TEACHER JUDGMENTS AS RELATED TO CERTAIN PREDICTORS
OF ARTISTIC CREATIVITY IN SENIOR
HIGH-SCHOOL STUDENTS

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TEACHER JUDGMENTS AS RELATED TO CERTAIN PREDICTORS
OF ARTISTIC CREATIVITY IN SENIOR
HIGH-SCHOOL STUDENTS

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CHAPTER I

INTRODUCTION

During the past decade there has been a surge of effort to measure creativity, perhaps because of the realization that an intelligence test does not measure novelty, ingenuity, originality, or spontaneity in thinking. The realization that creativity is manifested in different ways coincided with the recognition that creativity needs its own distinctive measures. The creativity of the musician in assembling notes and harmonics into new and different musical compositions is not the same creativity as that of the atomic scientist. The novel approach of the mechanical engineer in developing a useful but untried machine is not the originality of the dress designer who annually produces many varied styles in clothing. Yet it seems evident that each of these originators has qualities which are common to all in that each is able to take materials and concepts widely available and to arrive at products which are unique to the originator and which represent previously unknown combinations.

The need to know more about creativity as related to the visual arts is acute. Hastie, writing for the National Art Education Association, observed:
The research field in art education is wide open. Much more work is needed in the study of the creative process. . . . The function of art experience in programs for . . . those with special abilities in art has only been scratched on the surface by any serious investigations (15, p. ix).

In the senior-high school, particularly, very little research has been carried on. Areas especially needing study are: (a) the extent to which students at this level exhibit creativity, (b) the demonstration of that creativity, and (c) the quality of the art product involved. The ability to predict artistic creativity in senior high-school students has become increasingly important to school counselors. Moreover, setting up art programs which can bring out creativity or perhaps lead to its cultivation is felt to be the prime purpose of the art teacher.

Statement of the Problem

The problem of this study was to ascertain the degree and kind of relation which might exist between (a) certain measured indices of general creativity, ingenuity, and artistic judgment, and (b) teacher judgments of artistic creativity within a senior high-school art population.

One of the major purposes of the study was to identify a test or tests of creativity which might be used with senior high-school students to find those students with artistic potential who either should be counseled into art classes or for whom particular kinds of teaching
procedures should be developed. It appeared that if some reliable judgment of artistic possibilities of high-school students could be made by their counselors, more potentially productive students could probably be assigned for art training.

Other purposes included the possibility of setting up teaching situations which would serve to develop creativity in other fields as well as in art and to help students who show little or no evidence of creativity to discover their potential ability.

It was anticipated that outcomes of this study would point out areas for future study, among which might be suggestions for construction of more sensitive tests for the senior high-school art area and implications for revealing creativity in those students who, either through inept and unskilled handling of the tools of art or through personality maladjustments, showed little if any evidence of artistic ability.

Significance of the Study

Although interpretations of creativity have ranged from atomistic formulations of the stimulus-response psychologists to global concepts of the humanistic theorists, within the art field itself interpretation in psychological terms has tended to be gestaltist,
inasmuch as visual perception is more readily explained and understood through the gestalt tradition. The gestaltists, however, have been inclined to explain only the "field" which is perceived by the viewer of finished art products rather than the personality "field" of the producing artist, as in the approach of Arnheim (1) and, to a modified extent, of Lowenfeld (2).

Following closely in the gestalt tradition, but extending its principles to the organism as a whole, have been the holistic or organismic psychologists of whom Maslow, with emphasis on self-actualization, may be considered typical. To Maslow, creativity was a positive aspect of mental health; it is

... a universal characteristic of all... There is no exception. Each one shows in one way or another a special kind of creativeness or originality or inventiveness that has certain peculiar characteristics (30, p. 85).

Hilgard distinguished between two major types of approach to problem-solving and creativity.

The first of these relates problem-solving to learning and thinking, as a type of "higher mental process" or "cognitive process," to which problem-solving certainly belongs. The second approach, supplementary rather than contradictory to the first, sees creative problem-solving as a manifestation of personality and looks for social and motivational determinants instead of (or in addition to) the purely cognitive ones. It is not surprising that these two approaches deal also with somewhat different topics. The approach via
learning tends to emphasize problem-solving in which a high-order product emerges, although not necessarily a highly original one, whereas the approach via personality tends to seek out somewhat more the elements of creative imagination and novelty (16, p. 163).

The big cleavage in theoretical positions has been, then, between the stimulus-response, "bundle of habits" position, and that of the humanistic psychologists such as Maslow (28, 30, 31), Goldstein (9), Murray (20), and Rogers (34, 35). The latter appeared to offer more fruitful, though less practical, bases for research, particularly in the study of artistic creativity in high-school students, since they tended to regard creative expression as the manifestation of unique and complex personality components. MacKinnon and Maslow indicated a method of studying creativity which has gained acceptance in this country.

It has been true in the past and is still true in large measure that students of personality fall roughly into two classes: those who believe in a richness and complexity of personality structure and those who assert that personality has, at base, a simple structure and a relatively small number of traits or factors or dimensions. The clinicians, and most notably among them, the psychoanalysts, tend to favor the hypothesis of prodigality in the personality, while the experimentalists, and most notably among them, the factor analysts, are inclined to support the hypothesis of frugality of personality (28, pp. 632-633).

When the national need to know more about creativity became apparent, it was to be expected that the approach
used would involve a statistical technique already well known and highly developed in an attempt to obtain exact, measurable, and valid information about a complex aspect of human behavior. In 1950, Guilford (11, 12, 13, 14) began concerted efforts toward the identification of factors or constellations of traits involved in creativity, using the method of factorial analysis. His first studies indicated that thinking fell into either "convergent" or "divergent" patterns and that thinking which had been called "creative" was in the latter category. "Convergent thinking" was defined as that which produced one right answer and "divergent thinking" as that which could produce several right answers.

By 1957, Guilford (11), writing on creative abilities peculiar to the arts, had outlined characteristics of the creative thinker required for certain types of personnel in the military setting and had hypothesized that "the abilities that make these kinds of personnel creative might be the same as those that make the painter, the composer, the writer, and others creative ...." (11, p. 113). In summarizing this article, Guilford concluded:

... creative artistic talent is not a unitary or uniform commodity but is to be accounted for in terms of a large number of factors or primary mental abilities. From what is already known, we should expect that the creative abilities of artists will be found to involve some factors other than those among creative abilities in field such as science and management (11, p. 117).
Writing later on the psychology of creativity, Guilford elaborated on his previous conclusions:

The discussion of creative abilities should not be left without pointing out that much depends upon the context within which the thinking is conducted. It takes somewhat different abilities of fluency, flexibility, and elaboration to deal with concrete materials than it does to deal with abstract materials. A person can have these kinds of ability to a high degree in the one area and not in the other. It takes different abilities to be a highly creative writer than it does to be a highly creative artist, composer, or inventor. Very few, it would appear, can be outstanding in all fields. Leonardo da Vinci was probably an important exception. But parallel abilities, such as fluency, flexibility, and elaboration, apply in both concrete and abstract fields. Much of the success in creative production in any field, of course, depends upon the person's fund of special information within that field (13, p. 3).

Meanwhile, other psychologists, working in the same area, arrived at formulations regarding creativity and the aspects of the creative personality through other research methods, which tended in large measure to confirm Guilford's theories. Among these were Maslow (30, pp. 85-89), who described healthy self-actualizing people; Lowenfeld (25, p. 38), who isolated eight attributes which significantly differentiated the creative from the non-creative persons; and Barron (2, p. 164), who delineated in detail the characteristics of creative artists. All of these findings coincided to a high degree with Guilford's factors relating to creativity (11, pp. 111-115).
Studies in Art Education

Within the art-education field several investigators began research aimed at identifying the unique structure of artistic creativity, spurred on by such typical anticipations as that of Stoddard, "... we expect to find creativity to a high degree in the graphic arts" (38, p. 192). Various approaches to the problem were tried, among them the suggestion of Drevdahl that much information could be obtained through "the use of ... the subject whose creativity had been demonstrated" (7, p. 21). This same viewpoint appeared in the report of the Carnegie Corporation.

An individual is not creative in a vacuum. He is creative somewhere ... it may be possible to predict creativity. But starting from here and now, if you want to study that elusive quality you have to study people who have proved they are creative (3, p. 6).

Others, who had been involved with the arts over a long time, were less optimistic, however, as this statement by Iglehart would suggest:

The problem of early identification of those gifted in the visual arts has received sporadic attention over the past several decades. None of the various testing instruments developed during this time had proved useful, nor does the writer know of any serious use of such instruments. Attempts have ranged from an effort to measure the student's level of general art appreciation ... to personality diagnoses as based on projective techniques ... Although in each instance it has seemed clear that something was being measured, the nature of the characteristics under investigation has remained obscure.
Accurate identification of the gifted art student necessarily involves observation not only of his working process, but also of the tangible product—drawing, painting, sculpture, or the like. Here, real judgments can be made only by the competent and knowledgeable artist or art teacher (10, p. 123).

Related to or part of artistic creativity, with implications for testing, was the stress given motivation by Maslow:

The creation of art may be relatively motivated; i.e., when it seeks to communicate, to arouse emotion, to show, to do something to another person, or it may be relatively unmotivated; i.e., when it is expressive rather than communicative, intrapersonal rather than interpersonal. . . .

Very much to the point, however, is the question, "Is there a need for expression?" If there is, then artistic expression, as well as cathartic and release phenomena, is as motivated as food seeking or love seeking. . . the evidence will soon force us to recognize such a need to express in action whatever impulses have been aroused in the organism (31, p. 297).

An art educator, McFee, spoke of this same "need to express," which should be understood by art teachers:

As art teachers we sometimes assume that everyone "naturally" has something he wishes to express through art. Since art forms are found in almost all cultures this may be a basic need of man, but in our society there are many forces that have tended to separate the arts from the "mainstream" of our life. Stereotyped attitudes about artists, emphasis on expedience, practicability, and mass production can contribute to people's inability to identify themselves with art and art activities. Value conflicts about art and art processes can be found even in pre-school children. If skills are emphasized too early, the need to express can be stifled. The teacher needs to understand these influences in order to help more people overcome their reservations about becoming involved in art (26, pp. 1-2).
McFee indicated a second line of approach to creativity; that is, through the student's social field, which might be useful in the assessment of artistic creativity. This approach had been suggested also through the research activities of Murray (20), Goldstein (9), and Rogers (34). Holland (17), in his studies of talented adolescents, which were carried out for the National Merit Scholarship Corporation and used as a criterion of creativity in contest entries generally, compiled a rating for talented adolescents from the number of times a student's work had been entered in a contest. This rating applied to both written and artistic efforts. In addition, Holland used teacher judgments of performance in art and performance by students on an art judgment test.

Although writers of art education textbooks (3, 6, 23, 24, 27, 32) have made statements concerning adolescent and young adult artists and the literature on human development (4, 21, 29, 37) is well documented, no one has pinpointed the senior high-school art student, who, within a defining framework, has been acknowledged to be creative. Art teachers appeared to understand much of the creativity they saw emerging from their students as art products, but rarely were they able to define it or to predict its presence before demonstration. Both of
these conditions were implicit in a statement by McFee of the felt needs of art instructors:

As art educators we are concerned with two major questions: (1) What generalizations derived from research on the creative process can we use in organizing art activities in the . . . schools? (2) What can we do to help develop the creative potential of more children? (27, p. 130).

As the background of this study shows, the components of creativity have been defined through the use of factorial analysis and art tests using these components have been constructed; yet no tests have been made commercially available for the use of high schools in identifying artistically creative students. Educational practices based on careful research, which is not yet available, are urgently needed by art teachers. The need is for testing instruments which measure, even though not too sensitively, the qualities involved in artistic creativity of high-school students. So far, the only method available for giving estimates of students' artistic creativity has been the judgments of their teachers, who are themselves artistically creative and experienced in recognizing creativity in their students.

Preliminary thinking for this study suggested that out of the less than a dozen commercially available art tests and out of the few tests of creativity and ingenuity designed for other populations, one test or a combination
of tests might achieve what now depends entirely on teacher judgment. An independently assessed contest would offer confirmation or add rejection to tests and judgments.

Basic Assumptions

For the purpose of the study the following basic assumptions were made:

1. The student sample selected was drawn from a normal high-school population sufficiently large and varied in terms of background to insure an adequate study. It was easily possible, for statistical purposes, to make the assumption of a random sample drawn from a normal distribution.

2. The measuring devices used were responsible means of evaluating differences among students in art judgments, ingenuity and creativity, and art ability.

3. The teacher judgments with reference to art products of students were fair and unbiased.

4. The contest judging, used as a criterion of artistic creativity, was objective and impartial.

5. Creative senior high-school art students would have at their command a suitable repertoire of skills, concepts, and symbolizations with which to express themselves adequately through the visual arts. They would have sufficient mastery of tools—brushes, pens, and
other equipment—to handle color, line, and form adequately for self-expression.

Hypotheses

For the purpose of this study five hypotheses were tested:

1. Some measures are available by which it is possible to predict the artistic creativity of high-school art students.

2. Teacher judgments of high-school art products are sufficient to formulate a satisfactory basis of judgment of artistic creativity in high-school art students.

3. Teacher judgments of creativity in high-school art students are verified by the art products of these students within the framework of a comprehensive art contest open to all contest subjects.

4. Testing instruments used for ascertaining artistic creativity in high-school art students support teacher judgments of artistic creativity in these same students.

5. Teacher judgments, testing instruments and art contest entries are related.

Limitations of the Study

This study, with a time schedule covering the months of April and May, 1963, was limited to the consideration
of a student population selected from two large senior-high schools located in a city of 350,000 population. These students had elected a course in high-school art. Approximately 835 students comprised the total senior-high school art enrollment of the city; of this total, 285 students, or nearly one third of the total number, were used as subjects for the study population. Of the group, some were beginners; that is, the semester during which the study was made was also the first semester of art training in high school for some students. The latter group tended to be seniors who had needed a half unit of credit to complete their graduation requirements. Some few students were concluding, as seniors, their eighth semester of high-school art. Some students had received private instruction, particularly in painting, in such classes as those offered by the Junior League of the city in a Saturday morning program for gifted students. Several students had attended, during their intermediate- and junior-high-school years, crafts and drawing classes at the Children's Museum.

Pupils of four high-school art teachers were involved in the study. As was characteristic of the art student population studied, the general school populations from which the study group was drawn were also highly heterogeneous. One school served the entire west side of the
city; the other school, in a downtown location, served
the entire school district as a technical and vocational
which could be "chosen" by students residing anywhere in
the entire city. Both schools met identical academic
standards and requirements of their central administration.

Definition of Terms

For purposes of clarity, statements of certain key
terms are made.

1. High-school art student. For this study, the
high-school art student was defined as a student of either
sex who had voluntarily enrolled in a senior high-school
art class in which the curriculum was composed in part or
entirely of painting, drawing, printmaking, sculpture and
modeling, and crafts. His peer group was heterogeneous,
composed of tenth-, eleventh-, and twelfth-grade students
in two public senior high schools. Only members of the
white race were included.

2. Creativity. Roger's definition of creativity
was used for this study:

... the emergence in action of a novel relational
product, growing out of the uniqueness of the
individual on the one hand, and the materials,
events, people, or circumstances of his life on
the other (35, p. 71).

This general definition as adapted for the high-school art
student was interpreted to mean paintings, drawings,
prints, sculpture, and various crafts which were completely original to the student who produced them, and which grew out of the events, people, animals, situations, and environmental conditions which were a part of that student's life. His own experiences provided all the inspirational materials for which he felt a need, and he expressed himself as his own style uniquely dictated. He did not feel any need to copy nor to look for ideas from others or from books. While he might be slow in producing ideas and products, he was not threatened by an assignment, by looking for "right" answers, or by insistence on rigidly structured requirements.

3. **Artistic creativity.** Within the context of this study the terms "visual creativity" and "artistic creativity" were used synonymously, having a particular meaning. The following definition by McFee was used:

... In the arts, creativity may be called aesthetic problem-solving. It is a highly complex behavior which includes: (1) the ability to be aware sensitively of the cognitive and emotional, the tactile and visual elements of experience, (2) the need to express, the desire to give form to our responses to experience, (3) the ability to reconstruct, reorganize and symbolize what we evolve from our experience, (4) the ability to design, to integrate all the interrelated factors used in symbolic communication (form, line, color, and texture), and (5) to be flexible, exploratory, and skillful in the use of the tools and media of the arts (26, p. 1).

4. **Teacher judgments.** Teacher judgments were interpreted as the choices of a mature person who was
personally involved in varied art experiences and media, and who, through experience in the art classroom, has developed an intuitive feeling for and the ability to communicate with students who were also highly involved in the arts. Such a teacher would be able to assess the range of abilities, from very high to very low, in students with whom he has spent considerable time and artistic involvement in the classroom.

**Procedures for Collecting Data**

The following carefully organized procedures were used in collecting and assembling the data for this study:

1. The four high-school art teachers whose students comprised the subject group were asked to rate their students, on the basis of considered judgment, into three groups: (1) **High Creative**—those students who demonstrated uniqueness, distinctiveness, and a high degree of originality, both in their approach to art problems and in the art product which resulted. They were autonomous, independent, and confident. (2) **Middle creative**—those students who might possess creativity in some degree but were unable to express themselves well enough to demonstrate the trait visually, or students who generally revealed stereotyped responses with only occasional apparent insight. (3) **Low creative**—those students who through inertia, disinterest, or dullness
produced inept, scanty art work, revealing an obvious lack of creativity, both in process and in product. This entire group, divided into the preceding three broad categories, was designated for tabular purposes teacher judgment. Involving the entire subject population, teacher judgment formed the basis for a statistical approach to the problem.

2. The criterion of creativity, established independently of testing and teacher judgments, was the utilization of a city-wide contest for high-school art. This contest, sponsored annually by the Junior Chamber of Commerce and a large downtown bank, offered nominal prizes for highly original work. Distinguished by careful jurying, this contest offered to high-school art students an opportunity to have their work shown in public exhibition. Through the several years in which the contest has been conducted, the contest judges, usually not announced in advance of judging, have been persons of training, aesthetic judgment, and personal standing.

The art contest was organized around five divisions; in each division four places were offered. In addition, a Portfolio for Scholarship division, open to seniors only, offered three places. In all, a total of twenty-three prize-winning places were open. Despite limited exhibit space, a few additional art productions of high merit, but not prize winners, were hung.
To provide a numerical score for all students whose work was selected for the contest, for the purpose of this study the following ranking system was devised:

1. First Prize
   Senior Portfolio
   9 points

2. Second Prize
   Senior Portfolio
   6 points

3. Third Prize
   Senior Portfolio
   7 points

4. First Prize
   Contest Division
   6 points

5. Second Prize
   Contest Division
   5 points

6. Third Prize
   Contest Division
   4 points

7. Honorable Mention
   Contest Division
   3 points

8. Work Exhibited
   No prize
   2 points

9. Work Entered for Judging Only
   1 point

The rules of the contest, which limited entries to 20 per cent of the total class enrollment for each class, specified that "work must show originality—not copied work or pattern painting or forming" (19).

Ordinarily, student work entered by each teacher would have been selected by that teacher. For purposes of as much objectivity as could be obtained in the interest of this investigation, however, each art teacher entering student work for the contest had the assistance in selecting entries of an outside, experienced art teacher who did not know the students, nor was known by them. The following procedure was used: All work available for the contest and which seemed to merit consideration was assembled. The two teachers together selected the contest entries on the basis of definitions supplied from this study. It was agreed that choices should be unanimous and that in case of doubt the work was not to be entered.
3. To test students' artistic creativity four measures were utilized: two tests of general creativity and ingenuity and two tests of artistic judgment and performance. The tests were as follows:

(a) Cree Questionnaire. This test was developed by Thurston and Mellinger (5) and is described in the test manual as a "semi-disguised test of creativity and inventiveness." The test manual stated:

The Questionnaire can be used to identify potentially creative individuals. The research on which it is based indicates that creatively productive people tend to differ from less creative people in their responses to the items . . . (5, p. 1).

(b) Flanagan Aptitude Classification Test II. This test was developed by John C. Flanagan, who said of Test II-Ingenuity, "This is a test of your ability to think of ingenious and effective ways of doing things" (8, p. 52).

(c) Graves Design Judgment Test. This test was developed by Hailand Graves and was "designed to measure certain components of aptitude for the appreciation or production of art structure" (7, p. 2). This objective was accomplished by

. . . evaluating 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.

(d) Lewenz Tests in Fundamental Abilities of Visual Arts, Part I, Test 2—Originality of Line Drawing.
This test purported to assist in establishing "the range of originality and invention which the various pupils may express" (22, p. 3).

For the administration of these tests, the high-school class period of approximately 55 minutes was used as follows:

First day: Lewerenz Originality of Line Drawing, 20 minutes' time required; and Cree Questionnaire, untimed but generally requiring 20 minutes for adults.

Second day: Flanagan Ingenuity Test, requiring 24 minutes; and Graves Design Judgment Test, untimed, but generally requiring 20 to 30 minutes.

It would appear that the use of testing after entries had been made in the high-school art contest was somewhat out of an expected order. The additional caution of unbiased selection of these entries was adopted because it was necessary to enter the contest in early April. In order to allow all students to participate as fully as possible in the semester's art instruction, testing was delayed until the last possible part of the spring semester. Teacher judgments were requested before the contest was announced to students.

Procedures for Treating Data

Using teacher judgments in the categories of high-, middle-, and low-creativity, a simple analysis of variance
was made by an International Business Machines computer for the results of each test used with the student population and for the independent art contest. Significant differences occurred for each test and for the art contest. Student T-scores were then computed, also by I. B. M. processing, to find where these significant differences appeared, whether between high-medium, medium-low, or high-low groups. Conclusions were drawn from the statistical data thus obtained. These results are reported in Chapter IV of this study.

Summary

The purpose of this study was to determine the degree and kinds of relationship that existed between teacher judgments of artistic creativity in senior high-school students and results from certain measures of artistic judgment, originality, creativity, and ingenuity given to the same students.

An additional purpose was to locate a test or tests, commercially available, for use by counselors and art teachers in identifying artistic creativity in senior high-school students. Implications of the study included the possibility of setting up teaching situations which would enhance the spread of creativity from art to other areas and to help students in whom creativity was not in evidence to discover their potential ability.
The intensive study of creativity, generally within the past several years, has penetrated only in a limited way into the art-education field. Chapter II presents the background in which this study rests.


22. Lowerenz Tests in Fundamental Abilities of Visual Arts, Los Angeles, California Test Bureau, 1927.


CHAPTER II

CREATIVITY AND THE CREATIVE PERSON

With the close of World War II and the realization that national survival could depend upon brain power, the obligation of educators to locate and develop that power was imperative. Newly respected, the quality of creativity was one which had been known by artists, poets, and philosophers for centuries; but it was a quality to which a practical, materialistic value had infrequently been attached. Guiselin's statement seemed peculiarly pertinent:

The only reasonable step, at this point, then, is to act upon the supposition that our problems in world crisis, as at other times, may be soluble only creatively—that is, by a profound and thorough alteration of our inner life and of the outer forms in which life finds expression and support (18, p. 3).

Murray implied that civilization was already caught in an emotional deficiency disease, "a paralysis of the creative imagination, an addition to superficials . . . this is the diagnosis I would offer to account for the greater part of the widespread desperation of our time" (38, p. 10).
Olpin voiced an increasingly persistent fear that creativity would be stifled within the social milieu before it could be brought into active educational use:

I am constantly concerned over the fact that we in this country are becoming more subject to indoctrination than was the case before the invention of radio and television. I hope, therefore, that... as you examine the qualities that characterize creative talent, you will give a prominent place to courage; for without it, even the most original thinker may not be able to survive... (39, p. 3).

The grave tone indicated by these statements implied an immediate concern for the identification of the personalities possessing the quality of creativity.

Creativity Defined

Whether defined as imaginative action, productive thinking, uniqueness, or ingenuity, the allusion has been usually to a hard-to-define human characteristic. Givens' definition of creativity reflected the gist of the thinking of several researchers in the field of creativity.

Creativity may be defined as a uniquely human mental ability wherein an individual conceives a synthesis of ideas which is original for him, searches for deep meanings of the ideas, and seeks either to find their correspondence with reality or their relation to the thoughts of others (19, p. 296).

Eyring saw creativity as related to "the richness and variety of mental life," and he called it "the great gift of imagination... perhaps man's most distinctive trait, for it makes possible his creativeness" (14, p. 19).
Selye, speaking as a scientist, concluded:

You make a creative discovery when you can say that your discovery has these three characteristics: it is true, surprising, and generalizable (44, p. 30).

Thurstone emphasized a somewhat different attitude:

To be extremely intelligent is not the same as to be gifted in creative work. This may be taken as a hypothesis (49, p. 20).

Getzels and Jackson, in their exhaustive study of students in a private school, pursued the intent of Thurstone's definition:

... it is possible to begin by identifying two basic cognitive or intellective modes. The one mode tends toward retaining the known, learning the predetermined, and conserving what is. The second mode tends toward revising the known, exploring the undetermined, and constructing what might be. A person for whom the first mode or process is primary tends toward the usual and expected. A person for whom the second mode is primary tends toward the novel and speculative. The one favors certainty, the other risk. ...

Various terms have been used to describe the two processes. Guilford has suggested "convergent thinking" and "divergent thinking"; Rogers uses "defensiveness" and "openness"; Maslow "safety" and "growth." Whatever terms are used, it is clear that one process represents intellectual acquisitiveness and conformity, the other, intellectual inventiveness and innovation. One focuses on knowing what is already discovered, the other focuses on discovering what is yet to be known (17, pp. 13-14).

Another elaborate study of highly creative children was that of Torrance, who said he had chosen to define creative thinking as

... a process of sensing gaps or disturbing missing elements; forming ideas or hypotheses concerning
them; testing these hypotheses; and communicating the results, possibly modifying and retesting the hypotheses (50, pp. 16-17).

Ghiselin stated that "creation begins typically with a vague, even a confused excitement, some sort of yearning, hunch, or other pre-verbal intimation of approaching or potential resolution" (13, p. 4).

Together with Rogers' definition as given in Chapter I (see page 15), these statements provide some idea of the diversity of interpretation of the term creativity.

A Theoretical Explanation

In the introduction to this study, three theoretical positions of psychologists were outlined as frameworks within which creativity and creative individuals could be considered. These were (1) the "bundle of habits" theory of the associationists, (2) the "field" theory of the gestaltists, and (3) the "humanistic" approach of the personality psychologists. There is yet another psychological position which provides not so much a method of viewing creativity, as an explanation of where and how the creative act arises. This is the Freudian or psychoanalytic orientation, interpreting creativity as arising out of the id, which operates on the pleasure principle by which tensions within the id are reduced. According to Hall and Lindsey, "The id is the original system of
the personality; it is the matrix within which the ego and the superego become differentiated" (23, p. 32).

They further defined the id:

The id consists of everything psychological that is inherited and that is present at birth, including the instincts. It is the reservoir of psychic energy and furnishes all of the power for the operation of the other two systems. Freud called the id the "true psychic reality" because it represents the inner world of subjective experience and has no knowledge of objective reality.

The id cannot tolerate increases of energy which are experienced as uncomfortable states of tension. Consequently, when the tension level of the organism is raised, either as a result of external stimulation or of internally produced excitations, the id functions in such a manner as to discharge the tension immediately and return the organism to a comfortably constant and low energy level. This principle of tension reduction by which the id operates is called the pleasure principle (23, p. 33).

To serve it in reducing tension and obtaining pleasure, the id has available for its use two processes: the reflex action, which includes such inborn and automatic reactions as sneezing and blinking, and the primary process, which provides the id with wish-fulfilling images such as those in dreams.

It must be remembered that in Freud's system no psychic material was lost; and thoughts, wishes, and dreams were repressed in the unconscious. Getzels and Jackson, following their interpretation of psychoanalytic and Neo-psychoanalytic conceptions, said:
The source of creativity in conflict is stated quite explicitly by Freud, and in fact a parallel is drawn between conflict as the genesis of neurosis and conflict as the genesis of creativity (17, p. 89).

Felix Deutsch (12), in a recent paper entitled "Body, Mind, and Art," cites Freud as saying, "The forces motivating the artist are the same conflicts which drive other people into neurosis." The base of the conflicts is in the unconscious, and so is the creative as well as the neurotic solution to the conflicts.

Schnier (43), in typically Freudian context, regarded all artistic creativity as a restitution process in which the destructive impulses of infancy remain in the unconscious of mature individuals. By means of the creative act people can atone for such impulses; through the work of art, objects originally destroyed in fantasy are brought back to life.

Thus, in strictly Freudian interpretation, to be creative is to be neurotic. Freud's views have been expanded, carried to apparently more logical conclusions, and reoriented by later psychoanalysts and Neo-Freudians, so that creativity has become a healthy function of a normal personality. Kubie, who, while identifying himself as firmly in the psychoanalytic tradition, reinterpreted the unconscious as including also a preconscious:
It would come closer to the truth . . . to say that the creative person is one who, in some manner, which today is still accidental, has retained his capacity to use his preconscious functions more freely than is true of others who may potentially be equally gifted (27, p. 43).

Getzels and Jackson (17, p. 96) made the point that this capacity may be the distinguishing feature of the adolescents they found to be highly creative and highly intelligent, since, in Kubie's words, "The contribution of preconscious processes to creativity depends upon their freedom in gathering, assembling, comparing, and reshuffling of ideas" (27, p. 37). Getzels and Jackson concluded that the "most influential current systematic approach to creative thinking is the psychoanalytic one, a conceptualisation which, at least in the psychological literature, is steadily gaining in pre-eminence" (17, p. 86); and commented that though no theoretical psychological view was a part of their original design in their studies of many gifted adolescents (17, p. 92), yet they have become increasingly appreciative of the Freudian viewpoints, which, they said, "do seem to resonate in our observations of the creative and noncreative child more than do, say, the 'logical,' 'associationist,' or Gestalt notions."

Another important variation of the Freudian concepts giving rise to creativity was that of Maslow (35, 36),
 psychoanalytically trained and oriented, whose humanistic, personalistic stress on self-actualization has particular import for the understanding of creativity. McPherson reported Maslow as believing that the healthy person

... who creates has managed a fusion and synthesis of both the primary and the secondary processes of creativity; both conscious and the unconscious; both of deeper self and of conscious self. He believes that it is possible for this fusion to take place but that it is not very common (34, p. 95).

Further differentiating between "primary creativeness" and "secondary creativeness," Maslow explained what he meant by "fusion":

What happens in this fusion is that both the primary processes and the secondary processes partake of each other, then change in character. The unconscious doesn't become frightening any more. This in the person who can live with his unconscious; live with, let's say, his childishness, his fantasy, his imagination, his wish fulfillment, his femininity, his poetic quality, his crazy quality. He is the person, as one psychoanalyst said in a nice phrase, "who can regress in the service of ego." This is voluntary regression (34, p. 95).

More recently, Maslow wrote:

One especially important finding in self-actualizing people is that they tend to integrate the Freudian dichotomies and trichotomies, i.e., the conscious, preconscious, and the unconscious (as well as id, ego, superego). The Freudian "instincts" and the defenses are less sharply set off against each other. ... The primary and secondary cognitive processes are more equally available and more equally valued (instead of the primary processes being stigmatized as pathological). Indeed, in the "peak experience" the walls between them tend to fall altogether (36, p. 43).
The emphasis on self-actualization and "peak experiences" would appear to be only part of a new feeling, a complete switch in orientation, which has appeared frequently enough in this country now to have far-reaching implications for the understanding of and insistence on creativity development.

The Existential Attitude and Creativity

A view new to educational leaders of man's creative needs has become apparent, one which has grown out of man's perception of his world. This attitude has become a kind of perceptual theory, rooted in the question: "Who am I?" rather than in an objects field which formed the basis for the Gestaltists' perceptual formulations. Getzels and Jackson (17, pp. 111-115) presented this attitude as the last of their theoretical explanations of the creativity of the gifted adolescents in their extended study, drawing heavily from the theorizing of Schactel (42), and stressing the "openness of the individual to the world about him," or as Schactel might put it.

... in the existential struggle between the two tendencies in man: to remain open toward the world, capable of allocentric perception, or to seek the security of secondary embeddedness in a closed world and in the shared autocentricity of familiar perspective, creativity signifies the victory of the first tendency over the second (42, p. 183).
Pallico, in considering the relationship of art and existentialism, said:

In existential terms, the question of art remains intrinsically tied to an ontology of existence and of being generally. The basic form of the question is: How must a being be constituted, in his very being, so that art can be possible? Admittedly, such a question is enough to overwhelm and discourage any inquirer. But philosophy itself, in the existentialist tradition, is at bottom nothing but a kind of courage (pp. vii-viii).

Read, in a discussion of a type of continental art which has grown out of existential thinking, expressed doubts that such a development must necessarily follow elsewhere:

Existentialism is by no means a universal philosophy, and we cannot assume that an abstract art giving perfect expression to this metaphysical attitude will ever be generally accepted in any country. At present the adoption of such an attitude, whether in philosophy or art, is a matter for individual choice (p. 219).

Concerned for a psychology of personality based in existentialism, Allport has conjectured:

Just how far the existentialist movement, already well developed in philosophy, literature, and theology, will affect the psychology of personality we cannot yet predict. Already it seems to be a needed blood transfusion. The propositions of existentialism are for the most part stated abstractly or in metaphor, but even so they admonish psychology to strengthen itself in those areas where today it is weak. Existentialism calls for a doctrine of an active intellect, for more emphasis upon appropriate functions, including self-objectification and oriented becoming. In particular it calls for a wider and fresher view of anxiety, of courage, and of freedom (pp. 79-80).
Maslow (35, 36), affirming his goal of a self-actualization psychology, pointed out the change in thinking which has occurred:

When the philosophy of man (his nature, his goals, his potentialities, his fulfillment) changes, then everything changes. Not only the philosophy of politics, of economics, of ethics and values, of interpersonal relations and of history itself changes, but also the philosophy of education, the theory of how to help men become what they can and deeply need to become.

We are now in the middle of such a change in the conception of man's capacities, potentialities, and goals. A new vision is emerging of the possibilities of man and his destiny, and its implications are many. Not only for our conceptions of education, but also for science, politics, literature, economics, religion, and even our conceptions of the non-human world (35, p. 47).

The personal quest to answer the question, "Who am I?", and the search of some psychologists to answer the question, "What can a person become?", have apparently been answered, at least in part, by the people now defined as creative.

The Creative Person

However creativity is explained—as arising out of habits, out of the repressed unconscious, out of the social milieu, or from a genetic basis, whether discovered by observation or by a statistical elimination procedure—it is clear that the people who possess this quality stand apart from their fellows in several distinctive ways.
An intensive study of adults identified as creative by their own professional and vocational groups, now in its eighth year, supported by a Carnegie Foundation grant, is the University of California's Institute of Personality Assessment and Research. Reports on this study (10) have indicated that it may eventually be possible to predict creativity, but the intensive study of many creative persons will have to be a preliminary step. The method used in the study is that developed by the Office of Strategic Services during World War II, involving the administration of a number of different tests, questionnaires, personal interviews, and the eliciting of biographical information. In this way, a composite picture of the person emerges, revealing his attitudes, values, interests, preferences, and life history.

Findings from this study revealed that highly creative people were at least fairly intelligent; however, there appeared to be a point beyond which intelligence was not crucial. Aptitudes were important; early in life these people had shown the skills necessary to their ultimate careers. All scored high on the interests which led them into their professions or occupations, and to a high degree they have demonstrated ability in their chosen field. Other findings, according to the Carnegie Corporation,
... support the hypothesis that creative individuals are more able than most to give expression to opposite sides of their nature, to achieve a reconciliation of the conscious and unconscious, reason and passion, rational and irrational, science and art. All the highly creative male groups studied, for example, scored high on a "femininity" test: more open in their feelings and emotions, more sensitively aware of themselves and others, and possessing wide-ranging interests—traits which in our culture are considered "feminine." On the other hand, most of them were not effeminate in manner or appearance, but instead assertive, dominant, and self-confident (10, p. 3).

The Carnegie report found that creative persons seemed to have a positive preference for complexity—even for what appeared as disorder. In describing the "personality types" framework within which subjects were classified, the Carnegie report concluded:

... three out of every four persons are sense perceptive. They concentrate on things presented to their five senses, and they focus their attention upon existing facts. The one out of every four who perceives intuitively looks expectantly for a link between something present and something not yet thought of, focusing habitually upon possibilities.

Highly creative people in all fields are overwhelmingly intuitive: 93 per cent of the writers, 90 per cent of the mathematicians, 100 per cent of the most creative architects (10, p. 4).

Givens (19) listed these qualities of creative persons: they are curious, intelligent, critical, independent, original, and spontaneous. They have definite theoretical and aesthetic values, have the ability to synthesize, and show a persistence in the development of ideas. They are challenged rather than confused by disorder. They show
courage to reveal themselves and are likely to view themselves as processes rather than as products. They recognize that there are many ways of interpreting the same situation.

Barron proposed the following statements as descriptive of creative artists and perhaps also of creative scientists:

They see things as others do, but also as others do not. They are thus independent in their cognition, and they also value clearer cognition. . . . They are by constitution more vigorous and have available to them an exceptional fund of psychic and physical energy.

They have more contact than most people do with the life of the unconscious—-with fantasy, reverie, the world of imagination. They have exceptionally broad and flexible awareness of themselves. The self is strongest when it can regress (admit primitive fantasies, naive ideas, tabooed impulses into consciousness and behavior), and yet return to a high degree of rationality and self-criticism (4, p. 161). MacKinnon remarked in the summary of his study:

There are many paths along which persons travel toward the full development and expression of their creative potential, and there is no single mold into which all who are creative will fit. The full and complete picturing of the creative person will require many images (32, p. 69).

Assembling these "many images" has been and still remains a nation-wide, complex development, requiring the skilled thinking of many patient researchers.

Research Background

When some conception of the national need to identify creative talent became evident, the result was that of
unprecedented activity throughout the nation. In 1950, the Congress of the United States enacted a bill establishing the National Science Foundation, which was charged by law with the responsibility for developing and encouraging the pursuit of a national policy for the promotion of basic research in the sciences.

Private business and philanthropy through various funds, grants, and subsidies also joined in the effort to assess types of creativity for numerous areas. The whole picture caught public attention as have few other equally worthy areas. Public education received virtually a mandate to stress creativity in teaching the nation's children. Probably the issue assumed also features of a status symbol. A few of the settings in which research occurred and in which it is presently progressing are presented here.

Taylor (45, 47, 48) and his associates at the University of Utah have been engaged for several years, under contracts with the Air Force and the National Air Space Administration, in studies on the identification of creative scientific talent. At three biennial conferences, their findings have been presented and pooled with those findings from other areas which are related. The research studies and the conferences have been supported by the National Science Foundation.

Under a grant from the General Motors Corporation at the Psychometric Laboratory of the University of North
Carolina, Thurstone and Mellinger (11, p. 6) undertook in 1954 to identify creative-inventive talent. From this research the Grey Questionnaire (11), used as a testing instrument in this study, was developed. The project was initiated by the A. C. Sparkplug Division of General Motors Corporation.

Since 1956, the Carnegie Corporation has supported the Institute of Personality at the University of California. According to its director, MacKinnon, the Institute has sought "the scientific answers to the mystery of human personality, biology, intelligence, and intuition that makes some persons more creative than others" (32, p. 15).

Guilford (21, 22) and his associates, in the Aptitudes Project at the University of California, have been engaged since 1950 under contract with the Office of Naval Research in defining high-level aptitudes of creative scientific talent.

Of great interest to education have been two long-term research projects, both of which have now been reported in full. (1) Getzels and Jackson (17), at the University of Chicago, studied the gifted adolescent in both intelligence and creativity aspects; and (2) Torrance (50), in the Bureau of Educational Research at the University of Minnesota, studied creative talent in children.
Although research in creativity is progressing, a statement by Taylor warned, "A major problem facing educators is to speed up the application of research findings from pertinent fields" (48, p. 9).

**Bridging the Hiatus**

The popular notion about research includes the connotation, perhaps a stereotype, that "all is now well, research has been done for that subject." Here is a fallacy that may be the Achilles' heel of modern education. A penetrating statement about the little-considered role of development was made by Taylor, Chiselin, and Wolfer.

Today, there is scanty assurance that the many basic research findings with potential relevance to education will quickly—or ever—be applied in determining what happens in the classroom. Yet a great and immediate need exists for speedy action to close the gap between what is known through research and what is applied in educational practice (46, p. 23).

Following a careful study of scientific methods which might have unrecognized implications to improve educational practice, these writers reported that they were shocked, as they believed others would be, "to see how comparatively little has been done to make relevant research findings useful for education." On this problem they declared:

The difficulty and importance of the developmental problem—the problem of making research findings bear upon practice—may be seen in the way ideas of creativity have come to affect our thinking about education. But it will take great time and effort to shape into a form usable by teachers even a few of the most
fundamental insights in the field of creativity. Only recently have tests of creativity, when adapted to use in the schoolroom and applied there in exploratory studies, revealed that a shocking misevaluation of giftedness has occurred in the schools through excessive dependence upon the I. Q. as the sole measure of superior ability.

Within military, government, and business settings, personnel and capital are available for the development of research; but within the educational setting, only research which has caught the imagination or immediate needs of the public has tended to be developed. Fleming pointed out the encouraging fact, however, that the studies of Getzel and Jackson (17) have begun to affect college entrance standards.

Within the next ten years, these findings are expected to have enormous influence on college admissions boards and scholarship committees. No longer will the well-dressed, polite boy with the straight A's be greeted with open application forms. . . . Already, the National Merit Award Scholarship Corporation has set up a new category for creative students (6, p. 52).

Taylor's statement that creativity research has "been done primarily in the sciences, so researchers need to determine which of the results generalize to the arts" (16, p. 9) is a valid one for art education. Coming from a scientist, his conclusion is important: "As I have stated many times before . . . science may have much more to learn from the arts than vice versa."
Creativity in Art Education

Leaders within the field of art education are anxious to see research and its consequent development carried on, leaning heavily on the creativity research in other areas where possible to avoid useless duplications of time and effort. There is now a bulk of useful, generalizable research having implications for art education, and it is recognized that the time has come, in fact, is overdue, when art education, with methods and content peculiar to no other field, needs to assume its own responsibility for organized research.

The fifth yearbook of the National Art Education Association (1954) was the first yearbook of the Association devoted to research. It represented a significant step for the relatively small and recent (1924) Art Education Association. In the first yearbook, Mix expressed much of the feeling of the thinking members of the organization:

Art educators are in a very uncomfortable state of mind with respect to research. Out of repeated experience, they are convinced that no activities in education are more beneficial to the development of good personality or more contributive to the improvement of general cultural conditions than are the arts. . . . We have an uneasy feeling . . . that practically all we have or research in art education is pretty feeble stuff from the point of view of the advanced research technician. We are full of guilt feelings (13, p. 7).
In addition to the feelings of inadequacy experienced by leaders in the art-education field, in contrast to the maturity and sophistication of other subject-matter areas, there is a restraining influence within art-education practice itself. As Hastie pointed out:

Many individuals who are producers of art or teachers of art do not like to measure anything related to the creative process. They honestly feel that this cannot be done. They think that if any attempt is made to measure anything about the process that somehow the whole thing will be "spoiled". . . . Art educators are committed to the thesis that what happens to the child in the creative process is more important than the resulting art product. . . . Measurement is not in itself wrong. It is rather that the available tools and methods may not give an accurate account of what is going on inside a human being when he engaged in an art experience (25, pp. vi-vii).

On the progress in research in art education, Hastie continued:

Only the foreword to any true body of research in art education has been completed. Beginnings have been made at hundreds of specific points. Emphasis has been on research by individuals each following his own line of interests. These individual efforts have brought some important successes, but these are only small fragments of the total pattern of attack which is necessary to solve major problems and issues (25, p. viii).

At the present time, the most extensive research in art education is being carried on at Pennsylvania State University. The art-education department of this university was established by the late Viktor Lowenfeld, who brought with him from his native Austria a personal
theory of art education which was largely rooted in the gestalt tradition. So great was this man's professional and personal influence, it seems a safe assertion to make that this theory of art education is now largely in use in the schools of the United States. The university was fortunate in having available enough of Lowenfeld's graduate students that, following his death, the department has been competently carrying out his professional legacy. Research at Pennsylvania State University is chiefly in charge of Beittel (5, 8), who has drawn from Guilford's tests of creativity and from similar but completely original approaches made at Pennsylvania State University, largely by Brittain (6, 6). Experimental tests in creativity have been produced and evaluated, the results of which are reported at long intervals of time. These tests were designed, however, for particular research projects; and, while the department has been gracious in granting requests for their use, they generally are not adapted to widespread testing situations. As yet, Pennsylvania State University has not released a general test of artistic creativity for which reliability and validity are reported.

Writing as a research psychologist outside the art-education field, Hartman said:

The most urgent of all research tasks in any field of investigation is the measurement of the
objectives of that field. The objectives of art education are the behaviors of students. These objectives are not the traditional criteria of education such as skills, attitudes, critical thinking, and others delineated in Bloom's well-known taxonomy. Nor is the art educator concerned with excellent artistic production, per se; this is the objective of the fine arts program. The art educator has delimited his interest in behavior to three major areas. These areas he desires to influence through his educational procedures. They are:

1. Creativity--originality in thinking--skill in the composition and solution of problems.

2. Personal adjustment--the adequacy of personal solution to the problems of living, sometimes defined as self-description, but always, ultimately, a matter of expert judgment.


It is the contention of the writer that art education has committed itself almost entirely to these three kinds of objectives and that it is this very commitment which differentiates art education from other educational professions. Therefore, the program for research in art education consists of defining and measuring those classes of objectives and testing theories stated in terms of those objectives (24, pp. 5-6).

Sarkan pointed out directions for future study in art education:

Continued attention needs to be given to the problems of refining and sharpening the descriptive criteria for components of the creative process. At the same time, however, research on such problems needs to be accompanied by speculative development of inferred relationships among the components. Research needs to include continuous attention to thoughtful theory building (3, pp. 50-61).

McFee suggested that at the present time the following theories could be found in the practice of art education:
Naive realism is practiced when a teacher assumes that the only reason for differences in students' ability to draw is due to differences in motor skills and training.

The intellectualist theory based on Goodenough's (20) research identifies knowledge as the chief variable in what a child draws.

The haptic and visual concept of child art postulated by Lowenfeld (30, 31).

The perceptual development theory as formulated by Arnheim (2) points out the tendency of perception to develop from whole to parts.

The theory of developmental stages in child art has long been assumed to be a biogenetic age-based phenomenon without consideration of the side range of environmental variables (33, p. 11).

Of one of these, Hartman elaborated:

The use of art educational methods to increase creative behavior was the special theoretical province of the late Viktor Lowenfeld. According to Lowenfeld, originality is a universal ability much as intelligence was defined by Binet and Spearman. It is not specific to any area of subject matter, but is rather a talent for freer, more original thought in any area the thinker chooses to consider. Lowenfeld envisions creativity to have properties similar to Freud's concept of libidinal energy. Creativity is inherent in all of us but it is repressed by rigid conceptualizations and systems of thought, and by lack of self-confidence developed through persistent failure. Experience with the graphic arts can release this repressed creative energy because the repression exists chiefly in the form of verbal symbols. By giving a person a chance to express himself in pictorial symbols the repression process is circumvented since the repression applies to verbal, not pictorial, symbols. The creative energy is released in the graphic arts experience. Once the creative energy has been made available in one symbolic system, it can gradually be introduced in the others. Thus the creative process in the graphic arts is transferable, resulting in creative behavior in other fields of endeavor as well.
This is an oversimplification of Lowenfeld's position, of course, but it is sufficient to indicate the boldness of that position and some of the research ideas which bold commitment can generate. If creativity is universal rather than specific, creative performance in various tasks should be highly correlated and a factor analysis should yield a common factor. If creative energy is transferable and experience in the graphic arts capable of increasing the amount of energy available, then a sufficient course in art education should yield increases in the creative solution of diverse problems from mathematics to engineering. Such conceptions are readily transferable into research programs capable of supporting or refuting them. It is the hallmark of good theory that it be stated with sufficient clarity to allow its truth or falsity to be experimentally determined. It is a tribute to Lowenfeld's strength as a systematist that much of his system has been sufficiently defined to allow testing (24, p. 6).

Then, returning to what is the essential concern of this investigation, Hartman added:

But no research on the Lowenfeld, or any other, theory of creativity is possible unless creativity itself can be properly defined and measured. At present there are two major methods available for objectifying creative behavior: one is to determine the degree to which behavior is creative by expert judgment; the other is to redefine some solutions to standard problems as more creative than others. This latter method also depends ultimately on expert opinion. Measures depending upon expert opinion are never really satisfactory unless very high agreement can be demonstrated among the experts. So far this demonstration has not been made. Productivity seems a more objective criterion and has not yet received enough attention, but a satisfactory definition of creativity has not yet been achieved, and progress in this area must be necessarily slow until the deficiency is remedied (24, p. 6).

It was precisely within the area defined in the above paragraph that this investigation was planned.
Research in High-school Art

Progress in defining the creative high-school art student has been slow, and the area is not likely to be one which will attract many investigations. Torrance wrote pointedly on the subject:

Perhaps this is because his teachers realize he will change before adulthood, but little has been found out about the senior high-school art student. The senior-high school represents so far as art is concerned an educational waste-land (50, p. 2).

In the meantime, the need to define the quality of visual creativity in high-school art students and to conduct research studies with them continues. Torrance wrote:

Of the different educational levels, the high-school years have perhaps been the most neglected in creativity research. . . . Apparently, educators have not had much interest in the "creative imagination" of high-school students. . . . It has been deemed appropriate for colleges to produce professionally trained people who will make creative contributions. No such expectations exist for high schools (50, pp. 28-29).

Creative growth has seldom been recognized as an objective of secondary education. Discouraging though the attitude toward high-school art may sometimes appear, an even more discouraging task, one that must be squarely faced, is the necessity to find criteria for artistic creativity.
Criteria for Artistic Creativity

Art products are not either right or wrong. As the result of divergent thinking, most artistic works will have elements of rightness and wrongness which may add up to an impression of generally "good" or generally "poor" in the eyes of the experienced beholder. What appears "good," however, to one viewer will leave another viewer indifferent. Because perceptual backgrounds vary with the experience and appreciation of art, evaluation of emotional products cannot be made by applying a previously determined scale. This problem is generally true for the evaluation of all creative production and for assessment of the creativity of the personality producing the product.

As reported in the Introduction, this investigation used judgments by experienced teachers of completed art products as the primary criterion. In addition, seeking to determine the relationship and extent to which some other criterion of the same products would agree or disagree, an independently judged art contest was used. Obviously, all judgments made were subjective, too much so to satisfy the more scientifically oriented observer.

It is a truism among art educators that the "teacher knows." The teacher, who is himself a practicing artist, who has been involved deeply in the processes of art, has
experienced the emotions, problems, choices, dissatisfactions, and elations of producing art. Thus teacher judgments have been practically the only means of identifying the artistically creative high-school student. In this connection, Iglehart's statement is typical:

Real judgments can be made only by the competent and knowledgeable artist or art teacher. No evaluation can be made by direct comparison with the work of the adult artist . . . (26. p. 124).

The problem of criteria is not confined to judgment of art products; the problem is sufficiently disturbing to have caused the Research Conferences on the Identification of Creative Scientific Talent, sponsored by the University of Utah, to establish a permanent committee on criteria of creativity and to consider the problem in general sessions. From the third conference, Stein reported:

The main obstacle to the prediction of creativity is the criterion problem. A review of the literature reveals that a variety of criteria have been used. For purposes of this discussion, the criteria that have been used are grouped on the following categories: (1) The "by definition" group--This group includes those studies that have devoted themselves to investigating the processes or characteristics of individuals who are engaged in professions or occupations—painting, sculpture, science—that are generally regarded as creative. . . . (2) The statistical or test criterion group—In this category are those studies in which deviation from a norm or specific test score on one or more tests is used as a criterion for differentiating between groups of individuals;
(3) The "qualified or expert judgment" criterion; (4) Products--This group differentiates among individuals in terms of the number of products they have produced; (5) "Ultimate criteria"--This group has not yet produced any empirical research . . . ; (6) "Individualized" criteria--This group too, has not yet produced any empirical research. It is composed of those investigators who assume that each of us has the potentiality for creativity or that creativity is a drive within the organism which is manifested in self-actualizing tendencies . . .

In so far as the prediction problem is concerned all of the studies in each of the six categories of criteria have sooner or later to face the problem of the relationship between a psychological criterion and a standard of performance . . .

Standards of performance are set by "significant groups of others" (45, p. 179).

Through its committee on criteria, the third Utah Research Conference on the Identification of Creative Scientific Talent also adopted a tentative standard, one which would be questioned by art educators:

**Products as the solution to the criterion problem.** The criterion problem consists essentially of identifying individuals who have positively and clearly demonstrated possession of the trait of creativity (47, p. 292).

Most art educators would be in accord with part of the preceding statement; in Brittain's words they would agree that "within the confines of an art population the range of creativity is different both qualitatively and quantitatively from other populations" (8, p. 60). Most art educators, however, probably would disagree with the scientists that only product should be considered.
Kuma's statement that "process is identified as an intangible and dynamic force that results in form" (29, p. 18) is probably a general feeling, implying that process is as important as product. Another art educator, Reed, probably spoke for his area generally, especially in his stress on the person involved:

Can creativity be arranged on an evaluation scale? Do we evaluate accomplishment or effort? Do we evaluate the person, the process, the product—or all three?

The product is a physical representation of the creative process and the personality expressed. Only a very general scale can be devised for evaluating creative products, as creativity itself is a uniquely personal and individual affair. The product isolated by itself is of little or no worth in evaluation. The process and the product are organically intertwined. So our evaluation must be given in terms of what we know from having watched the creativity from its inception through completion. The creative process is not only an indication of growth but also an instrument of growth.

In order to make a valid evaluation of the product and process we must know the creator... (hl. p. 192).

Some of the basic disagreement within the art education field, which must be resolved before a body of research can be built up is implied. Such research as is relevant in this area is presented in the following section.

Related Studies

Since the senior-high school to repeat Torrance's apt phrase "represents so far as art is concerned, an
It is not surprising that very little related literature is available. No new art tests have been placed on the market since a study by Brittain (7) in 1952. In this study, Brittain evaluated nine art tests and several creativity tests for suggestions that would be useful in the construction of an experimental test. The testing instruments were not actually used with art populations.

Although populations for testing experimental art studies tend to be college art-education classes, two studies were found in which senior high-school populations were used. One was Burkhart's (9) analysis of the paintings of 80 students as they progressed through the school year, in which a measure of individuality of art expression was developed, making use of verbal criteria and expert judgment of art works. Work was assessed at three levels—outstanding, average, and low. The form of the investigation was crystallized by the analysis of these three groups of students working at apparently different levels of individuality of expression. The second was Michael's study (37), which used a population of 160 high-school art students and two teachers and which sought to determine the effect of external influences such as awards, reproductions, and peer art work as teaching aids. This study utilized three measures of art products of the pupils.
The three measures, all adapted or developed at Pennsylvania State University, were (1) Uniqueness of Self-Concept Scale, (2) High School art Work Preference Test, and (3) Art Acceptance Scale. A diary was kept for each class. Although findings were scattered, this conclusion was of particular interest: "The group was so influenced by the external award ($10) that the pupil's art products decreased significantly in the quality of individuality or creative expression."

Lanier (29) listed 430 doctoral dissertations in art education which had been completed in universities in the United States and Canada since 1930; he pointed out that this group represented an "appreciable total of separate investigations dealing with a broad spectrum of specific problems." Those dissertations which have similarity to this study are listed below.


Flick, Paul E., "An Intercorrelative Study of Two Creative Types: The Visual Type and the Haptic Type," Department of Art, Pennsylvania State University, 1960.


Kincaid, Clarence E., "The Determination and Description of Various Creative Attributes of Children," Department of Art, Pennsylvania State University, 1960.


Summary

Creativity research, particularly in the sciences, has been an active and expanding field since World War II.

With the help of government and philanthropic aid,
considerable progress has been made. Business has carried research in creativity into personnel selection with the development of tests for specific business uses.

The relatively small art-education field, with limited grants, has, nevertheless, been engaged in some creativity research for art education. While a mass of information is being accumulated, development of specific practices has not followed as yet. At least a part of the time lag is attributable to the failure to develop testing instruments which are generally usable. Such instruments are needed at once to assist in development of teaching practice for the use of school counselors and to aid the art teacher in the classroom.

To locate such tests was one of the purposes of the present study. Chapter III describes the procedures followed.
CHAPTER BIBLIOGRAPHY


CHAPTER III

METHODS AND PROCEDURES

The problem of this study was to ascertain the degree and kind of relation which existed between (1) certain measured indices of general creativity, ingenuity, artistic judgment, and performance and (2) teacher judgments of artistic creativity within a senior-high school population. The procedures used in attacking this problem are presented in this chapter in the following order: (1) selection of the problem, (2) selection of the subject population, (3) procedures followed, (4) tests selected and opinions of the tests, and (5) statistical treatment of the data.

Selection of the Problem

The comparatively small amount of research which has been done in art education is generally uncorrelated and scattered. Largely carried out for doctoral degrees, it has seemed to grow out of the felt needs of individuals, rather than as a part of a concerted effort to answer problems of interest to the entire art-education field.

The present study also grew out of a definite need—the need to find a specific test or combination of tests.
already available in forms usable with large numbers of students, which could be depended upon to measure artistic creativity in senior high-school students. It was hoped that the results of this study would serve a useful purpose for other investigators and that the findings would help to relieve a constricted situation which, it was believed, tended to inhibit research in art education.

Nine copyrighted art tests were found, all of them over fifteen years old, which purported to assess some phase of artistic ability—aesthetic judgment, performance, informational capacity, or some degree of sophistication in the visual arts. None of these tests were reported as measuring the specific quality of artistic creativity. However, several tests of general creativity, particularly those developed for business use, were available, all of which were produced within the last decade.

It was anticipated that some combination of these various tests, or perhaps even a single test, might reveal artistic creativity in senior high-school students sufficiently well to be usable until more sophisticated tests were placed on the market. Although the literature of the art-education field revealed that such tests were planned, no single test of artistic creativity with established validity and reliability for senior high-school students was found to be available.
Teacher judgments have traditionally been the only reliable means of determining whether or not a student was artistically creative. Thus, for this study, teacher judgments of students with whom the teachers had been in daily communication over a period of several months—often several semesters—became the framework within which the administered tests were to be evaluated. As an additional criterion or confirmation, an independently juried high-school art contest (3), the rules of which specified highly original work for entry, was used.

Selection of Student Population

In order to level out individual variations within groups, it was evident that a large student population should be tested for this study. It was planned that not fewer than fifty students would appear in any of the three categories of high-, middle-, or low-artistic creativity, as determined by teacher judgments.

As reported in Chapter I (see page 14), approximately 33% students comprised the total senior high-school art population of the city; and of this total, 28% students, or nearly one third of the total number, were used as subjects for the study population. Comprising the entire art enrollment from two large urban high schools, these students represented a heterogeneous mixture of backgrounds and experiences in art training.
The test population was made up of both sexes and contained tenth-, eleventh-, and twelfth-grade students, all of whom had elected an art course. Several students were terminal seniors who had needed an elective course. Other students had spent as many as eight semesters in high-school art and looked forward to a vocation involving art. Some students preferred manipulative, craft-type, and three-dimensional art; others were interested only in brush and pen, two-dimensional type of media.

In the high-creative group there were 67 students, in the middle-creative group, 171 students, and in the low-creative group, 47 students. Originally just reaching the fifty-member requirement as established in the preliminary planning for this study, the low-creative group emerged from the testing with 47 subjects tested. Drop-outs, with consequent failure to complete the testing, accounted for three subjects.

The study was planned for the eighth month of the school year, 1962-1963, and was placed late in the school year so that teachers might have the maximum time available in which to become thoroughly acquainted with the art production and attitudes of their students, and also so that students who were capable could have student work ready for the annual high-school art contest and exhibit which was held April 4 through 12, 1963.
Procedures Followed

As was indicated in Chapter I (see page 17), three steps were followed in collecting the data for this study; these involved (1) teacher judgments, (2) art contest jurying, and (3) administration of tests.

The four teachers in two senior-high schools whose students were to be used as subjects were asked to name those of their students (1) who were highly creative and (2) who exhibited little or no creative ability. Those students not nominated for either of the preceding groups were placed in the middle category. It was recognized that these groupings were broad and would not be finely discriminating.

What would appear to be an unusual procedure occurred next. Entries were selected for the annual high-school art contest of the city, and the jurying for the contest criterion of this study took place before actual testing of students was carried out. The reversal of what would be a more usual procedure was necessary because of the timing of the contest. If testing of students took place before the contest dates, it was believed that students would be deprived of time necessary for preparing contest entries. Also, since several students were enrolled in their first semester of high-school art, it was believed
that they should be given as much time as possible in which to be associated with the art-room atmosphere before testing was begun.

As the time drew near for the annual senior high-school art exhibit and contest sponsored by a large downtown bank and the Junior Chamber of Commerce, careful plans for student entries were prepared. Since this contest was to form a criterion group for the study at hand, the four art teachers involved each had the help of an outside, experienced art teacher who did not know personally the students involved in selection of the entries for the contest.

Contest rules (8) specified that work from 20 percent of the students enrolled in a class might be entered. This ruling was interpreted to mean that more than one piece of work from one student might be entered. Work available for entry was placed on tables, and the teacher of the students involved and the outside art teacher together selected entries to be submitted. Each teacher was asked to read and re-read the definitions of creativity and artistic creativity as spelled out for this study. It was agreed that choices should be completely acceptable to both teachers.

One unlooked-for fact which emerged from this selection was that a few students, regarded as highly creative,
did not have work available for entry in the contest; either their work was incomplete, or it had been carried away from the classroom. Some few students who appeared most capable of placing in the contest seemed not to care whether or not their work was entered. On the other hand, students judged less able by their teachers were upset to find that their work had not been entered. In an overall picture, probably some work was entered from the majority of the most capable students, yet the question of why some few students did not have entries ready cannot be answered. When student-art work was returned from the contest, a score was computed for each student on the basis of the ranking scale as presented in Chapter I (see page 19).

The last step in collecting data for this study was the administration of four tests of general creativity, ingenuity, artistic judgment, and artistic performance. The testing proceeded in a manner satisfactory to the teachers involved, all of whom felt that favorable testing occurred. Interest of students was high, interruptions were few, and stragglers were quickly processed. Students were helpful and enthusiastic about taking part in a research study.
Tests Selected and Opinions of the Tests

The following tests were selected for this study:

(1) Cree Questionnaire (2). This is a test of general creativeness designed to be used in a business setting for selecting certain types of personnel. It is not represented in any way to be suitable for senior high-school students by its originators, but it was chosen for this study because it was objectively scored, was based on careful theoretical positions, and the test manual presented a definite statement concerning its validity: "... over one third of these 145 items have Chi-square probabilities less than .05" (2, p. 7). Little information or comment was available on the Cree Questionnaire, which was copyrighted in 1959 by the Industrial Relations Center of the University of Chicago.

(2) Flanagan Aptitude Classification Tests, No. II, Ingenuity (5). These tests are for use with high-school students. They were published in 1953 and were developed by Air Force factor analyses. Cronbach made the following observation concerning the tests:

The validity of the tests is still under observation, and they should be restricted to research use at present. In particular, the "occupational scores" obtained by combining tests should not be used until satisfactory evidence of their validity is provided (3, p. 292).
Flanagan reported concurrent validity coefficients for Test 11—Ingenuity and criteria of originality in high-school art classes, using two schools with two grades (sophomore and senior) and two classes. He stated later in the same report:

To try to validate an Ingenuity test using ratings of the originality shown in writing short stories or in doing geometry problems seems fairly hopeless. In art the Ingenuity Test appears to give us a little better results.

... the question of the extent to which the unique variance in the Ingenuity test is valid and will predict ingenious or creative performance is something which has yet to be investigated adequately. The art data certainly looks more promising than the data for other fields, and for understandable reasons (4, p. 119).

(3) Graves Design Judgment Test (6). Probably the best known of available art tests, the Graves Test presents the most attractive format and means of presentation. Michael, reviewing the test for the Mental Measurements Yearbook, described it as

... a conscientious and noteworthy achievement in test construction within a field of extraordinary complexity and ambiguity ... the realization of a substantial degree of validity is almost an unattainable objective. Thus the major weakness of this test, as well as of others purporting to measure aesthetic judgment, is the theoretical one of establishing more or less universal criteria (principles) against which the test might be validated (1, p. 335).

A study made in 1960 by Mold (11) on the predictive validity of the Graves Design Judgment Test used 128
undergraduate elementary-education students as subjects. The test was assessed by comparing test scores with performance in criterion art products.

... although this test had been available for a decade, published information had not been sufficient to evaluate its usefulness.

Conclusions: The Graves Design Judgment Test has too slight validity in predicting performance in varied art tasks to be recommended as a measure of general art aptitude.

Wold (11) expressed himself as deploiring the "general tendency to over-simplify the evaluation of art talent."

(4) Lewerenz Originality of Line Drawing (9). This test, available since 1927, has been but little used. Only one test of several which comprise the entire group was chosen for this study. The entire test is purported to be suitable for use in grades two through twelve. Most of the tests appear outdated and dull, with the exception of the one-page Originality of Line Drawing (Part I, Test 2), which offered a somewhat different framework of dots into which a subject was asked to project his own drawing. Of the entire test, a conclusion by Cronbach would seem pertinent:

The components of artistic ability ... have not been adequately identified, and the tests now available are based only on some investigator's hunch as to what makes an artist. One such test is the Lewerenz Test of Fundamental Abilities in Visual Art (California Test Bureau).
Research on artistic abilities is still in a most primitive stage. No systematic research has been done using modern tests and adequate criteria. Most of the tests have been left as they were when first designed as much as thirty years ago, without follow-up research or revision. The nature of artistic aptitude remains an unsolved—and neglected—problem (3, p. 317).

With the exception of the Leverenz Originality of Line Drawing, all of the tests used for this study were scored objectively. Despite a carefully worked out (although rather outmoded) ranking system, the Leverenz test requires subjective judgments. Originally scored by the investigator of this study, it was later decided to use five independent rankings by experienced art teachers as well. All rankings correlated at better than .7 correlation, and the judgments originally made by the investigator were retained.

All scores were tabulated and key punched in I. B. M. cards for statistical computation.

Statistical Treatment of the Data

On the basis of teacher judgments of high-, middle-, and low-artistic creativity, a simple analysis of variance was computed for each of the four tests and for the art contest. Significant differences appeared in each case, indicating that an additional procedure was necessary to show where these differences occurred.
McNemar's statement that "after, and only after, it has been found that the over-all $F$ is significant can one safely use the $t$ technique to test the significance of the difference between any two of the group means" (10, p. 259), applied to the results of analysis of variance for this study.

Fisher's $t$ test was run for each test and the art contest between high-middle, middle-low, and high-low groups. Since the $t$ test permits of greater variability, it was decided that a level of significance of at least .001 would be necessary to conclude that the test met the requirements of this study. The necessary statistical assumptions of a normal population and equal distribution could be made for the entire study.

Summary

In an attempt to locate a test or tests already available, which would predict artistic creativity in senior-high school students, two older art tests, the Leweres Originality of Line Drawing (1927) and the Graves Design Judgment Test (1946), and two later but non-art tests, the Cree Questionnaire (1959) and the Flanagan Ingenuity Test (1958), were chosen to be used with a senior-high-school art population of 285 subjects. The
subject population represented the entire art enrollment of two large urban high schools.

This study used three broad categories of teacher judgments of students' artistic creativity as the framework in which test scores and a ranking obtained through an independently juried art contest were assessed.
CHAPTER BIBLIOGRAPHY


CHAPTER IV

ANALYSIS OF FINDINGS

An analysis of the data of this study was made to ascertain the degree and kind of relationship which might exist between (1) four tests of general creativity, ingenuity, artistic judgment, and artistic performance, (2) teacher judgments of artistic creativity in senior-high school, and (3) performance by students in an independently juried art contest. Results of these data were reported in terms of the hypotheses of the study. In order to draw conclusions for this study, two statistical treatments of the data were utilized; these were simple analysis of variance and t-test.

Simple analysis of variance was used first to determine if there actually was a difference between mean scores of the high-creative, middle-creative, and low-creative groups of students as determined by teacher judgments on each of the four tests administered and the independent art contest. It was decided that for the analysis of variance a significance level of .01 or better would be needed to conclude that any of the tests or the art contest met the requirements of the study.
The results of this statistical procedure are presented in Table I (see page 81), which shows an analysis of variance between teacher ratings of pupils' creativity, an independent art contest, and four tests of art judgment, art performance, ingenuity, and creativity.

An inspection of Table I indicates that results of all tests and of performance in the high-school art contest reached or exceeded required levels of significance, indicating that analysis of the data should be carried further. Table I shows that the art contest and three of the tests revealed a level of significance well beyond the .001 level and that the fourth test easily met the .01 requirement level and closely approached the .001 level achieved by the other tests and contest. An analysis of variance, while demonstrating that a difference between the means of the high-creative, middle-creative, and low-creative groups does actually exist, does not show between what groups that difference occurs. Thus, it was necessary to use a second statistical technique, the \( t \) test, in order to find where the relationships existed. These data are presented in Table II (see page 82).

Recalling the dictum presented in Chapter III (see page 76) that only after the over-all \( F \) has been found to be significant can one safely use the \( t \) technique to test the significance of the difference between any two of the
<table>
<thead>
<tr>
<th>Test</th>
<th>f</th>
<th>Between Groups</th>
<th></th>
<th>Within Groups</th>
<th>Totals</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sum of Squares</td>
<td>df</td>
<td>Var. Estim.</td>
<td>Sum of Squares</td>
<td>df</td>
</tr>
<tr>
<td><strong>Leverenz Drawing</strong></td>
<td>17.61</td>
<td>417111</td>
<td>2</td>
<td>20.86</td>
<td>339521</td>
<td>282</td>
</tr>
<tr>
<td><strong>Originality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Art Contest</td>
<td>14.65</td>
<td>473803</td>
<td>2</td>
<td>23.69</td>
<td>456114</td>
<td>282</td>
</tr>
<tr>
<td><strong>Flanagan Ingenuity</strong></td>
<td>10.39</td>
<td>4425680</td>
<td>2</td>
<td>221.28600884290</td>
<td>282</td>
<td>21.30</td>
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<tr>
<td><strong>Graves Design</strong></td>
<td>8.78</td>
<td>32070200</td>
<td>2</td>
<td>1603.518514827800</td>
<td>282</td>
<td>182.56</td>
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<tr>
<td><strong>Judgment</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cree Questionnaire</strong></td>
<td>6.61</td>
<td>2826100</td>
<td>2</td>
<td>1114.05602845000</td>
<td>282</td>
<td>213.77</td>
</tr>
</tbody>
</table>

*8.9 was required for .001.
TABLE II

RELATIONSHIPS OF HIGH-LOW, HIGH-MIDDLE, AND MIDDLE-LOW GROUPS ON FIVE TESTS AND AN ART CONTEST

<table>
<thead>
<tr>
<th>Groups*</th>
<th>T Scores</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lewerenz Drawing Originality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between high-low groups</td>
<td>5.5621</td>
<td>.001</td>
</tr>
<tr>
<td>Between high-middle groups</td>
<td>3.4103</td>
<td>.001</td>
</tr>
<tr>
<td>Between middle-low groups</td>
<td>4.0370</td>
<td>.001</td>
</tr>
<tr>
<td>Art Contest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between high-low groups</td>
<td>3.1518</td>
<td>.01</td>
</tr>
<tr>
<td>Between high-middle groups</td>
<td>4.6697</td>
<td>.001</td>
</tr>
<tr>
<td>Between middle-low groups</td>
<td>1.9449</td>
<td><em>...</em></td>
</tr>
<tr>
<td>Flanagan Ingenuity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between high-low groups</td>
<td>4.1533</td>
<td>.001</td>
</tr>
<tr>
<td>Between high-middle groups</td>
<td>1.4274</td>
<td>**</td>
</tr>
<tr>
<td>Between middle-low groups</td>
<td>3.3552</td>
<td>.001</td>
</tr>
<tr>
<td>Graves Design Judgment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between high-low groups</td>
<td>4.0254</td>
<td>.001</td>
</tr>
<tr>
<td>Between high-middle groups</td>
<td>2.0023</td>
<td>.05</td>
</tr>
<tr>
<td>Between middle-low groups</td>
<td>3.0953</td>
<td>.01</td>
</tr>
<tr>
<td>Cree Questionnaire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between high-low groups</td>
<td>3.1978</td>
<td>.01</td>
</tr>
<tr>
<td>Between high-middle groups</td>
<td>2.9390</td>
<td>.01</td>
</tr>
<tr>
<td>Between middle-low groups</td>
<td>1.4262</td>
<td>**</td>
</tr>
</tbody>
</table>

*Numbers: High group = 67  
Middle group = 171  
Low group = 47

**1.645 required for .1.
group means, and recognizing that the $t$-test permits greater variability, it was decided that a significance level of .001 would be required for $t$-test scores.

Hypotheses

For the purposes of this study five hypotheses were tested, with the results as shown below.

1. There are means by which it is possible to predict the artistic creativity of high-school art students. Teacher judgments of highly creative senior-high school art students named those students who also performed well in an independent art contest and on four tests of general creativity, ingenuity, artistic judgment, and artistic performance. Significance levels of .001 were reached on the Lewenz Drawing Originality, the Flanagan Ingenuity, and the Graves Design Judgment tests between high-creative and low-creative groups, and on an independent art contest between high and middle groups. This hypothesis is supported.

2. Teacher judgments of high-school art products are sufficient to formulate a satisfactory basis of judgment of artistic creativity in high-school art students. Since the art products judged to be highly creative by teachers showed a level of significance far beyond the .001 level of significance, this hypothesis is supported.
3. Teacher judgments of creativity in high-school art students are verified by the art products of these students within the framework of a comprehensive art contest open to all contest subjects. Although only half of the students judged to be highly creative by their teachers had work entered in a high-school art contest, the quality of the work was such that a level of significance well beyond the .001 level appeared in an analysis of the variance between teachers' ratings and contest performance. This hypothesis is supported.

4. Testing instruments used for ascertaining artistic creativity in high-school art students support teacher judgments of artistic creativity in these same students. On three tests, a level of significance of .001 between high and low creativity as judged by teachers was maintained; on one other test, a level of .01 between high and low creativity as estimated by teachers was maintained. This hypothesis is supported.

5. Teacher judgments, testing instrument results, and art-contest entry results are related. Since a level of significance of .001 was reached by art-contest entries and results of three of the tests used and since the level of significance for the results of the fourth test was far beyond the .01 level (very near the .001 level), this hypothesis is supported.
Means and standard deviations, together with the range of scores made by students in the testing and the highest score possible for each test, are presented in Table III (see page 86).

An analysis of Table III reveals that in the Lewerenz, the Flanagan, and the Graves tests there was much less spread between the means of the upper and the middle groups than between the middle and lower groups and that standard deviation was less in the Lewerenz and the Flanagan tests between the upper and middle groups.

Predictors of Artistic Creativity

Inspection of Tables I, II, and III reveals that all tests and the art contest used for this study showed acceptable significance levels in an analysis of variance between high-, middle-, and low-creative groups as judged by teachers.

Determining where these differences occurred, the t test showed the required significance of .001 between all groups on the Lewerenz Drawing Originality Test and between high-low groups and middle-low groups on the Flanagan Ingenuity Test. The Graves Design Judgment Test revealed the required .001 level only between high-low groups, and the Cree Questionnaire failed to reach the .001 level between any groups.
<table>
<thead>
<tr>
<th>Test</th>
<th>Group I High-Creative</th>
<th>Group II Middle-Creative</th>
<th>Group III Low-Creative</th>
<th>Range of Test Scores</th>
<th>Highest Score Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S. D.</td>
<td>Mean</td>
<td>S. D.</td>
<td>Mean</td>
</tr>
<tr>
<td>Lowenz Originality Drawing</td>
<td>2.37</td>
<td>1.26</td>
<td>2.32</td>
<td>1.04</td>
<td>1.64</td>
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<tr>
<td>Flanagan Ingenuity Test</td>
<td>14.52</td>
<td>4.63</td>
<td>13.60</td>
<td>4.42</td>
<td>10.66</td>
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<tr>
<td>Graves Design Judgment</td>
<td>63.03</td>
<td>13.22</td>
<td>59.22</td>
<td>13.13</td>
<td>52.30</td>
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<tr>
<td>Cree Questionnaire</td>
<td>66.66</td>
<td>15.77</td>
<td>60.51</td>
<td>13.90</td>
<td>57.17</td>
</tr>
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</table>
Table III reveals that, while on the Lewerenz, the Flanagan, and the Graves tests some subjects reached the highest score possible (or very near it), on the Cree test, the highest subject score made was far from the highest score possible. On the Graves and Cree tests the standard deviation spread in high, middle, and low groups was wide.

In terms of the purpose of this study, it appears that the Lewerenz Originality of Line Drawing Test and the Flanagan Ingenuity Test present the best combination for assessing visual creativity in senior high-school art students. If only one test could be used, the Lewerenz test appears to be the better choice. However, the two tests together seem to offer the best opportunity for a more complete and adequate picture. The Lewerenz test compels the student to perform; the Flanagan test compels him to think in order to arrive at the ingenious solution.

The Art Contest

Requiring a particular interpretation is the art contest for which all subject students were eligible but, in terms of the contest rules, from whom only 20 per cent could have work entered. Since it is reasonable to expect that these 20 per cent (57 students) would be highly creative, they could be expected to be in the high group.
In the total high group there were 67 students considered by their teachers to be highly creative. It has previously been reported that when the contest entries were being selected a small number of the students regarded as highly creative had no work available for entry in the contest. A recount of the original data showed that work of 33 students was entered in the contest—approximately half of the group regarded as highly creative by their teachers. It is true that several pieces of work were entered by each of the highly productive and interested students. Yet the fact remains that half of the students from whom their teachers might have expected productive art work failed to enter the contest.

These facts give rise to the question: Did the teachers view their students too generously, or is a motivational aspect of the students involved? In addition, a survey of the original data reveals that student work chosen to be entered in the contest, in a very few cases, came from students regarded by their teachers as middle or even low in creativity. No ready explanation for this fact is evident here.

Summary

This chapter, on the basis of test results and contest entry results, has indicated that the Leverenz Drawing
Originality Test and the Flanagan Ingenuity Test appear to be better suited for predicting artistic creativity in senior high-school students than do the two other tests used in this study.

Unexplained is the failure of students regarded as highly creative by their teachers and judged capable of placing in a high-school art contest to enter work for judging.

Teacher judgments have been shown to be reliable in selecting artistically creative senior high-school students who performed well on four tests and in an art contest. It was indicated that the high-school teachers may have tended to be too generous in their choices of highly creative students by naming as creative those students in whom they had seen creative process at work, rather than insisting that creative product was necessary for designation as "creative."

Chapter V presents conclusions, recommendations, and the summary for this study.
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study was concerned with the degree and kind of relationship that might exist between certain measures of creativity, ingenuity, art judgment, and art originality. A purpose of the study was to identify a test or tests of visual creativity which could be used to predict creativity in senior high-school students, both for screening purposes and for program planning and curriculum uses. An additional purpose was to discover possible implications for more sensitive test-making through the uncovering of areas which instruments used in this study failed to assess.

Research for art education in the high-school area was found to be negligible, the need for tests in this field acute, and research in the high-school area of art education long overdue.

With one notable exception, the limited research in art education has been based largely on individual needs and problems and does not represent a concerted, or even an organized, attack on the problems which confront art education. The exception noted is in art-education
research at Pennsylvania State University, where an organized approach, largely in identifying the components of creativity, has been carried out for approximately ten years. The art-education department of this university has produced highly specialized tests of artistic creativity largely for its own research uses; as yet it has not produced tests generally adapted to high-school use.

Meanwhile, the location or identification of tests already standardized and available for the use of high schools generally has seemed imperative. The difficulty of obtaining newer tests of creativity or of choosing among older ones apparently has prevented research and general studies in the schools.

Traditionally, the judgment of experienced teachers has been the only reliable means of identifying the creative art student; that identification could be made only after several months of communication between teacher and students within a setting conducive to artistic production.

For this study, students who had been previously judged by their teachers to be either high, middle, or low in artistic creative ability were administered four tests of art judgment, art performance, general creativity, and ingenuity, by naming as creative those students in whom they had seen creative process at work, rather than
insisting that creative product was necessary for designation as "creative." Teacher judgments of the students were sustained by performance of the students on the tests and also by an art contest, which was independently juried.

Conclusions

This study has attempted to apply a type of scientific measurement to artistic performance which does not readily lend itself to analysis. It must be recognized that the criteria used are less definitive than might be the case with materials more amenable to exactness in measurement.

In the light of data revealed and within the limitations of the study, the following conclusions seem justified:

1. This study revealed means by which it is possible to predict the artistic creativity of senior high-school students.

2. Teacher judgments were shown to be a sufficient basis for definition of artistic creativity in senior high-school students.

3. Teacher judgments were verified by the performance of students in an independent art contest.

4. Testing instruments supported teacher judgments of students.

5. Testing instruments supported art-contest appraisal of students entered in the contest.
6. Teacher judgments, testing instruments, and performance in art contest were shown to be significantly related.

7. Of those used in the study, two tests, Lewerenz Test of Originality of Line Drawing and Flanagan Ingenuity Test, were indicated as the best predictors of artistic creativity in senior high-school students; and it was recommended that they be used in conjunction with each other for the prediction of artistic creativity in senior high-school art students.

8. Three test instruments which were used for this study were significant at the .001 level in differentiating between high and low groups: Lewerenz Drawing Originality, Flanagan Ingenuity, and Graves Design Judgment tests. The Lewerenz Drawing Originality Test and the independent art contest also differentiated between high and middle groups at the .001 level. The Lewerenz Drawing Originality and Flanagan Ingenuity tests differentiated between middle and low groups at the .001 level of significance.

9. The Lewerenz test was revealed as the most effective single predictor of originality in art students and was recommended for use when only one test could be administered. This test yielded even more sensitive results than were shown by the independent art contest.
Recommendations

As a result of this study the following recommendations are made:

1. Research should be designed to reverse the procedure of this study. Students should be administered the recommended tests at the beginning of the term, the testing instruments left unscored and put aside until the end of the term when teacher judgments of high-, middle-, and low-artistic creativity should be made. Ideally, this would be done with several unrelated groups. Analysis of findings should be made in a form duplicating the present study.

2. In the light of implications from this study, teacher judgments should be investigated to determine such aspects as "halo effect" and student-personality influence in judgments. The apparent confusion of process and product in teachers' assessments needs study.

3. The data revealed suggest that the Lewin's Draw-
ing Originality Test might have additional possibilities as a projective device. The test, which requires drawings original to the student to be placed within a specific framework, might offer clues to the experienced counselor as to the mental states of students through the subject matter portrayed. Possibly while indicating creativity in mentally healthy students, it might provide therapy clues for students with emotional-adjustment problems.
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