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A Comparison of Certain Creativity and Personality Variables

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DEDICATION

To my husband, Milt, whose loving support and patience was of inestimable worth in helping me attain this goal.

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CHAPTER I

INTRODUCTION

In recent years, there has been a growing interest in the construct creativity. A tremendous amount of research in all facets of creativity has evolved from that interest. One area of creativity which has received major emphasis is the personal characteristics of the creative person. Attempts have been made to isolate and define personality factors which might express a commonality among creative individuals (Stein & Heinze, 1960; Givens, 1962). Special attention has been given to outlining the desirable characteristics of educators because observation has indicated that teachers who are creative themselves are most effective in stimulating creative growth in their classrooms (Scofield, 1960; Givens, 1962). Since education involves most of the school age population on a long-term basis, exposure to educators, creative or otherwise, is bound to have lasting effects. Therefore, it is of utmost importance that personality characteristics of educators be considered in light of the influence they may exert on the creative development of their student population.

Purpose of the Study

In examining the research related to creativity and its educational implications, one finds a dearth of studies directly related to personality variables of teachers. Suggestions for implementing creativity in the classroom abound (Gallagher, 1964; Massialas & Zevin, 1967). New methods, such as inquiry training, focus on the creative development of the individual, but there has been little consideration as to whether or not the teacher's personality will allow him to follow through on the myriad suggestions and outlines proposed by authorities in the field. Few investigations have been initiated to determine if there is a personality basis for differences between high creative and low creative teachers.

The purpose of the present study was to make a comparison of personality variables with creativity scores for a group of 60 educators to determine if there are any personality factors significantly different between the high creative or low creative subjects. Two instruments were used: the Minnesota Multiphasic Personality Inventory and the Torrance Tests of Creative Thinking, Verbal, Form A. The statistical data obtained from these comparisons will reveal if there is or is not a significant difference between personality factors and scores on creativity as measured by these tests.

Hypotheses of the Study

The null hypothesis of no significant difference between the scores obtained by the high creative and low creative groups on each scale of the Minnesota Multiphasic Personality Inventory is postulated.

The null hypothesis of no significant difference between the scores obtained by the high creative and low creative groups on the "neurotic triad" as defined by the Minnesota Multiphasic Personality Inventory is postulated.

The null hypothesis of no significant difference between the scores obtained by the high creative and low creative groups on the "psychotic tetrad" as defined by the Minnesota Multiphasic Personality Inventory is postulated.

Terms Used in the Study

The following terms need defining within the scope of this study:

Creativity

For the purposes of this study, creativity has been defined as a score on the Verbal section of the Torrance Tests of Creative Thinking.

Variables

The term refers to the varying personality and creativity traits as measured by the instruments used in the study.

High Creative

The term is used to designate the top 30 per cent of those subjects taking the Verbal section, Form A, of the Torrance Tests of Creative Thinking.

Low Creative

The term is used to designate the lower 30 per cent of those subjects taking the Verbal section, Form A, of the Torrance Tests of Creative Thinking.

Educators

The term is used to include anyone professionally involved in education.

Neurotic Triad

The term is used to describe a pattern on the MMPI which indicates neuroticism. The first three clinical scales in varying positions compose the triad (Dahlstrom & Welsh, 1960).

Psychotic Tetrad

The term is used for a closely related designation of patterns and relationships among the psychotic scales on the MMPI. This includes scales 6, 7, 8, and 9 (Dahlstrom &Welsh, 1960).

Related Research

A review of the literature has indicated a growing interest in isolating and identifying a personality constellation unique to creative individuals. Though some studies have shown interesting results, the evidence for identifying creative individuals and the degree of their creativity through personality traits is still in the neophyte stage. The relationships with other people and their effect in nurturing, ignoring, or inhibiting creative behavior has also been given some attention as a factor in the personality development of the individual. Because of this trend and because of their involvement on a long-term basis with children, teachers are coming under scrutiny as to the part they play in this complex situation. This research attempted to determine if there were any personality characteristics common to low creative or high creative educators as measured by the instruments used in the study.

According to Taylor (1966), creative individuals tend to have certain characteristics in common, although no one single trait is sufficient to account for very much of creative behavior. He feels that the following are helpful in delineating creatives from non-creatives: general characteristics are being self-sufficient, independent, venturesome, and possessing a life history which encouraged creative responses; intellectual characteristics include originality and imagination, ability to be puzzled and to sense problems, various fluencies and flexibilities, resourcefulness, innovativeness, elaboration, and great inner resources;

and, finally, motivational characteristics such as intellectual persistency, liking to think and toy with ideas, deep involvement in work, preference for complexity and the challenges therein, resistance to leaping to conclusions prematurely, willingness to be intuitive and to work at the level of hunches, need for variety, need to revise things, need for mastery, and toleration of uncertainty.

Blatt (1957) used ratings obtained from associated personnel and colleagues to divide a group of seventeen PhD industrial research chemists into "more" creative and "less" creative groups. His results indicated that the eight "more" creative chemists were "more autonomous, striving, and devoted" than their colleagues and also had "higher economic and aesthetic values and lower social, religious, and authoritarian values." The more creative group "saw their attitudes as more different from others" than did the less creative men. The more creative group showed greater efficiency in problem-solving, also.

In a study of high creative and low creative junior college students, Gumeson (1963) found some statistically significant differences. From a population of 136 students, he selected 68 subjects: 17 males, high creative; 17 males, low creative; 17 females, high creative; and 17 females, low creative. As a group, the high creatives were discerned as more autonomous, verbally adept, dominant, aesthetically oriented, and achieved higher grade point averages.

Using Cattell's Sixteen Personality Factor Questionnaire and other instruments, Drevdahl (1956) employed a population of undergraduates and graduate students at the University of Nebraska to compare personality characteristics, intelligence, and creativity ratings. The students were in the science and arts departments and were nominated as being highly creative by faculty members in their area. According to Drevdahl, the "creative groups scored higher than the non-creative group in the factors of radicalism vs. conservatism, and self-sufficiency vs. lack of resolution; and lower on the factors of cyclothymic vs. schizothymic, and surgency vs. desurgency." In examining the overall results, Drevdahl came to the following conclusions:

> Creative persons are superior in verbal facility, fluency, flexibility, and originality.
>
> Creative persons are more withdrawn and quiescent. Creative artists are somewhat more radical and self-sufficient than creative scientists or non-creatives.
>
> The art group are more sensitive emotionally, more bohemian.
>
> Individuality or non-conformity appear to be desirable for creativity (Drevdahl, 1956, p. 26).

Drevdahl, in association with Cattell (1958), did further research in this area, but chose established artists to test. They analyzed 153 creative artists and writers and found that they differed from the normal population in being "more intelligent, emotionally more mature (ego strength), dominant, adventurous, emotionally sensitive, bohemian, radical, self-sufficient, and of a higher ergic-tension."

It was also confirmed that creative individuals may hold themselves above customary social conventions: "Conformity, concern for propriety, adherence to social standards and dictates are somewhat lacking in our experimental population" (Drevdahl & Cattell, 1958, p. 109).

Rees and Goldman (1961) investigated the relationship between creativity and personality factors using two objective personality tests: the Minnesota Multiphasic Personality Inventory and the Guilford-Zimmerman Temperament Survey. The subjects were 68 students at the University of Kansas City who were differentiated into three matched groups on the basis of degree of creativity as determined by their scores on a questionnaire developed by the authors. There were no significant differences found until the uppermost portion of the highly creative group was compared to the low creative group. The results obtained then showed that the most creative group scored significantly lower on the factor of Restraint and Friendliness, and higher on Ascendance on the GZTS personality test. On the MMPI, the most creative group was significantly elevated on the Hysteria scale. The investigators inferred from these results that the "most creative individuals in the experimental population, as compared to the least creative, are characterized by more impulsiveness, and lack of restraint. They also tend to be more aggressive, domineering, and ascendant" (Rees & Goldman, 1961, p. 159).

Data on their personality profiles through the use of Cattell's Sixteen Personality Factor Questionnaire was obtained for 96 biologists,

91 physicists, and 107 psychologists. Each individual was categorized as a researcher, teacher, or administrator by a committee of professionals in his respective discipline. In a comparison of the scientists with the general population, the scientists were described as more dominant, more intelligent, less surgent, more sensitive, more adventuresome, and more lacking in paranoid trends and free-floating anxiety. Also, they possessed more ego strength, or stability; they adopted less standard moral goals; and they had more "will control," in the sense of "strict internalized and intellectualized standards, and exacting demands on the self." Compared to teachers or administrators, the scientists were found to be more schizothyme, emotionally unstable, bohemianly unconcerned, self-sufficient, and radical. They were also significantly, but less uniformly, more dominant, withdrawn, schizothyme, paranoid, and lower in compulsive super-ego (will control). In the last and in radicalism, they differed more from administrators than from teachers. Only administrators differed from the others in showing less somatic anxiety (Cattell & Drevdahl, 1960, as cited in Stein & Heinze, 1960).

An extensive study was implemented by Barron (1957) to determine the relationships between a measure of originality and the other personal and intellectual characteristics of the individual and to determine the correlates of originality when the effects of intelligence were controlled for. In the first phase of the study, the sample included 100 Air Force captains who were tested for originality. The 25 at each

end of the continuum were compared with the following results: the high scorers were found to be "intelligent, widely informed, concerned with basic problems, clever and imaginative, socially effective and personally dominant, verbally fluent and possessed of initiative"; low scorers were found to be "conforming, rigid and stereotyped, uninsightful, commonplace, apathetic and dull" (Barron, 1957).

In the second phase of the experimental study, a sample of 343 Air Force captains were tested to obtain two groups designated high original-low intelligence and high intelligence-low original respectively. There were fifteen in the first group and twenty-three in the second. Using an adjective check list, the authors found that these adjectives were applied more for the first group: "affected, aggressive, demanding, dependent, dominant, forceful, impatient, initiative, outspoken, sarcastic, strong, suggestible." For the second group adjectives included: "mild, optimistic, pleasant, quiet, unselfish" (Barron, 1957). From the results of this study, the author made the following suggestion:

> . . . primary process thinking to the exclusion of the secondary process marks the original but unintelligent person, secondary process thinking which carries ego-control to the point where the ego is not so much strong as muscle-bound marks the intelligent but unoriginal person, and easy accessibility of both primary process and secondary process marks the person who is both original and intelligent (Barron, 1957, p. 739).

Teachers, as a group, have undergone little investigation for creative ability. Evidence has largely been in the form of descriptive word pictures of creative teachers encountered by interested researchers.

Torrance (1962) picks out a core of commonality in three such studies of creative teachers. They all are described as highly sensitive, flexible, resourceful, and willing to "get off the beaten track." They show uniqueness and diversity and have the capacity to form good relationships with their creative students. Creative teachers are pictured as more likely to attempt difficult tasks which may result in failure. They may show some eccentricities, be nonconforming, and seem at times to be childish. They are not so concerned with social conventions related to courtesies and may appear primitive, naive, and unsophisticated at times. Their absorption in helping children develop may lessen their sociability with others. They are frequently rather shy and somewhat withdrawn and quiet. At certain times and in certain situations they may exhibit haughtiness, self-satisfaction, discontentedness, fault-finding, and independence of thinking.

Authorities in the field of creativity have experienced more success in projecting the personality traits they would like to see in the teacher who would encourage creative growth. Gold (1965) reports that Carlson (1960) and Torrance (1960) describe this person as being a fully functioning, self-actualizing individual. He should exhibit traits of sensitivity, flexibility, resourcefulness, and be willing to accept divergent thinking. His self-concept must necessarily be positive so he can relate constructively to others and so that he does not see the unusual student as a threat. To develop sensitivity and

intuitive perception in his students, the teacher must demonstrate the openness to experience he is trying to foster in others. To participate in the creative discourse of his gifted students, the teacher must also share their theoretical and aesthetic orientations. In essence, according to Rasey (1956), there appears to be need for the role of the teacher to change from one of "imparter of knowledge" to that of "creator." Her image of the teacher is that of a stage manager and scene shifter leading the child into areas rich in experience.

Though authorities in the field have stressed the importance of the role of the teacher in promoting creative growth in the classroom, there has been little supportive data available for this contention. The complexity of the problem and the difficulties involved in controlling all the variables have formed an obstacle most researchers don't care to surmount. Foremost among the few studies that have been attempted is one by Yamamoto (1962), an associate of E. Paul Torrance. Torrance analyzed some of the data collected by Yamamoto in his testing manual (Torrance, 1966). The subjects consisted of 19 fifth grade teachers and all of the fifth graders in the same school system. The teachers took a creativity test as well as a test that measured their tolerance for complexity and theoretical orientation. The children were administered achievement, intelligence, and creativity tests. After five months, the students were again given achievement tests. In examining the results, Torrance chose two teachers to amplify his findings. Teacher A scored

as one of the lowest on creativity, tolerance for complexity, and theoretical orientation. In her class, six of the seven children designated as highly creative underachieved and eleven of the twelve less creative children overachieved. Teacher B was one of the high scorers on the tests of creativity, tolerance for complexity, and theoretical orientation. All four of the highly creative children in her room overachieved; ten of her low creatives also qualified as overachievers. Torrance explains these differences by the emotional environment provided by these two different personalities. This analysis would be more meaningful had all the teachers and students been employed and a statistical treatment given to the research.

A study of changes in teacher behavior and its effect on stimulating creative growth in students was carried out by Enochs (1964). Four fifth grade teachers and their 97 pupils composed the subjects involved in the study. Two teachers were given audio-video replay of the classroom behavior and were verbally reinforced for allowing the students to do more of the talking during the class session and for listening to and accepting what the pupils were saying. The emphasis was on a permissive classroom atmosphere in the sense that pupils could feel free to express their ideas (Enoch, 1964). It was found that as the experiment progressed, those teachers receiving audio-video playback became more and more accepting of pupils' ideas while the control teachers did not. The pupils of the accepting teachers showed

greater gains on the Torrance Tests of Creative Thinking, particularly on originality, than those pupils of the control teachers (Torrance, 1966).

Creativity and individuality are currently of great concern to our society. The school, as one of society's institutions, is reflecting this concern in its efforts to design and implement programs to foster creativity in children. Inevitably, in any new order, roles must change with the times. The concept of the teacher's role has been affected by these changes, perhaps more than any other position in the hierarchy of education. In hiring teaching personnel, lip service, anyway, is paid to the importance of the so-called creative teacher and the superior attributes he may possess. It is of particular concern to establish if high creative and low creative teachers do indeed show differences in personality traits.

CHAPTER II

METHOD

The subjects of this study were 60 educators enrolled in Education 570. This is a graduate course required for a master's degree in education, which indicates that those enrolled plan to earn the higher degree. The course was taught during the 1968 summer session at Central Washington State College, Ellensburg, Washington.

Instruments

The instruments used in the study were selected after reviewing the Buros Sixth Mental Measurements Yearbook and several other sources on testing creativity and personality variables. The review of the literature indicated that the Minnesota Multiphasic Personality Inventory (MMPI) was one of the better known and researched personality tests of the non-projective type. The Torrance Tests of Creative Thinking were still in the research edition. This instrument had been used most successfully by its author, a recognized authority in the field of creativity, and was selected on that basis.

The Minnesota Multiphasic Personality Inventory was developed by S. R. Hathaway and J. C. McKinley at the University of Minnesota and was first made available in 1943. The inventory consists of 550

brief statements of personal experiences, feelings, and attitudes. The breadth of coverage includes the subject's family relationships, general health, phobias, morale, masculinity-feminity, bodily functions, occupational and educational experiences, habits, illusions, affective and compulsive states, dissimulation tendencies, sexual, religious, political and general social attitudes (Ball, 1962). The items used were selected for their ability to discriminate between "normals" and criterion groups of clinically diagnosed abnormals exhibiting relatively "pure" psychiatric syndromes (Carkhuff & others, 1965).

The items on this instrument fall into one of the following 10 scales: (1) Hs--Hypochondriasis; (2) D--Depression; (3) Hy--Hysteria; (4) Pd--Psychopathic Deviate; (5) Mf--Masculinity-Femininity; (6) Pa--Paranoid; (7) Pt--Psychasthenia; (8) Sc--Schizophrenia; (9) Ma--Hypomania; and (0) Si--Social Introversion. In addition, three correction or control keys (?, L, F) "are used to identify protocols made invalid by evasiveness, carelessness, or faking to produce either 'good' or 'bad' responses" (Getzels, as quoted in Gage, 1963). The "K" scale was developed to correct dissimulation but has assumed greater importance as a measure of ego strength and general adjustment (Barron, 1953).

The Torrance Tests of Creative Thinking were developed by Dr. E. Paul Torrance and his associates at the University of Minnesota. After approximately nine years of sustained research and development, the research edition was released for more general use in 1966. To use

these tests effectively, one must accept Torrance's definition of creativity as it provided the basis for the creative tasks developed. Torrance sees creativity as

> . . . a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on: identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses about the deficiencies; testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results (Torrance, 1966, p. 6).

Torrance justifies this approach to defining creativity by citing the following reasons. He feels it describes a natural human process with strong human needs involved at each stage. Incompleteness or disharmony arouses tension which we must resolve by investigating, diagnosing, manipulating, and making guesses and estimates to bring about a solution. Our guesses or hypotheses must be tested, modified, and retested; then we must tell somebody of our discovery before our tension is relieved. Other justification for this definition is that it allows one to begin defining operationally the kinds of abilities, mental functioning, and personality characteristics that promote or inhibit the process. Torrance feels it "provides an approach for specifying the kinds of products that result from the process, the kinds of persons who can engage most successfully in the process, and the conditions that facilitate the process." He also emphasizes its applicability to artistic, scientific, literary, dramatic, and interpersonal creativity and its harmony with historical usage.

The Torrance Tests of Creative Thinking were designed for use from kindergarten through graduate school. Within the context of the definition of creativity used by Torrance, tasks were chosen which met two criteria: those which could be the most easily and economically administered and scored, and those which stood best the tests of reliability and validity while at the same time sampling as many different kinds of manifestations of creative thinking ability as possible. The activities on the Verbal test, Form A, include the following: asking questions about a drawing, making guesses about the causes of the event pictured, making guesses about the possible consequence of the event, producing ideas for improving a toy so that it will be more fun to play with, thinking of unusual uses of cardboard boxes, asking provocative questions about cardboard boxes, and thinking of the varied possible ramifications of an improbable event.

In assessing the reliability of his battery of creative thinking tasks, Torrance (1966) suggests that a number of variables must be taken under consideration. First, almost all theories of creative functioning place great emphasis on the importance of emotional factors, bodily states, group atmosphere, etc. Certain psychological states are necessary for the production of fundamentally new ideas. Such states include involvement-detachment, deferment of judgment, speculation, playfulness, and the like. The time factor also plays an important part in test reliability. For example, children who have

experiences which enable them to learn in creative ways develop differently from those whose creativity is stifled by an atmosphere which discourages creative growth. Some teachers may favor some kinds of creative development over others. Children, therefore, cannot be expected to develop at the same rate even within themselves. The factor of motivation plays a very important part in assessing reliability according to Torrance. Creative thinking requires expensive energy, and the more expensive energy utilized, the more important the motivational factors. Torrance stresses the aforementioned variables to warn that although the test-retest reliability may be low, this does not necessarily make the instrument unreliable or lacking in usefulness.

Little has been done in testing the test-retest reliability with all four of Torrance's complete batteries. Only two studies were given as meeting this criteria of using alternate forms. The first study included 118 fourth, fifth, and sixth grade children in St. Croix, Wisconsin; the second study involved 54 fifth graders in White Bear, a St. Paul, Minnesota suburban school. The latter group was subdivided into 28 Experimentals and 26 Controls. The alternate forms of both the verbal and figural tests were administered to the first two groups one to two weeks apart and to the third group, eight months apart. The reliability coefficients for the verbal tasks only are presented here as they are apropos to this study. The three measures were Verbal Fluency, Verbal Flexibility, and Verbal Originality. The Wisconsin

group had coefficients of .93, .84, and .88 respectively. The Minnesota experimental group had correlations of .87, .84, and .79 in the same order. The control group, which had the longest time lapse, scored .79, .61, and .73 (Torrance, 1966).

An experiment to determine the scoring reliability of untrained personnel was conducted in 1965-66 by Torrance (1966). Six participating teachers and two educational secretaries were given a copy of the scoring guide and a set of completed test booklets to score. The mean coefficients of correlation for the Verbal form of the test in this study were: Fluency, .96; Flexibility, .94; Originality, .85; and Elaboration, .90. Torrance feels the single most important factor in low interscorer reliability is failure to read the scoring guide carefully and accept and apply its criteria. He suggests that increased reliability of scoring can be attained by setting up a training program in which scoring rationales are discussed, practice is provided in applying the guides, and there are opportunities to examine and discuss scoring differences of single sets of responses.

A test's validity is often defined as the extent to which the test measures what it purports to measure (Noll, 1957). Torrance (1966) stresses the impossibility of providing all research workers and potential users of tests of creative thinking with high coefficients of validity. The myriad definitions attached to the construct, creativity, and the infinite number of ways one can behave creatively defy provision

of an overall measure of validity. Torrance determines validity for his tests within the conceptualization provided by his definition. He feels that one can then consider process, product quantity and quality, personality characteristics, group dynamic variables, and other environmental factors that promote or impede the type of functioning described by the process definition.

In checking content validity, one should be aware of the limitations of the present tests of creative thinking. Torrance (1966) does not feel that "anyone can begin to specify the number and range of test tasks necessary to give a complete or even an adequate assessment of a person's potentialities for creative behavior." In attempting to attain as high a content validity as possible under the existing conditions, Torrance has made a consistent and deliberate effort to base the test stimuli, the test tasks, instructions, and scoring procedures on the most up-to-date theories and research presently available. Test tasks have been designed which are free of technical or subject matter content. In selecting test tasks, Torrance researched and analyzed the lives and personality characteristics of eminent creative individuals, the nature of performances regarded as creative, and research and theory concerning the functioning of the human mind.

Downie (1967) defines studies of construct validity as basically attempts to evaluate the theory underlying the test. They are useful in inferring "the extent to which a subject possesses some theoretical trait

or construct assumed to be reflected by performance on the test" (Downie, 1967, p. 92). A study was conducted by Weisberg and Springer (1961), in which the personalities of 32 intellectually gifted fourth grade children were studied in depth. The personality characteristics of the highly creative children were compared with those of the low creative children using several techniques. Results showed the highly creative children were rated significantly higher on: "strength of self-image, ease of early recall, humor, availability of Oedipal anxiety, and uneven ego development." The results of a projective personality test showed the creative students to be more sensitive and more independent than less creative but equally intelligent children (Weisberg & Springer, 1961, as given by Torrance, 1966).

Concurrent validity is "determined by correlating test scores with some other measurement of the same ability that the test was designed to measure" (Smith & Adams, 1966, p. 64). For example, Nelson (1963) compiled a list of personality characteristics of creative persons from a review of relevant literature. These were made into Q sorts to establish weights by a panel of judges. The checklists containing these characteristics were then used in obtaining from teachers descriptions of the outstanding characteristics of each child. When the scores of the upper and lower 27 per cent of each grade level were compared, all the verbal measures on the creativity tests differentiated the two groups at better than the .01 level. On the figural measures,

only originality and elaboration were discriminating at better than the .05 level (Nelson, 1963, as given by Torrance, 1966).

Because of the time lapse necessary for substantiating predictive validity, there is little to go on at this point in evaluating the Torrance Tests of Creative Thinking. The author, his associates, and other research workers are involved in on-going studies and are planning others for the near future. Data as to the results of these studies should be forthcoming soon (Torrance, 1966).

Procedures Used in the Study

The two instruments, the Minnesota Multiphasic Personality Inventory and the Torrance Tests of Creative Thinking, Verbal, Form A, were administered to the testing sample consisting of 60 educators enrolled in Education 570 during the 1968 summer session at Central Washington State College, Ellensburg, Washington. The Torrance Tests of Creative Thinking were sent to New York to be scored by trained personnel, as it was felt that this would increase the reliability of the results obtained. The MMPI's were handscored and a profile plotted for each individual. Thirty per cent of the educators at each end of the continuum on the Torrance Tests of Creative Thinking were designated as high creative and low creative, respectively. Comparisons were made between the two groups on all the MMPI scales using the *t* test for significance.

CHAPTER III

RESULTS

The null hypothesis of no significant differences between the high creative and low creative groups on the scales of the MMPI was upheld. The null hypotheses of no significant differences between the high creative and low creative groups on the "neurotic triad" and the "psychotic tetrad" were also upheld.

The sample was reduced by taking the top six high creative subjects and the bottom six low creative subjects. The *t* test for significance was used and a significant difference was found on Hs or the Hypochondriasis Scale. A comparison of the high creative scores (Mean = 14.00, Standard Deviation = 1.79) and the low creative scores (Mean = 10.83, Standard Deviation = 2.79) showed a *t* value of 2.34 which differentiated them at the .05 level of confidence.

A comparison by sex on the original sample revealed that the high creative males (N = 9) and the low creative males (N = 10) showed no significant differences on the personality traits measured by the MMPI. The high creative females (N = 9) and the low creative females (N = 8) showed differences on two scales at the .05 level of confidence. On the Depression Scale, a comparison of scores of the high creative females

(Mean = 18.40, Standard Deviation = 3.17) and the low creative females (Mean = 23.63, Standard Deviation = 4.96) had a *t* value of -2.59. A comparison of the scores of the high creative females (Mean = 18.90, Standard Deviation = 4.79) and low creative females (Mean = 23.25, Standard Deviation = 3.54) had a *t* value of -2.21 on the Hy or Hysteria Scale.

CHAPTER IV

DISCUSSION

A comparative study was conducted on two groups of teachers, designated as high creative and low creative on the basis of testing, to determine if they would demonstrate any significant differences on the individual scales of a nonprojective personality test as well as on the "neurotic triad" and "psychotic tetrad." The two instruments used in this study were the Minnesota Multiphasic Personality Inventory and the Torrance Tests of Creative Thinking, Verbal, Form A. The subjects were enrolled in Education 570, which is a required course for those pursuing a master's degree in education.

Thirteen individual scales of the Minnesota Multiphasic Personality Inventory as well as two significant combinations were employed in an attempt to differentiate the high creative group from the low creative group. In the comparison of the original two groups, the statistical analysis made on the data obtained from these 15 variables revealed no significant differences between them. Therefore, the null hypotheses were upheld. Of special interest, however, was the fact that on every scale except Masculinity-femininity and Hypomania, the low creatives received non-significant but higher scores than the high creatives. This

is in direct opposition to Rees and Goldman (1961) in which their most creative group consistently received higher scores on all of the scales. To attempt to find some significant differences, their lead was followed in breaking the sample groups down to smaller numbers. The top six of the high creative teachers were compared with the bottom six low creative teachers on the scales and combinations of scales described above. There was a significant difference on Hs or the Hypochondriasis Scale with the high creatives showing a higher mean. The t value of 2.34 differentiated the two groups at the .05 level of confidence.

The Hypochondriasis Scale measures the amount of abnormal concern with bodily functions. An elevation of this scale usually is found with people who are unduly worried about their health. The disorders they may complain about are without any clear-cut organic basis and are difficult to identify. The item content for determining scores on this scale include generalized aches and pains; specific complaints about breathing, thinking, vision, digestion, and sleep; peculiar sensations; and general health. According to the manual, it is characteristic of the hypochondriac that he "is immature in his approach to adult problems, tending to fail to respond with adequate insight" (Carkhuff & others, 1965; Hathaway & McKinley, 1951). Though a significant difference was found on this scale, an examination of the mean scores for both the high creative and low creative groups shows that their scores are well within the normal limits and therefore, this finding is of little value in differentiating personality traits on this scale.

In a comparison of high creatives with low creatives on the basis of sex, it was found that high creative males did not differ significantly from low creative males. A similar comparison with females, however, revealed a significant difference on two scales to the .05 level of confidence with the low creative females obtaining the higher scores. The two scales in question were the Depression Scale and the Hysteria Scale.

The Depression Scale measures feelings of uselessness and inability to assume normal optimism with regard to the future. These emotional feelings assess poor morale on the part of the individual. High scores generally indicate a person characterized by a lack of self-confidence, tendency to worry, narrowness of interests, and introversion. The item content for determining adjustment or maladjustment on this scale includes questions which plumb lack of interest, apathy, rejection of base impulses, denial of happiness or personal worth, inability to work, and inability to control thoughts (Carkhuff & others, 1965; Hathaway & McKinley, 1951).

Though the findings were significant in discriminating between the high creative females and low creative females, both means fell within the normal range and thus would have little meaning in assessing personality differences.

The Hysteria Scale is a measure of tendencies on the part of individuals to develop conversion-type hysteria symptoms. Those

people measuring high on the scale often complain of gastric or intestinal disorders, weakness, fainting, contractures (writer's cramp), paralyses, and cardiac symptoms. They sometimes have a real physical pathology as a result of a concurrent disease, or secondarily, as the result of psychological factors such as tension-caused ulcers. Though definite symptoms may never develop in some individuals with high scores, increased stress may cause them to react in a hysterical manner and solve the problems confronting them by the development of such symptoms. The item content for determining the adjustment of the individual on this scale includes questions which pick up somatic concerns such as specific bodily reference; tensions, fears, and worries; denials of inadequacies and base impulses; social concerns including protests against other people. The typical factors discerned through this analysis include poor health, cynicism, shyness, headaches, and neuroticism (Carkhuff & others, 1965; Hathaway & McKinley, 1951). As before, though a significant difference was obtained between the high creative females and the low creative females, the means obtained were well within the limits of normal adjustment.

The efforts of the present study have been directed toward showing if there is any significant difference between high creatives and low creatives on certain personality variables. No significant differences were found when using the original sample. The breakdown of the original groups into smaller samples at the furthermost points of

a creativity continuum resulted in a significant difference on only one personality trait. The size of the sample precludes making any generalizations about this difference or the differences encountered between the female high creatives and female low creatives, particularly since all means of the foregoing scores were well within the normal limits. Creative individuals are considered to have a common core of personality characteristics as are those individuals who are not creative. If this is to be conclusively established, more effective tests to discriminate personality variables will have to be devised.

Research Implications

There have been many attempts to determine the personality characteristics basic to the creative person. Some studies have revealed common traits in specialized people such as scientists and artists, but much of the knowledge of personality-creativity relationships is based on subjective observations of past and present individuals considered creative according to the criterion selected by the observer. When the research is examined for information on personal traits of educators, there is very little evidence available from which to draw conclusions. Claims as to the beneficial effect creative teachers have on the creative growth of their students have little data to substantiate them. Studies similar to this one might be done with larger samples. It would be very interesting to follow up the teachers in this study by testing the children in their respective classrooms near the end of the next school year to

determine if a creative teacher does make a difference in the creative development of children.

Educational research is being more and more directed to the teacher and the increasingly complex role he is being forced to assume in his vocation. An understanding of the personality characteristics of effective, as well as creative, teachers is of importance if a quality educational program is expected. However, until better instruments are designed to measure these personality traits, there is little value in attempting to screen teachers by them.

CHAPTER V

SUMMARY

It was concluded in the present study that there were no areas of significant difference between the high creative group and the low creative group in regard to the variables measured by the nonprojective personality test. The two instruments used to obtain the data were the Minnesota Multiphasic Personality Inventory and the Torrance Tests of Creative Thinking, Verbal, Form A. The tests were administered to 60 educators enrolled in Education 570, a course required for those pursuing the master's degree in education.

The raw data was gathered for each of the scales of the MMPI as well as the combinations which represent neurotic and psychotic tendencies, and comparisons were made with the top 30 per cent and the bottom 30 per cent of those teachers taking the creativity test. The data was analyzed by means of the t test to find if there was any significance. There were no significant differences until the sample was reduced to the top six individuals and the bottom six individuals at each end of the creativity continuum. The high creatives were found to be significantly higher at the .05 level on the Hypochondriasis Scale. A breakdown of the subjects by sex showed no significant differences

between high creative males and low creative males. However, the low creative females were significantly higher to the .05 level of confidence on both the Depression and Hysteria Scales. Though significant differences were found, they were of little value in differentiating personality characteristics as all means fell within the normal range.

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APPENDIX

APPENDIX A

TORRANCE TESTS OF CREATIVE THINKING, VERBAL

RAW SCORES

Rank	Verbal Fluency	Verbal Flexibility	Verbal Originality	Composite
1	137	56	111	304
2	170	61	57	288
3	151	57	79	287
4	159	53	50	262
5	156	58	22	236
6	125	47	64	236
7	124	60	40	224
8	111	53	60	224
9	105	44	52	201
10	96	50	52	198
11	109	47	42	198
12	110	50	37	197
13	132	44	21	197
14	142	44	28	196
15	101	47	47	195
16	95	43	55	191
17	86	37	68	191
18	93	49	48	190
19	108	45	30	183
20	105	47	29	181
21	85	38	55	178
22	86	42	50	178
23	79	40	58	177
24	104	48	25	177
25	82	43	49	174
26	88	46	37	171
27	83	38	49	170
28	79	36	54	169
29	97	38	33	168
30	105	44	17	166

APPENDIX A (continued)

Rank	Verbal Fluency	Verbal Flexibility	Verbal Originality	Composite
31	83	42	41	166
32	86	45	34	165
33	86	40	39	165
34	66	33	62	161
35	95	43	22	160
36	80	33	43	165
37	79	45	28	152
38	79	44	28	151
39	80	36	34	150
40	70	41	38	149
41	95	30	23	148
42	66	35	45	146
43	63	35	48	146
44	69	41	32	142
45	73	41	25	138
46	84	41	11	136
47	71	37	25	133
48	68	33	31	132
49	77	40	13	130
50	62	36	27	125
51	65	32	27	124
52	69	34	21	124
53	67	38	17	122
54	53	33	26	112
55	56	35	13	104
56	60	32	11	103
57	45	29	16	90
58	60	28	2	90
59	43	25	20	88
60	40	20	15	75

APPENDIX B

MINNESOTA MULTIPHASIC PERSONALITY INVENTORY

RAW SCORES

Rank	L	F	K	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si	N	P
1	2	6	16	13	20	18	24	37	2	31	23	27	24	51	83
2	1	12	12	13	20	23	21	35	6	31	28	14	32	56	79
3	2	3	11	14	24	18	19	33	7	24	25	15	34	56	71
4	0	1	9	15	20	18	18	39	9	26	21	19	23	53	75
5	2	3	18	17	24	26	24	38	10	28	24	18	23	67	80
6	8	3	22	12	19	25	19	26	10	24	23	21	14	56	78
7	4	2	14	9	20	21	22	46	13	28	25	24	25	50	90
8	1	4	14	10	16	19	20	41	7	28	28	26	23	45	89
9	4	7	14	11	20	17	22	43	10	28	23	22	23	48	83
10	1	8	9	5	19	9	19	45	7	29	30	26	32	33	92
11	5	1	10	8	19	15	20	34	10	28	26	21	25	42	85
12	3	3	15	8	17	11	15	19	6	15	18	18	26	37	57
13	1	4	15	12	13	15	19	34	11	25	25	26	13	40	87
14	1	1	19	13	15	23	15	41	13	29	26	16	24	51	84
15	2	3	21	18	25	27	25	25	11	32	27	19	28	70	89
16	1	3	19	12	17	18	18	42	11	27	26	17	22	47	81
17	2	2	11	8	14	17	19	30	12	24	27	19	35	39	82
18	3	2	18	10	10	22	22	25	10	27	26	26	16	42	89
19	1	4	22	15	23	24	24	23	8	27	25	16	19	62	76
20	1	1	13	12	19	16	14	34	8	25	25	15	36	37	73
21	5	1	21	14	13	22	17	45	12	29	28	20	20	49	89
22	3	3	19	11	18	24	25	24	12	26	22	17	19	53	77
23	1	2	12	13	25	20	20	36	13	25	22	14	40	58	74
24	5	7	19	13	16	22	19	41	11	37	28	24	28	51	100
25	5	1	19	14	21	20	20	38	9	29	24	12	30	55	74
26	3	2	16	14	23	23	14	29	8	29	21	7	33	60	65
27	4	5	10	9	21	22	18	44	5	27	19	16	28	52	67
28	5	5	17	15	24	19	21	42	11	31	22	20	29	58	84
29	1	8	13	16	20	19	23	33	14	37	34	24	42	55	109
30	7	1	20	11	18	23	22	16	10	21	22	19	12	52	72

APPENDIX B (continued)

Rank	L	F	K	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si	N	P
31	6	3	17	12	18	21	21	23	8	27	24	20	14	51	79
32	4	9	18	12	17	25	31	27	9	22	23	22	17	54	76
33	2	2	19	17	18	24	23	39	12	32	32	23	26	59	79
34	1	1	16	10	17	20	23	30	10	23	27	17	18	47	77
35	2	1	14	8	18	17	19	42	10	26	15	21	27	43	72
36	2	3	21	14	20	23	19	33	10	30	27	14	11	57	81
37	2	8	20	15	20	25	25	27	9	32	36	27	16	60	104
38	0	3	10	9	20	18	17	29	6	21	17	17	18	47	61
39	1	1	16	12	20	24	19	26	5	29	18	18	19	56	70
40	5	5	14	16	23	20	21	35	11	31	30	16	53	59	88
41	2	3	18	24	21	17	22	39	14	26	27	24	27	62	91
42	1	3	16	19	22	20	15	38	12	28	32	21	19	61	93
43	5	1	22	15	20	26	24	38	11	25	25	17	18	61	78
44	4	3	14	12	22	22	19	36	9	25	23	18	15	56	75
45	4	2	20	16	15	27	20	29	11	28	24	16	16	58	79
46	5	1	23	12	15	24	23	24	11	24	26	23	11	51	84
47	3	2	12	8	17	18	16	24	12	28	23	17	17	43	80
48	2	9	14	14	26	20	23	39	12	33	33	20	34	60	98
* 49	7	1	20	11	19	20	19	39	9	25	21	14	18	50	69
50	5	4	18	13	18	17	19	22	4	22	22	23	15	48	71
51	4	10	13	25	26	27	26	32	20	33	33	26	20	78	112
52	2	13	8	12	28	17	30	34	14	36	32	20	38	57	102
53	2	4	16	12	19	25	21	26	11	30	27	14	29	56	82
54	3	6	21	15	20	27	22	44	15	30	30	20	33	62	95
55	3	0	13	8	10	17	17	24	5	22	15	20	14	35	62
56	1	2	14	10	16	23	15	38	10	24	21	23	13	49	78
57	1	6	8	9	24	13	18	27	4	32	19	16	35	46	71
58	2	4	13	16	31	24	16	41	11	33	26	11	54	71	81
59	1	6	11	11	19	14	20	27	5	22	20	21	37	44	68
60	6	2	22	11	21	20	25	30	11	30	28	19	24	52	88

* Eliminated from study because of invalid MMPI.

APPENDIX C

STATISTICAL ANALYSIS OF THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY

MMPI Variables	High Creatives Means	S.D.		Low Creatives Means	S.D.		t
Lie	2.39	1.91		3.33	1.78		-1.53
Validity	3.72	2.87		4.44	3.45		- .68
K	14.83	4.03		15.78	4.91		- .63
Hypochondriasis	11.56	3.33		12.94	3.90		-1.14
Depression	18.44	3.91		20.33	5.19		-1.23
Hysteria	19.00	4.86		21.50	4.63		-1.58
Psychopathic Deviate	20.06	2.80		21.28	4.36		-1.00
Masculinity-femininity	28.63 40.40	5.93 3.95	Males Females	25.70 37.75	2.54 3.80	Males Females	1.30 1.44
Paranoia	9.17	2.83		10.56	4.12		-1.18
Psychasthenia	26.89	3.80		27.89	4.43		- .73
Schizophrenia	25.06	2.80		25.11	4.92		- .04
Hypomania	20.78	4.21		19.11	3.61		1.27
Social Introversion	24.56	6.22		24.89	11.62		- .11
Neurotic Triad	49.00	9.89		54.78	10.24		-1.72
Psychotic Tetrad	81.89	8.32		82.67	12.59		- .22
N	18			18			