are expressed in the daily life of an individual by his behaviors, personality traits or observable characteristics and (3) the behaviors, personality traits, or observable manifestations indicative of a creative individual may be observed and evaluated.

The lack of agreement among educators of a definition of creativity emphasized the necessity of an explanation of the term as it was applied to the investigation reported here. The definition accepted was derived from psychological context. Creativity as defined by Scofield refers to the idiosyncratic perception of new intellectual relationships never before experienced by the individual between two or more stimuli. This would mean that when a student, unaided, gains insight into a relationship between objects or facts which she has not known before, she has been creative. Conceivably, creativity thus defined, could be manifested in almost any activity. Therefore, the example cited of a creative approach to setting a sleeve into an unfinished garment was selected due to the fact that such an activity is seldom thought of as providing opportunity for the development of or as a medium for the expression of creative ability.

The study was based upon a belief that creative ability is a part of total intelligence, being a part of total intelligence it is a natural, normal, widely distributed, general but unique human potentiality which is possessed to some degree by all persons and may be developed through certain educational experiences. Students in the area of textiles and clothing may manifest their creative ability through various media. Thus a student may show creative ability as a model, a fashion designer, a fashion illustrator, a retail buyer, a pattern maker, or in other ways. The intellectual, personality and physiological traits common to all

highly creative students in various aspects of textiles and clothing and the characteristics which divide them are beyond the scope of the study.

A review of literature in relation to creativity revealed that much of the investigation which has been made was concerned with creativity as manifested in scientists, scholars of philosophy and history, writers and artists. Evidence from current research indicates that certain characteristics or personality traits are common to all types of highly creative individuals and that the qualities that unite them are more numerous and important than the ones on which they differ. This suggests that there is enough common ground among different types of creativity to talk about the general traits or characteristics that make for creativity in general. Operating on this theory the study was designed to test the following hypotheses: (1) the development of creative ability of students is one objective of the textile and clothing programs represented in the study, (2) a consensus of opinion of characteristics indicative of creative ability of a student in the area of textiles and clothing may be obtained from a selected group of professionally qualified persons and (3) the creative ability of students in the area of textiles and clothing may be identified by their score on a valid evaluation instrument.

Characteristics thought to be common to all creative individuals in general were selected from research literature to appear on an Opinionnaire for obtaining a consensus of opinion of characteristics indicative of creative ability in the area of textiles and clothing from a selected group of teachers. Opinions concerning the selected characteristics as being indicative of creative ability were obtained from six faculty members of Clothing, Textiles and Merchandising at Oklahoma State University.

The preliminary list was revised on the basis of suggestions from this group and appeared as Part A of the Opinionnaire of Characteristics Indicative of Creative Abilities. The Opinionnaires were mailed to 95 teachers who attended the "Conference of Textiles and Clothing of the Central Region," 1964. The respondents were asked to rate each characteristic listed to the degree to which the characteristic was indicative of the creative ability of students. The respondents were also asked to list and rate any characteristics not appearing as one of the listed characteristics which they thought were indicative of creative ability in the area of textiles and clothing.

An attempt was made to find any one characteristic synonymous with creativity, any two characteristics as a pair which are indicative of creativity or any group of five characteristics considered by the respondents to be indicative of creative ability in the area of textiles and clothing. The respondents were also asked to indicate whether or not the development of creative ability of students was an objective of the clothing program of their departments.

Tabulated findings of the Opinionnaire revealed an array of responses indicating much variance of the worth of each characteristic as an indicator of creative ability. The number of the 60 respondents rating each characteristic as "complete agreement" that it is an indicator of creative ability ranged from 0-51. Thus the highest agreement among respondents was on the negative side representing what was not considered a characteristic of the creative student. However, 5 of the 20 characteristics were rated by two-thirds or more of the respondents as "completely agreed."

Results showed that there was not any one characteristic listed by more than one-sixth of the total respondents as the one characteristic

most indicative of creative ability of textiles and clothing. There was even less agreement on the two characteristics as a pair which are indicative of creative ability. No two respondents listed the same five characteristics as the five most indicative of creative ability in the area of textiles and clothing.

The responses to the Opinionnaire revealed that the development of creative ability was an objective of each of the 60 textiles and clothing programs represented in the study.

The results of the first aspect of the study lead to the conclusions that: (1) the development of creative ability is one of the objectives of the textiles and clothing programs represented in the study and therefore, a common problem to this group (2) six characteristics were agreed upon by two-thirds or more of the 60 respondents as being indicative of creative ability of students in the area of textiles and clothing. Therefore, a working definition of creative ability was accepted to include the following six characteristics: (1) aesthetic, (2) experimentive, (3) flexibility, (4) fluency of ideas, (5) imaginative and (6) original. The operational definition thus formulated provided the bases for the second aspect of the study. Therefore, the validity of the findings of the second aspect of the study was dependent upon the authenticity of the working definition of creativity thus formulated.

The second aspect was a study of construct validity of three objective evaluation instruments for identification of the creative student. After the operational definition of creative ability of the student in the area of textiles and clothing was formulated there still remained the problem of some adequate method of identifying and assessing the creative ability of the student. The hypothesis to be tested was that the creative ability of the students may be identified by their

scores on a valid evaluation instrument. The testing of the hypothesis necessitated a method of obtaining a criterion and some students' scores on evaluation instruments thought to measure creative ability. Twenty students enrolled in the course CTM 202 "Fashion Sketching," Oklahoma State University during the spring semester 1965, were selected for the population. This group provided both a student product needed for obtaining the data for developing the criterion and they also were involved in the creative process of development of the products. Thus both types of data could be obtained from this group.

The criterion was obtained by a subjective method. Two professionally qualified persons served as judges and rated the creative ability as it was exhibited in a display of a group of five products of each student. The judges were guided in this endeavor by the Student Product Rating Scale, an evaluation instrument developed for this purpose. The evaluation instrument was constructed with a "built-in" validation feature. The judges were requested to do four things: (1) to become familiar with the six characteristics indicative of creative ability and the explanation of each, (2) to give a general rating on the basis of the creative ability exhibited by each group of students' products on display, (3) to rate each students' products for its exhibition of each of the six characteristics and (4) to list and rate any additional characteristic exhibited by the students' products and indicative of creative ability. The judges rated each student separately, then came together for a conference and resolved any differences in judgments. Therefore, the ratings of the judges reported were all composite ratings.

The subjective criterion thus obtained was considered to be fairly valid based upon the percentage of agreement of the rating of each

individual characteristic with the total rating of creative ability of the students.

Three objective tests designed to measure one, three and all of the six characteristics of the working definition of creative ability were administered to the 20 students of the course CTM 202. The Creative Behavior Inventory, a self-report type of evaluation instrument, was developed to provide the student an opportunity to evaluate selected behaviors that describe his creative ability. This was an experimental evaluation instrument designed to include behaviors to indicate the presence of each of the six characteristics accepted to be those of a creative individual.

The Maitland Graves Art Judgment was selected as one of the three objective test on the basis of its claim to measure the aesthetic judgment of the student. The explanation given of the behaviors involved were very similar to the way in which the aesthetic characteristic was explained in the formulated operation definition of creative ability. Thus, this test was designed to measure only 1 of the 6 characteristics.

The other test selected to be administered to the students in the course CTM 202 was the Creative Personality Scale of the Opinion, Attitude and Interest Survey developed by Fricke. This scale was designed to measure imagination, originality and the capacity of the student for reorganizing ideas. The characteristics to be measured also appear in the operational definition of creativity formulated in the first aspect of the study. However, the explanation of the characteristics to be measured in this test was not known. These test scores were reported to predict ratings of creative ability made by college instructors, but not to predict the academic grades students receive from these instructors nor to correlate appreciably with ability test scores. That is, results

obtained from this test do appear to measure something not reflected in the usual indicators of academic success.

The three objective tests were administered to the 20 students in the course CTM 202. A total score was obtained for each of the three tests. In addition a student score for each of the six characteristics was obtained on the experimental test.

The data were analyzed for agreement of the students' scores on each of the objective test with the subjective criterion. The finding revealed that the Creative Behavior Inventory which was based on all six characteristics of the working definition of creative ability agreed with the subjective criterion on 14 of the 20 total cases. The Maitland Graves Art Judgement Test based on only one of the six characteristics agreed with the subjective criterion on 10 of the 20 cases and the Creative Personality Scale agreed with the subjective criterion data on 7 of 20 cases.

A compilation of correlation of each objective test with the subjective criterion revealed the following validity coefficients: (1) Creative Behavior Inventory +.72, (2) Maitland Graves Art Judgment Test +.07 and (3) Creative Personality Scale +.08.

Therefore, the hypothesis that the creative ability of students may be identified from their scores on a valid evaluation instrument was accepted on the basis of the fairly high correlation of the Creative Behavior Inventory with the subjective criterion.

Implications of the Study

The implications resulting from the study will probably be of as much value as the actual findings. The study was exploratory in nature and concerned with a most complex subject -- creativity. Therefore, due

to the nature of the study several implications were evident that further research is needed in this area.

The educators participating in the study held a high degree of agreement about some characteristics as being indicative of the creative ability of a student. However, the extensive disagreement among this group concerning other characteristics may indicate that those agreed upon are only a portion of the total picture of creativity. Thus, one of the most immediate problems in the study of creativity appears to be that of developing suitable criteria for identifying creative ability and behavior of the student in the area of textiles and clothing. This would indicate that more study is needed concerning the physiological, intellectual, personality and situational factors related to the creativity of the student. The task of identifying the factors which are pertinent to creativity and explaining how they are related to the creative process, as well as how they are interrelated with one another is an extremely complex problem which affords much opportunity for research. Understandings gained from such studies will no doubt someday cast illumination upon the total picture of creative behavior.

Perhaps the study reported here will stimulate further research which may lead to the information needed to formulate a complete taxonomy of creative behavior of the student in the area of textiles and clothing. The need for such a taxonomy was sensed by the present researcher. The term "creativity" was found to be defined in myriad ways and the behaviors associated with creative ability to vary widely among scholars of the subject.

A taxonomy of creative behavior could prove most helpful to educators in planning for the enrichment of curriculum for the development and nurture of creative ability as well as leading to the development

of improved methods for the assessment of the creative ability of the student. There is a great necessity in a democratic society for an adequate solution to these as well as other pertinent problems concerning the identification and development of creative potential of the student. Practices indicated by these studies need to be integrated into the educational system if educators of today are to provide opportunity for the development of each student to the fullest of "that which in him lies."[1]

---

[1]Kilpatrick, p. 39.

SELECTED BIBLIOGRAPHY

Adrain, E. D., and H. H. Jasper, ed. Brain Mechanisms and Consciousness. Oxford: Brockwell, 1954.

Ahmann, J. Stanley, and Marvin D. Glock. Evaluating Pupil Growth. Boston: Allyn and Bacon, Inc., 1963.

Allen, Myron S. Morphological Creativity. Englewood Cliffs: Prentice-Hall, Inc., 1962.

Anderson, Harold M. ed. Creativity and Its Cultivation. New York: Harper and Brothers Publishers, 1959.

Andrews, M. F. ed. Creativity and Psychological Health. Syracuse: Syracuse University Press, 1961.

Barron, Frank. Creativity and Psychological Health. New York: D. Van Nostrand Company, Inc., 1963.

Barron, Frank. "Creative Vision and Expression." New Insight and the Curriculum. Ed. Alexander Frazier. Washington: National Education Association, 1963.

Barron, Frank. "The Psychology of Creativity." New Directions in Psychology. Ed. Frank Barron, et. al. New York: Holt, Winston, & Rinehart, 1965.

Bartlett, Frederick C. Thinking. New York: Basic Books, Inc., 1959.

Burden, Virginia. The Process of Intuition. New York: Greenwich Book Publishers, 1957.

Buros, Oscar K. Test in Print. Highland Park: Gryphon Press, 1961.

Conant, James B. "The Highly Creative 3 Per Cent of the Population." Creativity of Gifted and Talented Children. New York: Columbia University, 1959.

Constitution and By-Laws of the American Home Economics Association. Journal of Home Economics, LV (September, 1963), p. 571.

Cozine, June. Evaluation - Meaning of Terms. Mimeographed copy. Stillwater: Oklahoma State University, (June 1, 1959), p. 2.

Crawford, Robert P. The Techniques of Creative Thinking. New York: Hawthorn Books, Inc., 1954.

Curran, Clyde E. "History and the Creative Individual." Journal of Humanistic Psychology, I (Fall, 1961), pp. 51-72.

Dale, Edgar, ed. "Education for Creativity." The News Letter, XXX Columbus: 1964.

DeHaan, R. R., and Robert J. Havighurst. Educating Gifted Children. Chicago: University of Chicago Press, 1957.

DeMille, Richard. "The Creativity Boom." The Education Digest, XXIX (February, 1964), pp. 12-15.

Deutsch & Shea, Inc. Company Climate and Creativity. New York: Industrial Relations News, 1959.

Falcone, Patricia L. "An Exploratory Study Designed to Ascertain Development of Creative Ability in Selected High School Home Economics Students." Journal of Home Economics, LV (March, 1963), p. 212.

Fliegler, Louis A. Curriculum Planning for the Gifted. Englewood Cliffs: Prentice-Hall, Inc., 1961.

Freud, Sigmund. Civilization and Its Discontents. New York: W. W. Norton, 1962.

Fricke, Benno G. Opinion, Attitude and Survey Handbook. Ann Arbor: University of Michigan, 1963.

Fromm, Erich. The Sane Society. New York: Rinehart, 1955.

Garrett, Henry E. Statistics in Psychology and Education. New York: David McKay Co., Inc., 1958.

Gerard, R. E. "The Biological Basis of Imagination." The Creative Process. Ed. B. Ghislin. Berkeley: University of California Press, 1952.

Getzel, Jacob W., and Philip W. Jackson. Creativity and Intelligence. New York: John Wiley and Sons, Inc., 1962.

Ghiselin, Brester. The Creative Process. Berkeley and Los Angeles: University of California Press, 1952.

Givens, R. P. "Identifying and Encouraging Creative Processes." Journal of Higher Education, XXX (June, 1962), pp. 295-301.

Goldberg, Dorothy. The Creative Women. Washington: Robert B. Luce, Inc., 1963.

Good, Carter V. Dictionary of Education. New York: McGraw-Hill Book Company, Inc., 1950.

Gruber, H. E., Glenn Terrill, and Wertheimer, ed. Contemporary Approaches to Creative Thinking. New York: Atherton Press, 1962.

Gruen, Walter. "The Utilization of Creative Potential in Our Society." Journal of Counseling Psychology, IX (Spring, 1962), pp. 79-83.

Guilford, J. P. "The Relation of Intellectual Factors to Creative Thinking in Science." Conference on Identification of Creative Scientific Talent. Ed. Calvin W. Taylor. Salt Lake City: University of Utah Press, 1956. p. 71.

_____. "Creativity." American Psychologist, V (September, 1950), pp. 444-454.

_____. "Intellectural Resources and Their Values as Seen by Scientists." The Third University of Utah Research Conference on the Identification of Creative Scientific Talent. Ed. Calvin W. Taylor, Salt Lake City: University of Utah Press, 1959.

_____. "Factors that Aid and Hinder Creativity." Teachers College Record, LXIII (February, 1962), pp. 388-392.

Hallman, Ralph J. "Can Creativity Be Taught?" Educational Theory, (January, 1964), pp. 15-23.

Harris, Richard H. "The Development and Validation of a Test of Creative Ability." (Unpublished Doctoral Dissertation, Purdue University, 1955).

Henry, Nelson B., ed. Education for the Gifted. National Society for the Study of Education, Fifty-Seventh Yearbook, Part II, Chicago: 1958.

Hitt, W. D. "Toward a Factor Theory of Creativity." Psychology Record, XV (January, 1965), pp. 127-132.

_____, and J. R. Stock. "The Relations Between Psychological Characteristics and Creative Behavior." Psychological Record, XV (January, 1965), pp. 133-140.

Hoffman, B. "The Tyranny of the Multiple-Choice Test." New York: Harper and Brothers, 1961.

Kant, Immanuel. Critique of Judgment. Trans. by J. H. Bernard, London: MacMillan and Co., 1931.

Kety, Seymour S. "A Biologist Examines the Mind and Behavior." Science, CXXXII (December 23, 1960), pp. 1861-1870.

Kilpatrick, William H. "A Philosophic Viewpoint and a Suggested Program," Programs for the Gifted. The Fifteenth Yearbook of the John Dewey Society, New York: 1961.

Krathwohl, David R., Benjamin S. Bloom, and Bertram B. Masia. Taxonomy of Educational Objectives. New York: Davis McKay Company, Inc.,

LaBrant, Lou. "The Dynamics of Education." Saturday Review, XLII (September 12, 1959), p. 28.

Livingston, Robert T., and Stanley H. Milberg. Human Relations in Industrial Research Management. New York: Columbia University Press, 1957.

Lombroso, Cesare. The Man of Genius. London: Walter Scott, 1891.

MacKinnon, Donald W. "Characteristics of the Creative Person: Implications for the Teaching-Learning Process." Association for Higher Learning, Washington, 1961, pp. 89-93.

_____. "What Do We Mean By Talent and How Do We Test for It?" The Search for Talent. New York: College Entrance Board, 1960.

_____. "What Makes a Person Creative?" Saturday Review, XLV (February 10, 1962), p. 15.

Maitland Graves Design Judgment Test Manual. New York: The Psychological Corporation, 1948.

Maritain, Jacques. Creative Intuition in Art and Poetry. New York: Pantheon Books, 1953.

Maslow, Abraham E. "Some Basic Propositions of a Growth and Self-Actualization Psychology." Perceiving, Behaving, Becoming: A New Focus for Education. Washington: Association for Supervision and Curriculum Development, 1962.

McDonald, Alice O. "Indicators for Creative Thinking." Journal of Home Economics, LIII (October, 1961), pp. 667-669.

McKenney, J. Wilson, ed. "Creativity in the Schools." Journal-California Teachers Association, LX (January, 1964).

McNeil, E. B. "The Paradox of Education for the Gifted." Improving College and University Teaching, (August, 1963), pp. 111-115.

Miles, Catherine C. "Crucial Factors in the Life History of Talent." Talent and Education. Ed. E. Paul Torrance. Minneapolis: University of Minnesota Press, 1960.

Monroe, Betty I. "Creative Problems in Costume Illustration." (Master's Thesis, Iowa State College, 1950).

Nahm, Milton C. The Artist as Creator. Baltimore: John Hopkins Press, 1956.

Neff, Walter S. "A Q-Sort Instrument to Assess the Meaning of Work." Journal of Counseling Psychology, (October, 1963), pp. 39-45.

Olds, James. "Self-Stimulation of the Brain." Science, CXXVII (February, 1958), pp. 315-324.

Ornstein, Jacob. "New Recruits for Science." Parents Magazine, XXXVI (February, 1961), p. 42.

Osborn, Alex F. Applied Imagination. New York: Charles Scribner's Sons, 1963.

Peet, Harriett E. The Creative Individual. New York: The Ronald Press Co., 1960.

Rasey, M. I. "Creativity and Its Psychological Implications." Educational Leadership, XIII (February, 1956), pp. 283-288.

Rowan, Helen. "The Creative People: How to Spot Them." Think, XXVIII (November-December, 1962), pp. 7-15.

Sanford, Nevitt, ed. The American College. New York: John Wiley & Sons, Inc., 1962.

Schary, Dore. "The Creative Spirit and the Free Society." Current Issues in Higher Education, Chicago: 1960, pp. 24-31.

Scofield, Psychology 443, Class Lecture, Stillwater: Oklahoma State University, April 11, 1964.

Scott, Dorothy, et. al. Home Economics, New Directions, A Statement of Philosophy and Objective. Washington: 1959.

Seigel, Lawrence, and John O. Crite. "Test Reviews." Journal of Counseling Psychology, (September, 1962), p. 92.

Shertzer, Bruce, ed. Working with Superior Students. Chicago: Science Research Associates, 1960.

Simpson, Ray M. "Creative Imagination." American Journal of Psychology, XXXIII (April, 1922), pp. 234-243.

Smillie, D. Test and Definition of Intelligence. Detroit: Merrill-Palmer School, 1959.

Smith, Keery G., ed. "Characteristics of the Creative Person." Current Issues in Higher Education, Washington, D.C.: 1961.

Sorokin, Pitirim A. "General Theory of Creativity." Creativity and Psychological Health. Ed. M. F. Andrews. Syracuse: Syracuse University Press, 1961.

Starkweather, Elizabeth K. "Developing Methods for Judging Potential Creative Abilities of Preschool Children." Research Reports, II (November, 1963) Stillwater: Oklahoma State University, pp. 1-3.

Stein, Morris I., and Shirley J. Heinze. Creativity and the Individual. Glencoe: The Free Press of Glencoe, 1960.

Stephenson, William. The Study of Behavior - Q-Technique and Its Methodology. Chicago: University of Chicago Press, 1955.

Street, Paul W., ed. Creativity and College Training. Lexington: University of Kentucky, 1962.

Taylor, Calvin W. Creativity: Progress and Potential. New York: McGraw-Hill Book Company, 1964.

_____. "Identifying the Creative Individual." Creativity. Ed. E. Paul Torrance. Minneapolis: University of Minnesota, 1959.

_____, and John L. Holland. "Development and Application of Test of Creativity," Review of Educational Research. (February, 1962), pp. 91-102.

Taylor, I. A. "The Nature of the Creative Process." Creativity. Ed. P. Smith. New York: Hastings House Publishers, Inc., 1959.

Torrance, E. Paul. "Developing Women's Natural Gifts." Women's Education, IV (March, 1965), p. 1.

_____. Guiding Creative Talent. Englewood Cliffs: Prentice-Hall, Inc., 1962.

_____, ed. Talent and Education. Minneapolis: University of Minnesota Press, 1960.

Toynbee, Arnold. "Is America Neglecting Her Creative Minority?" Mills Quarterly, XLIV (May, 1962), pp. 5-6.

Tyler, Ralph W. "Evaluation in Teaching for Creativity." Creativity and College Teaching. Ed. W. Paul Street. Lexington: University of Kentucky, 1963.

Von Frange, Eugene K. Professional Creativity. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1959.

Walker, Howard E. "Relationship Between Predicted School Behavior and Measure of Creative Potential." (Unpublished Doctoral Dissertation, University of Michigan, 1963).

Whiting, Charles S. Creative Thinking. New York: Reinhold Publishing Corporation, 1958.

Witty, Paul. "The Nature and Needs of the Gifted and Superior Adolescents," Programs for the Gifted. Ed. Nelson B. Henry. Fifteenth Yearbook of the John Dewey Society, New York, 1961.

Yamamoto, Kaou. "Creative Thinking: Some Thoughts on Research." Exceptional Children, XXX (May, 1964), pp. 403-410.

Zilboog, G. "The Psychology of the Creative Personality." Creativity. Ed. P. Smith. New York: Hastings House Publishers, 1959, p. 30.

Zirbes, Laura. "The Contribution of Creative Education to Human Development and Fulfillment." Aesthetic Form and Education. Syracuse: Syracuse University Press, 1958.

_____. Spurs to Creative Teaching. New York: G. P. Putnam's Cons, 1959.

APPENDIX A

OPINIONNAIRE OF CHARACTERISTICS OF CREATIVE ABILITY

Home Economics Education Department
Oklahoma State University
Stillwater, Oklahoma 74075
March 2, 1965

Dear

A dissertation is not the fruits of one person's toils but it involves the labors of many. Therefore, I am soliciting the assistance of college teachers in the area of textile and clothing in attendance at the "Conference of College Teachers of Textiles and Clothing of the Central Region" held in Chicago, October 28-31, 1964.

The research study which I am conducting under the direction of Dr. June Cozine, Oklahoma State University, is for the purpose of identifying and evaluating creative abilities of students in the area of textiles and clothing.

Creativity is used in this study to mean that when a student gets insight into a relationship between objects or facts which she has not known before and she does this all by herself, she has been creative. For example, if a student in clothing construction class has the problem of setting a sleeve into the armscye of an unfinished garment and she has never done this before, she has not seen anyone do this, she has not read how to do this, no one has told her how to do this but she successfully solves the problem by herself, she has been creative.

Since creative ability is not a readily observable trait, an attempt is being made to identify behaviors, personality traits or observable manifestations which are indicative of the student with high creative abilities in the area of textiles and clothing. It is hoped that the results of this Opinionnaire will provide information needed for the construction of an evaluation device to identify students with high creative abilities and to select learning experiences which will contribute to the development of the student's creative abilities in the area of textiles and clothing.

I would greatly appreciate your participation as I would like to obtain a good representation of the opinions of college teachers attending the Central Regional Conference. The only request which will be made of you is to: (1) Complete the enclosed Opinionnaire by responding to all questions; and (2) Return the Opinionnaire in the enclosed self-addressed envelope. I would appreciate receiving your response not later than April 1, 1965.

Thank you very much, I shall be looking forward to hearing from you.

Sincerely yours,

Mary E. Boaz

Mary E. Boaz

enclosures

OPINIONNAIRE OF CHARACTERISTICS INDICATIVE OF CREATIVE ABILITIES

A

Creative abilities of a student in the area of textiles and clothing may be indicated by her display of a high degree of certain characteristics. On the rating scale provided below please circle the number which best represents your opinion of each characteristic listed as an indicator of creative abilities of a student in the area of textiles and clothing.

Circle (1) 2 3 4 5 if you completely agree that the characteristic is an indicator.
Circle 1 (2) 3 4 5 if you tend to agree that the characteristic is an indicator.
Circle 1 2 (3) 4 5 if you are uncertain as to whether the characteristic is an indicator.
Circle 1 2 3 (4) 5 if you tend to disagree that the characteristic is an indicator.
Circle 1 2 3 4 (5) if you completely disagree that the characteristic is an indicator.

Rating Scale	Characteristic	Explanation of Characteristic
1 2 3 4 5	1. Aesthetic	Shows sensitivity to art and beauty, exhibits good taste and judgment of art.
1 2 3 4 5	2. Clever	Displays a flair for skillful manipulation of ideas and objects, manifest great practical intelligence especially in contriving.
1 2 3 4 5	3. Conflict	Finds difficulty in making choices, may have two or more desires of equal strength.
1 2 3 4 5	4. Experimentive	Prefers to explore, tries many ways to reach goal, willingness to take risk.
1 2 3 4 5	5. Flexibility	Adjusts readily to change, expresses self through a variety of media, may use one object for many things, likes to improvise.
1 2 3 4 5	6. Fluency of Ideas	Exhibits a facile flow of ideas, seeks new ideas.
1 2 3 4 5	7. Imaginative	Forms pictures in the mind not visible through the senses, combines old ideas and objects into new forms.
1 2 3 4 5	8. Independent	Exercises self confidence, self direction; initiation, determination and reliability.
1 2 3 4 5	9. Insight	Demonstrates understanding of problems with little or no previous experience with exact situations, solutions to problems appear suddenly, shows keen understanding into the nature of a problem.
1 2 3 4 5	10. Intelligent	Intelligent quotient as demonstrated by results from standardized intelligence test.
1 2 3 4 5	11. Intuitive	Knows or perceives by intuition, intuitive in thought processes, not bound to what is but alert and seeking what could be.
1 2 3 4 5	12. Orderly	Exhibits neatness, tidiness and good arrangement.
1 2 3 4 5	13. Original	Creates new ideas or objects, inventive, unique, ingenious.
1 2 3 4 5	14. Patient	Shows perseverence, calmness, apparently undisturbed by obstacles, delays and failures.
1 2 3 4 5	15. Perceptive	Possesses sensual awareness and intuitive cognition, shows interest in many things, curious.
1 2 3 4 5	16. Positive Ego Strength	Possesses great faith in own ability, pursues goals with little or no support from others or often in spite of opposition.
1 2 3 4 5	17. Preference for Complexity	Chooses abstract designs, tendency to use many colors, can manipulate a number of ideas at one time.
1 2 3 4 5	18. Rebellious	Shows defiance to authority or control, open resistance to convention.
1 2 3 4 5	19. Sensitivity to Problems	Awareness of the existence of problems, foresees consequences and infers causes in solving problems.
1 2 3 4 5	20. Uninhibited	Exhibits freedom from conventional restraints and inhibitions, displays freedom of expression, emotion, action and thought.

B

Please list, give explanation and rate any characteristics not appearing in A that you feel are indicators of creative abilities of the student in the area of textiles and clothing. Use the same system for rating the characteristics as used for items 1-20 under A.

	List Characteristic	Explanation of Characteristic	Rating Scale
1.	_____	_____	1 2 3 4 5
2.	_____	_____	1 2 3 4 5
3.	_____	_____	1 2 3 4 5
4.	_____	_____	1 2 3 4 5
5.	_____	_____	1 2 3 4 5

C

Using your own judgment please list the:

1. One characteristic that you believe is most indicative of creative abilities of a student in the area of textiles and clothing.

   a._____

2. Two characteristics as a pair that you believe are most indicative of creative abilities of a student in textiles and clothing.

   a._____

   b._____

3. Five characteristics as a group that are most indicative of creative abilities of a student in the area of textiles and clothing.

   a._____

   b._____

   c._____

   d._____

   e._____

D

Is the development of the creative abilities of students an objective of the clothing program in your department? Please check Yes_____ or No_____.

APPENDIX B

ADDED CREATIVE CHARACTERISTICS SUGGESTED BY RESPONDENTS

TABLE X

ADDED CREATIVE CHARACTERISTICS SUGGESTED BY RESPONDENTS

	Characteristic	Explanation	Rating
1.	Ability	Natural talent as well as formal learning	
2.	Acute Observation	Detects trends readily	1
3.	Ambitious		2-3
4.	Analytical	Knows the Whys and the Hows	1
5.	Appreciation	Love and understanding of fabric, color, lines, clothes	1
6.	Appreciation	Responsive to the beautiful	2
7.	Appropriateness or Functionality	Functions either to add beauty or some stated purpose	2
8.	Artistic	Showing taste or skill in the Arts	1
9.	Broad Interest		2
10.	Clarity of expression	Able to express self so others understand	1
11.	Concerned	Interested	1
12.	Confidence	Or is this your positive-ego?	3
13.	Control	Able to carry out an idea through to purposeful completion	1
14.	Courage	Muster strength in face of defeat	2
15.	Craftsmanship	What he does must be functional, work smoothly, be beaufitul as well as original and expressive. Would be good in reasearch.	1
16.	Discrimination	To distinguish, observation, a mark of distinction.	2
17.	Enthusiastic	Will show apparent pleasure and great enthusiasm while producing, has fun in doing, lets herself go, gets lost in project.	

TABLE X (Continued)

18.	Extremely sensitivity		1
19.	Individuality		1
20.	Initiative	Tends to start things on her own - can be same as independent	1
21.	Interest	Highly motivated	1
22.	Interest	Desire or urge to do something	
23.	Inspiration	Animating action or influence	1
24.	Inventive	Devising some new process	1
25.	Knowledge	Basic understanding may be natural as well as acquired	
26.	Logical order of ideas	Presents ideas as they would come	1
27.	Love	Obvious love of work, beauty, unusual	2
28.	Manipulative Skill	Must know what can be done with fabric, and essentials of construction	1
29.	Objectivity	Important in making decisions	2
30.	Orderly	Environment and external things around them organized and neat	4
31.	Physical vitality	Constant drive, dynamic	1
32.	Production	Continued activity - past, present and future	1
33.	Productive	Can get the job done - usually creating something attractive to others	2
34.	Prolific	Characterized by involving or causing abundant production	2
35.	Realistic	Recognition of conditions and attempt to modify them	1
36.	Reflective	Willing to mull over ideas, not expecting immediate results. Sees relationships in varied sources of inspiration.	1

TABLE X (Continued)

37.	Resourceful	Recognizes problems and seeks satisfying solutions	1
38.	Resourceful	Demonstrates skill use or awareness of broad base of resource. Understands need for experience, resources may be human, environmental, physical, etc.	2
39.	Sensitivity	Capacity for response to stimulation capacity of receiving impressions	2
40.	Self-expression	Ability to self analyze	1
41.	Skill	Knowledge of construction of fabric and clothes	1
42.	Spontaneity	Freedom of expression	2
43.	Tenacity	Keep trying - resist failure	2
44.		Applies learning experiences to new situations	1
45.		Interested in new ideas	1
46.		Interested in reasons back of new ideas	1
47.		Person is bored with routine - would make a poor researcher	1
48.		Problem solving activity	1

APPENDIX C

CREATIVE PRODUCT RATING SCALE

CREATIVE PRODUCT RATING SCALE

This rating scale is designed for teachers to record their judgments of the creative ability of students exhibited in a display of five products of each student. Six characteristics have been agreed upon by a selected group of college teachers as being indicative of the student with high creative abilities in the area of textiles and clothing. These characteristics with an explanation of each are listed below for the purpose of providing criteria for the teacher to judge the creative abilities exhibited in the students' products. An identification number has been assigned to each group of students' products for use by the teacher in indicating ratings.

General Instructions

A. Read the list of characteristics and the explanation of each carefully.

B. Give a general rating to each group of students' products on display.

C. Rate each student's products for the exhibition of each characteristic.

D. List and rate any additional characteristics exhibited in the students' products that are indicative of creative abilities of students in the area of textiles and clothing.

A. Characteristics of Creative Students in the Area of Textiles and Clothing

Please read the list of characteristics and the explanation of each carefully. These are the criteria on which you are asked to judge the students' products on display.

Characteristic	Explanation of Characteristic
Aesthetic	Shows sensitivity to art and beauty, exhibits good taste and judgment of art.
Experimentive	Prefers to explore, tries many ways to reach goal, willingness to take risk.
Flexibility	Adjusts readily to change, expresses self through a variety of media, may use one object for many things, likes to improvise.
Fluency of Ideas	Exhibits a facile flow of ideas, seeks new ideas.

Imaginative	Forms pictures in the mind not visible through the senses, combines old ideas and objects into new forms.
Original	Creates new ideas or objects, inventive, unique, ingenious.

B. General Ratings of Students' Products

Please give each group of students' products on display one of three general ratings according to whether you judge the product to exhibit high creative abilities of the student, medium creative abilities of the student or low creative abilities of the student. Indicate rating of each student's products by recording the identification number in one of the columns provided below.

Under column 1 if the product exhibits high creative abilities of the student.
Under column 2 if the product exhibits medium creative abilities of the student.
Under column 3 if the products exhibits low creative abilities of the student.

Column 1	Column 2	Column 3

C. RATINGS OF EACH CHARACTERISTIC

Using your own judgment please rate each student for each characteristic.

Circle (1) 2 3 if the students' products exhibit a high degree of the characteristic.
Circle 1 (2) 3 if the students' products exhibit a medium degree of the characteristic.
Circle 1 2 (3) if the students' products exhibit a low degree of the characteristic.

Identification Number	Aesthetic	Experimentive	Flexibility	Fluency of Ideas	Imaginative	Original
1	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
2	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
4	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
5	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
6	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
7	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
8	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
9	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
10	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
11	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
12	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
13	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
14	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
15	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
16	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
17	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
18	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
19	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
20	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
21	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
22	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
23	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
24	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
25	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3

D. Additional Characteristics

Please list and rate any characteristic not appearing under C which you judge to be exhibited in the students' products that are indicative of the students' creative ability in the area of textiles and clothing. Use the same rating system as the item 1-25 under C.

Identification Number	Characteristic	Explanation of Characteristic	Rating
_____	_____	_____	1 2 3
_____	_____	_____	1 2 3
_____	_____	_____	1 2 3
_____	_____	_____	1 2 3
_____	_____	_____	1 2 3

APPENDIX D

CREATIVE BEHAVIOR INVENTORY

CREATIVE BEHAVIOR INVENTORY

Name _____

POCKET #1
This pocket should contain 54 cards.

POCKET #2
STATEMENTS MOST DESCRIPTIVE OF ME

POCKET #3
STATEMENTS SOMEWHAT DESCRIPTIVE OF ME

POCKET #4
STATEMENTS LEAST DESCRIPTIVE OF ME

The Creative Behavior Inventory has been designed to sample creative behavior. The statements on the cards you have been given are not to be considered "right" or "wrong." Each statement reflects a behavior which may or may not be descriptive of you.

Directions:

1. Find the packet of 54 cards in Pocket #1 on opposite side of this page.
2. Read the statements on each card carefully, dividing the packet of cards into three equal groups:
   (a) Those most descriptive of you
   (b) Those somewhat descriptive of you
   (c) Those least descriptive of you
3. Please, place 18 cards in each group.
4. Fit each group of cards into the corresponding pocket provided on the opposite side of this page.
5. Be sure your name is in the space provided.

*The evaluation instrument was constructed to afford pockets for housing the cards to be sorted by the student, (Pocket #1) and for convenience of keeping the responses in order for scoring, (Pocket #2, 3, and 4).

TABLE XI

TOTAL ITEM* ON THE EXPERIMENTAL TEST ACCORDING TO CHARACTERISTICS, SUBJECT AND LEVEL OF CREATIVITY

Characteristics	Subject	Item on Test	Level of Creativity
Aesthetic	Textiles	1. I would not purchase a textile product for any purpose unless it had artistic qualities.	H
		2. I would like for a textile product which I purchased to have artistic qualities but consider the function to be more important.	M
		3. I would be more concerned about the function of a textile product than the artistic qualities.	L
Experimentive	Textiles	4. I prefer learning about textile properties by performing experiments in a laboratory.	H
		5. I like to learn about the properties of textiles by doing laboratory experiments only if I can follow a laboratory manual.	M
		6. I prefer to gain a knowledge of the properties of textiles from lectures or readings.	L
Flexibility	Textiles	7. I can think of many suitable uses for most textile products.	H
		8. I can think of more than one suitable use for most textile products.	M
		9. I can think of at least one suitable use for most textile products.	L
Fluency of Ideas	Textiles	10. If asked to design a garment using one particular fabric, I could produce many suitable designs.	H
		11. If asked to design a garment using one particular fabric, I could produce a few suitable designs.	M
		12. If asked to design a garment using one particular fabric, I could produce at least one suitable design.	L
Imaginative	Textiles	13. I often visualize a new fabric with special properties to meet some need or give a specific effect to a garment design.	H
		14. I sometimes visualize a new fabric with special properties to meet some need or give a specific effect to a garment design.	M
		15. I seldom if ever have a need for a fabric with different properties from those on the current market.	L
Original	Textiles	16. I usually like to combine textiles products that differ from those combined by my classmates.	H
		17. I sometimes like to combine textiles products that differ from those combined by my classmates.	M
		18. I prefer to combine textiles products which are similar to those combined by my classmates.	L
Aesthetic	Merchandising	19. If I were a buyer for a sportswear department I would purchase only popular sales items which exhibit beauty and good taste.	H
		20. If I were a buyer for a sportswear department I would be influenced by beauty and good taste in my purchasing but not at the expense of losing sales.	M
		21. If I were a buyer for a sportswear department I would make purchases on the basis of "what-will-sell" with little concern for beauty and good taste.	L
Experimentive	Merchandising	22. I experiment with many ideas when arranging a bulletin board.	H
		23. I usually have a few ideas I like to try when arranging a bulletin board.	M
		24. I prefer to plan a bulletin board and arrange it without trying a lot of different ideas.	L
Flexibility	Merchandising	25. I think that a department store advertises for many reasons.	H
		26. I think that a department store advertises for a limited number of reasons.	M
		27. I think that a department store advertises for only one reason.	L
Fluency of Ideas	Merchandising	28. I can think of a dozen good themes for a style show.	H.
		29. I can think of four or five good themes for a style show.	M
		30. I can think of only one or two good themes for a style show.	L

*Each item was printed on a separate card which was fitted into the pocket provided on evaluation instrument.

TABLE XI - (Continued)

Imaginative	Merchandising	31. When shopping in a department store I often think of ways I would improve the store if I were manager of that store.	H
		32. When shopping in a department store I sometimes think of ways I would improve the store if I were manager.	M
		33. When shopping in a department sore I seldom if ever think of any changes I would like to make in the store.	L
Original	Merchandising	34. If I were working in the sales department of a store I would "dream-up" new sales promotion themes and ideas.	H
		35. If I were working in a sales promotion department of a retail store I would combine some new ideas with the national sales promotions of manufacturers.	M
		36. If I were working in the sales department of a store I would capitalize on national sales promotion of the manufacturer.	L
Aesthetic	Clothing	37. When I am shopping for a new garment, I find many which have poor proportion, line and/or color harmony.	H
		38. When I am shopping for a new garment I occasionally find one which has poor proportion, line and/or color harmony.	M
		39. When I am shopping for a new garment I seldom if ever find garments which have poor proportion, line and/or color harmony.	L
Experimentive	Clothing	40. I usually enjoy spending time in a dress shop looking at new styles of garments and trying to figure out how certain effects were obtained.	H
		41. Occasionally I enjoyed visiting a dress shop to look at new styles of garments and trying to figure out how certain effects were obtained.	M
		42. I am bored by browsing in a dress shop.	L
Flexibility	Clothing	43. I prefer accessories in my wardrobe which can be coordinated in many different ways.	H
		44. I prefer a number of accessories which are somewhat limited in their use.	M
		45. I prefer to have a completed coordinated set of accessories for each of my garments.	L
Fluency of Ideas	Clothing	46. When I have a problem of designing a garment I usually look through magazines, store windows and many other places for ideas.	H
		47. When I have the problem of designing a garment I may search through a few magazines for ideas.	M
		48. When I have the problem of designing a garment I tend to fasion it after something I have recently seen.	L
Imaginative	Clothing	49. I often visualize an improved technique for solving a clothing construction problem.	H
		50. Occasionally I visualize an improved technique for solving a clothing construction problem.	M
		51. I prefer to follow accepted methods of clothing construction.	L
Original	Clothing	52. When I am preparing a fashion plate I prefer to sketch without any props.	H
		53. When I am preparing a fashion plate I prefer to sketch from a live model.	M
		54. When I am preparing a fashion plate I prefer to sketch from a "swipes."	L

SCORING THE CREATIVE BEHAVIOR INVENTORY

Items placed in pocket #2 and #4 were considered when scoring the Creative Behavior Inventory. Statements representing a high degree of creativity placed in pocket #2 were assigned a rating of 3 points each; statements representing a medium degree of creativity, placed in pocket #2 were assigned a rating of 1 point each, and statements representing a low degree of creativity were assigned a rating of 0 point each. Likewise, statements representing a low degree of creativity appearing in pocket #4 were assigned a rating of 3, statements representing a medium degree of creativity were assigned a rating of 1 and statements representing a high degree of creativity were assigned a rating of 0. The ratings for each item appears on page 107.

KEY FOR SCORING ITEMS APPEARING IN POCKET #2

Items Number	Points
1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 46, 49, 52	3
2, 5, 11, 14, 17, 20, 23, 26, 29, 32, 35, 38, 41, 44, 47, 50, 53	1
3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54	0

KEY FOR SCORING ITEMS APPEARING IN POCKET #4

Items Number	Points
3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54	3
2, 5, 11, 14, 17, 20, 23, 26, 29, 32, 35, 38, 41, 44, 47, 50, 53	1
1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 46, 49, 52	0

Student's score was found by totaling the points earned by items in both pocket #2 and #4. The highest score possible was 108 points.

APPENDIX E

RATINGS OF CREATIVE ABILITY OF STUDENTS BASED ON OBJECTIVE TESTS SCORES

TABLE XII

RATINGS OF CREATIVE ABILITY OF STUDENTS BASED ON OBJECTIVE TEST SCORES

Rating of Student	Creative Behavior Inventory*		Maitland Graves Art Judgment*		Creative Personality Inventory**	
	Student	Score	Student	Score	Student	Score
H	I	80	P	96	N	90
H	R	75	F	91	O	84
H	Q	75	Q	86	L	80
H	J	75	N	85	H	80
H	P	70	T	85	F	75
H	H	70	E	85	E	75
H					P	75
H					K	70
M	A	67	L	76	I	58
M	F	66	I	73	G	51
M	C	66	R	73	J	45
M	M	65	M	71	M	45
M	L	60	C	70	Q	45
M	E	68	A	70		
M	G	57	G	70		
M	N	57				
L	K	55	D	67	S	40
L	D	50	O	67	R	40
L	O	51	H	67	A	35
L	B	42	J	66	C	30
L	S	42	S	58	B	25
L	T	40	B	50	D	25
L			K	49	T	21

* Percentage score
** Percentile score

VITA

Mary Evelyn Boaz

Candidate for the Degree of

Doctor of Education

Thesis: IDENTIFICATION AND EVALUATION OF CREATIVE ABILITIES OF STUDENTS IN THE AREA OF TEXTILES AND CLOTHING

Major Field: Home Economics Education

Biographical:

Personal Data: Born in Fayetteville, Arkansas, October 25, 1927, the daughter of Glen E. and Nellie B. Boaz.

Education: Graduated from the University of Arkansas with a Bachelor of Science degree in Home Economics in 1949; received the Master of Science degree from the University of Arkansas with a major in Home Economics in June, 1958; completed requirements for the Doctor of Education degree in August, 1965.

Professional experience: Home Demonstration Agent, Carroll County, Arkansas, 1949-1951; Director of Home Service Department, Arkansas Western Gas Company, Fayetteville, Arkansas, 1951-1956; Graduate Assistant in Home Economics, University of Arkansas, 1957-1958; Instructor of Home Economics, Illinois State University, Normal, Illinois, 1959-1961; Assistant Professor of Home Economics, Illinois State University, 1961-1963; Graduate Assistant in Clothing, Textiles and Merchandising, Oklahoma State University, Stillwater, Oklahoma, 1963-1964; Instructor of Clothing, Textiles and Merchandising, Oklahoma State University, Summer 1965.

Professional organizations: American Home Economics Association, Arkansas Home Economics Association, Illinois Home Economics Association, National Education Association, Illinois Education Association, American Association of University Professors, American Association of University Women; Business and Professional Women's Club; American Gas Association; Southern Gas Association, Home Economics in Business; Home Economics Club; Phi Upsilon Omicron and Omicron Nu.