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## ACKNOWLEDGMENTS

I extend my deep appreciation to Mrs. Judith Lansing and Mr. Henry Keller, physical education instructors at West Junior High School, for their assistance in the testing procedure.

Acknowledgment and appreciation are also expressed to my eighth grade physical education students, for without their inspiration this study would not have been possible.

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## ABSTRACT

HARRIS, NANCY ANN: The Relationship between Motor Creativity and Certain Personality Characteristics of Eighth Grade Girls (M.S. 1971)

Committee Members: Jeanne C. Galley  
Dorothy Martin  
Joseph Barto

**Purpose:** The purpose of this study was to determine the relationship between motor creativity and certain personality characteristics of eighth grade girls.

**Method of Research:** In order to investigate the above purpose, Wyrick's Motor Creativity Test and the California Test of Personality were given to 109 eighth grade girls enrolled in physical education at West Junior High School, Leavenworth, Kansas during the 1970-71 school year. Data was analyzed by means of the Pearson Product Moment Correlations between motor creativity test scores and personality test scores. The  $t$ -test was also used to determine differences between the means of the high and low motor creativity groups in personality.

**Results:** Significant relationships were found to exist between motor creativity and the personality components of self-reliance, sense of personal worth, freedom from withdrawing tendencies, social skills, freedom from anti-social tendencies, sense of personal freedom, feeling of belonging, nervous symptoms, and social

standards. Significant relationships were also found to exist between motor creativity and personal, social, and total adjustment. The high and low motor creativity groups were found to be significantly different in personal, social, and total adjustment.

Conclusions: It was concluded that relationships do exist between motor creativity and certain personality characteristics. Creative students differ from non-creative students in personality in that students who score high in motor creativity generally have a higher degree of personality adjustment than students who score low in motor creativity.

## Chapter 1

### THE PROBLEM AND DEFINITIONS OF TERMS USED

America is in the space age, an age where man is sending men to the moon, where man has developed more progress in science and technology in the past decade than in the total century before. However, man is still faced with many over-whelming problems. Man is in an age where he is required to reason out how he can cope with life's daily stresses. In the future, with the many problems facing our world, man's ability to reason and think creatively may mean the difference between survival and death. Education is going to have to meet this challenge of educating our children so they will be able to survive and grow to be healthy, happy, and productive citizens.

There are many educators who believe that educational objectives need to change. They contend that present objectives are not meeting this creative challenge. Torrance shows this need for creative education by his statement that

. . . Schools of the future will be designed not only for learning but for thinking. More and more insistently, today's schools and colleges are being asked to produce men and women who can think, who can make new scientific discoveries, who can find more adequate

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2. Is there a relationship between motor creativity and six components of social adjustment?

3. Is there a relationship between motor creativity and total personal adjustment?

4. Is there a relationship between motor creativity and total social adjustment?

5. Is there a relationship between motor creativity and total adjustment?

6. Is there a difference in personal, social, and total adjustment between subjects ranking high in motor creativity and those ranking low in motor creativity?

Statement of the hypothesis. In order to investigate the above questions, the following hypotheses were tested:

1. There will be no significant relationship between motor creativity and six components of personal adjustment.

2. There will be no significant relationship between motor creativity and six components of social adjustment.

3. There will be no significant relationship between motor creativity and total personal adjustment.

4. There will be no significant relationship between motor creativity and total social adjustment.

5. There will be no significant relationship between motor creativity and total adjustment.

6. There will be no significant difference in personal, social, and total adjustment between those ranking high in motor creativity and those ranking low in motor creativity.

Significance of the study. In recent years, there has been an increase of interest in the development of creativity in education. For this reason, physical educators have also become more involved in creativity in movement. The use of movement as a medium for expression provides one of the greatest opportunities for development of creativity in the individual.

However, the teacher's understanding of creativity is usually quite limited. There are many aspects of creativity which are still not fully understood. Researchers and educators are still attempting to answer these questions: What is creativity? How does the creative process come about? How is creativity measured and evaluated? What are the characteristics of a creative person? Do creative people have certain personality characteristics that distinguish them from non-creative people?

There is limited research available pertaining to creativity. If creativity is to be developed in the schools, one must first learn to identify creative talent. It was only recently that a reliable test of motor creativity was developed. However, it is not a practical instrument that can be used in a classroom setting to

diagnose and predict motor creativity. Perhaps the best way to identify creative talent is by some other means. In order to find these means one must understand the creative process and it's relationship with other human attributes. Researchers have found that people with outstanding creative talents in areas such as writing, science, art, and music tend to have different personality characteristics than non-creative people. One might question if certain personality characteristics distinguish those who are creative in movement from those who are not as creative. This is the question this study attempted to answer.

Limitations of the study. This study was limited to eighth grade females enrolled in West Junior High School, Leavenworth, Kansas. One-hundred and nine eighth grade girls enrolled in the physical education classes were used as subjects for this study.

Because of the nature of the motor creativity test, several factors made the test difficult to administer. The test required that it be given individually in order to avoid an exchange or copying of ideas. Although the subjects were told not to discuss the nature of the test with anyone, this factor still remained uncontrollable.

Also, attitudes, inhibitions, state of health, and physical handicaps of the subjects on the day of the tests were uncontrollable factors.

## Definitions of Terms Used

Creativity. Creativity refers to the process by which one produces new or novel ideas or products.

Motor creativity. In this investigation, motor creativity refers to the ability to produce original movement patterns to a specific stimulus.

Motor fluency. Motor fluency is the component of motor creativity having to do with the quantity of motor responses to a specific stimulus.

Motor originality. Motor originality is the component of motor creativity having to do with the uniqueness of the motor responses to a specific stimulus.

Personal adjustment. Personal adjustment is a component of total personality and refers to the manner and effectiveness with which the individual meets his personal problems. It is based on feelings of personal security. (42)

Personality. Personality is "the manner and effectiveness with which the whole individual meets his personal and social problems, and indirectly the manner in which he impresses his fellows." (42:2)

Social adjustment. Social adjustment is a component of total personality and refers to the manner



and effectiveness with which the individual meets his social problems. It is based on feelings of social security. (42)

Total adjustment. Total adjustment is the sum total of personal and social adjustment and refers to the manner with which the individual meets his personal and social problems. (42)

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According to Andrews (3), the extent to which it is developed depends upon the experiences to which children are exposed, the opportunities children are given for expression, and the encouragement they receive from participation in activities. However, Hay (20) stated that it seems teachers are often afraid of providing such experiences in the classroom. Many will avoid it unjustly because of the extra time, effort and noise which are necessary for the creative learning experience.

Before 1950, there was little attempt to study the nature of creativity or to measure it. Now there is nationwide interest largely as a result of a paper presented in 1950 at a meeting of the American Psychological Association. Guilford (17) spoke of the neglect of the subject of creativity, and outlined a research program to explore the subject. This section spearheaded much interest in defining, identifying, and developing creativity.

The word "creativity" has been used in many different ways by many types of people. Probably no single definition can cover all the meanings attached to it. Taylor (39) found 250 different definitions of the word "creativity." He then put these into five clusters of definitions: (1) expressive creativity, (2) productive creativity, (3) inventive creativity, (4) innovative creativity, and (5) emergentive creativity.

Rhodes (30) reported that out of about fifty definitions collected, he could roughly discriminate

four strands in terms of (a) person, (b) process, (c) press (interaction between human beings and their environment), and (d) products as embodiment of ideas. Thus, there could be many varied definitions as researchers have studied different aspects of creative behavior and have applied their own definition to the term.

A definition by Torrance seems to belong to the second category, process, in that creativity is defined as

. . . a process of sensing gaps or disturbing, missing elements; forming ideas or hypotheses concerning them; testing the hypothesis; and communicating the results, possibly modifying and retesting the hypotheses. (46:16)

Rogers seemed to prefer a definition in terms of the fourth category, products, in conjunction with the third, press. He defined it as

. . . 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. (27:65)

Words often mentioned in discussions of creativity are curiosity, imagination, discovery, innovation, invention, origination, ingenuity, production, and experimentation. Creative ideas eventually become evident in such things as scientific theories, inventions, improved products, novels, plays, poems, designs, paintings, dancing, gymnastics and anything that is imaginatively made possible.

From what has been found, there appears to be a wide variance in the definitions of the word "creativity."

Torrance (46) stated that there appears to be no absolute need for anyone to agree on a single, universal meaning of the term. There are too many different types of creative behavior to be represented by one definition. However, each investigator should be clear about what creativity means to him.

In order to identify and measure creative abilities, it is necessary to understand the nature of the creative process. There have been several attempts to explain how the creative process comes about. Andrews (3) stated the creative process comes about in three phases: (1) the child and his creative power, feeling and imagination; (2) the action or interaction of his experiences; and (3) his outward form of expression. The fundamental basis for creative expression is to be found in experiences.

Strang (37) relates that the creative process stems from the creative impulse and the natural curiosity of the child. It is specifically initiated by need and achieved as the child perceives related elements in his sensory experiences. By recognizing relationships among his perceptions and concepts, the child is able to re-organize his experiences into some fresh or different pattern that has unity and harmony. The sequence seems to be: (1) some inner drive or motivation such as the child's natural curiosity, the preadolescent's eagerness to find out, the adolescent's social purpose; (2) keen

perception of a situation; and (3) recognition of relationships which are later expressed in performance which in turn leads to satisfaction.

Hays (20) stated two qualities needed for creative expression: (1) concentration, or the ability to focus the mind upon the task at hand, and (2) imagination, or the ability to see the task in a different light.

Research has shown that certain conditions or atmospheres are needed for the development of creativity in the schools. Strang (37) emphasized that a creative atmosphere must contain (1) quietness, (2) warm and democratic relationships, (3) an inquisitive teacher, (4) a teacher alert to creative sparks, and (5) the proper timing. Also important are: (1) offering opportunities and materials for explorations, (2) building a background of knowledge and skill, (3) giving examinations that call for creativity, and (4) encouragement and reinforcement.

Smith (35) stated that the less restrictive or threatening atmosphere provides for a greater opportunity for the creative process. The climate should be one of acceptance without fear or threat and one of freedom to explore.

### Tests Identifying Creativity

According to Mooney (27), there are four approaches to the identification of creative talent: (1) the product created, (2) the process of creating, (3) the person of the

creator, and (4) the environment in which creation comes about.

For a considerable time, educators believed that the intelligence score represented imaginative ability. However, research has shown that intelligence and creativity are by no means synonymous. Also, a person's ability to memorize or define words tells very little about his ability to produce new and unique ideas.

Getzels and Jackson (15) found that intelligence is not a reliable predictor of creativity. After working with five hundred adolescents, they found that creativity and high intelligence tend to correlate up to a certain point. Torrance (46), as a result of his studies, estimated that creativity and intelligence correlate at about 120 intelligence quotient. He also estimated that by depending solely on intelligence tests, about seventy per cent of the most creative youngsters are neglected. As a result of studies completed at all levels of ability. Torrance (46) believed that although outstanding creativity is seldom found among children of below-average intelligence, some type of creative talent may be found anywhere along the scale except at the bottom.

Because of the fact that the intelligence score does not predict creative talent, attempts have been made to develop tests to measure one's ability to create.

According to Guilford (26), there are two areas in which

measurement is important: (1) the area of creative potential and (2) the area of creative performance or production. Most tests measuring the area of creative potential evaluate such traits as interests, attitudes, temperament, and motivations. However, tests that measure the area of creative performance involve a technique where the individual is given a task involving inventiveness and imagination. Among the most used tests are the Minnesota Tests of Creative Thinking, developed by Torrance. These tests present a wide variety of tasks for use in assessing creative thinking of students from kindergarten to graduate school.

During the past few years, a variety of tests have been devised. The earlier measures tended to involve either responses to inkblots or analogies. Current tests involve a variety of types of stimuli and materials, such as story completions, picture completions, and other problems.

### Characteristics of Creative People

Some researchers believe in order to identify creative talent, one has to know the characteristics of creative people. A teacher should be able to recognize a creative person by mere observation of his behavior.

Significant correlations have been found between certain traits of personality and creative performances. Most of the empirical studies seeking to determine the



personality characteristics of highly creative persons have relied upon the traditional personality inventories. In an attempt to determine the characteristics of creative people, three general age groups have been investigated: (1) adults, who may have been famous creators and inventors, (2) children, and (3) adolescents. Creative personalities in various types of areas, such as science, art, and others, have been studied.

Torrance (46), after surveying a large number of studies, compiled a list of eighty-four characteristics to differentiate highly creative persons from less creative ones.

Mooney, as reported by Strang (37), prepared a list of 266 items suggested as characteristics of creative people. He then reduced that list to fourteen main characteristics.

MacKinnon, as reported by Torrance (46), in a study involving college graduate students, found that those individuals who rated high on originality revealed a characteristic pattern of scores on an interest inventory. The more original subjects rated high on such scales as architect, psychologist, and author-journalist; and low scores on such scales as office man, banker, farmer, carpenter, policeman, veterinarian, and mortician. MacKinnon interpreted these findings by indicating that creative individuals are less interested in small details and the

practical and concrete aspects of life. They seem to be more concerned with meanings, implications, and symbolic meanings of things and ideas.

There has not been much research concerning the personalities of highly creative children. Torrance (46) explained the reason was that investigators have been afraid that children identified as creative may not develop creative talents as adults.

Two studies are notable concerning the personality of the highly creative child and his problems. Weisberg and Springer, as reported by Torrance (46), studied thirty-two gifted fourth graders and their families. They found certain personality factors predominating over others. Their conclusions concerning the personalities of creative children versus non-creative children were:

(1) The creative children had a greater acceptance of oneself and a greater self-awareness than the less creative children.

(2) The creative children were more sensitive and more independent than the less creative children.

(3) The families of the creative children were not particularly well-adjusted ones.

(4) The creative child was often the oldest sibling and not a particular favorite.

(5) The fathers of creative children had greater occupational autonomy or independence than children of less

creative ability.

Torrance (46), in 1959, analyzed the personality data concerning the most creative boy and girl in each of twenty-three classes in grades one through six in three elementary schools. Three notable personality characteristics stood out as differentiating the highly creative children from less creative children, but equally intelligent children. They were:

(1) Creative children had a reputation for having wild or silly ideas, especially the boys.

(2) Their work was characterized by the production of ideas "off the beaten track, outside the mold."

(3) Their work was characterized by humor, playfulness, relative lack of rigidity, and relaxation.

Several studies have focused on the personality characteristics of creative adolescents. Getzels and Jackson (40) differentiated highly creative adolescents from highly intelligent ones. They found that the difference between the two groups was the creative adolescent's ability to produce new forms and to risk joining together elements usually seen as independent and dissimilar. The creative adolescent seemed to enjoy the risk and uncertainty of the unknown. These differences were reflected in the occupational choices of the two groups. Sixty-two per cent of the creative adolescents chose unconventional occupations while eighteen per cent of the

highly intelligent chose such occupations; and eighty-four per cent of the highly intelligent chose conventional occupations. Torrance (46) also found much value in the risk-taking concept. He found that it was an important trait of creative people after an intense study of thirty-one American ace jet pilots. After interviewing these men about their combat experiences and their childhood experiences, it was found that the most salient characteristic of the ace was his ability to test the limits or take calculated risks.

Hammer, as reported by Torrance (46), explored the personalities of gifted adolescent artists. On the basis of elaborate psychological studies, he found that the truly creative person exhibited deeper feelings, greater original responsiveness, preference for the observer role over the participant role, stronger determinations and ambitions, integration of feminine and masculine components, greater independence, rebelliousness, self-awareness, stronger need for self-expression, greater tolerance for discomfort, and a fuller range of emotional expression.

Getzels and Jackson (16) found high school students, who were high in creativity tests, show a strong sense of humor. Other studies supported this theory.

Rivlin (31) studied the creative personality in a high school population. One hundred and twenty-six subjects were nominated by their teachers as either creative or

non-creative, and the two groups were compared with regard to self-attitudes, sociability, and certain background information. The results indicated that the student selected as creative emerged as a rather sociable individual evaluating himself as more confident in his relationships with people, more popular and creative as viewed by his peers than his non-creative counterpart. It was also found that the creative student did not differ in over-all self-attitudes from the non-creative student. It was suggested that a number of trait combinations might be equally conducive to creativity. The study did indicate that in the case of high school students, two factors associated with creativity appeared to be social confidence and parents who attained a somewhat higher educational level.

Maslow, as reported by Haefele (18), emphasized that mental health was a necessary requisite for creativity. He stated that a healthy person is free to let himself go because he is not too concerned about his own inner conflicts, and that he is able to cope with risk and is willing to take the chance.

There have been few attempts to develop a personality instrument solely for the purpose of identifying creative talent. These tests are usually judged on terms of criteria known to be characteristic of creativity. Cattell, as reported by Haefele (18), has produced one of the most significant tests. By obtaining biographies of

historic persons noted for their creativity, he devised a description of the creative individual in terms of a personality profile of the creative individual. His conclusions were: (1) The same creative traits were found in creative men from all disciplines. The most important traits outstanding in creativity were that the individual is more schizothymic, more dominant, more inhibited, more emotionally sensitive, more radical, and more likely to show an exacting self-concept.

### Summary

The studies indicate, despite the fact that creativity is a rather new concept to education, much has been done to further define and locate creativity. These conclusions can be drawn concerning creativity:

(1) Since there appears to be many different types of creative behavior, there is a wide variation in how creativity should be defined. However, nearly everyone agrees that almost all of them involve the production of something new or unique as a result of sensing something missing, forming ideas, testing these, and finally, communicating the results. The communication may take form in objects produced, theories or ideas stated or written, or even in movement.

(2) The creative process is an active process in which the person has to be free to explore and express.

(3) Finding accurate methods of identifying

creative talent is important is creativity is to be nurtured in the schools. A variety of tests have been devised.

LITERATURE ON CREATIVE THINKING  
AS RELATED TO PHYSICAL PERFORMANCES

Experimental studies of the relationship between creative thinking and motor ability have been minimal. It would seem that physical education provides a climate and the experiences which foster the creative process. Sports, games, gymnastics, swimming, and dance provide an opportunity for creative talents to become expressed.

Barrett, as reported by Gaier (14), examined the relationship between creative thinking ability and achievement in selected motor skills of 362 elementary school children in the fourth through sixth grades. Creative thinking abilities were assessed with the verbal and non-verbal battery of the Minnesota Tests of Creative Thinking. Motor skills were evaluated by use of the Latchaw Motor Achievement Tests for Fourth, Fifth, and Sixth Grade Boys and Girls. It was found that the tested creative thinking ability was virtually independent from motor ability as measured by the Latchaw Tests.

These negative findings have been explained by others. (14) Studies have shown that creative people are impulsive, aggressive, dominating, and characterized by a

lack of deliberation, self-control, and restraint.

Therefore, the study of elementary children in a laboratory setting may evade any real assessment of motor skills and creative thinking ability. Two reasons were given as to why the two tested factors did not seem to have any relationship: (1) The samples have usually had school children who must still perfect muscular control through self-discipline and formal practice. (2) It may be that success in athletics is dependent upon not deviating from the discipline and rigor demanded in training.

Thomas (41) also found negative results when attempting to determine the difference in verbal creativity between college women athletes and college women dancers. The subjects were given the Minnesota Tests of Creative Thinking. Scores were achieved for the creativity factors of originality, flexibility, and total creativity. The subject's skill level and experience were assessed by means of a personal questionnaire. Thomas concluded that college athletes and college dancers, regardless of skill level, did not differ in creative thinking abilities.

Stroup and Pielstick (38) studied the relationship of motor ability to verbal creativity. Ninety-seven boys in the sixth grade were given the Iowa-Brace Test of General Motor Ability and selected Torrance tests, involving verbal responses. The tests were given one year apart. The researchers found no significant correlations



between motor ability and verbal creativity. They attributed their findings to three reasons: (1) the year's interval between the two tests, (2) failure of both tests to measure accurately verbal creativity and motor ability, and (3) the difference in the muscle coordination requirement of the motor ability test and the verbal creativity test. It was also mentioned that no consideration was given to the subject's ability to create unique movements.

Torrance (47) found conflicting results to the previous studies. He studied the effect that movement education classes had upon the verbal creativity scores of elementary school children. The Non-Verbal Form B of the Minnesota Tests of Creative Thinking was used and tested the creativity factors of fluency, flexibility, originality, and elaboration. After five months of emphasis on creative movement activities within the physical education class, the subjects showed a significant gain in fluency, flexibility, and originality. Only the factor of elaboration failed to be significant. It was concluded that performance on creative paper and pencil tests can be improved by organized instruction in creative movement education.

## LITERATURE ON MOTOR CREATIVITY

### Motor Creativity Tests

Very little has been written on motor creativity, and there have been few attempts to measure it. However,

there are numerous measuring tools available for the evaluation of creative thinking. In the past, most educators have attempted to measure motor creativity in terms of subjective evaluations of performances.

Withers (51) attempted to measure creativity of modern dancers by use of subjective evaluations of technique. The test involved movement tasks which the judges evaluated; and also an attempt was made to measure the dancer's creativity by the use of Guilford's verbal creativity tests. Only eleven subjects, who were college graduate students, were used. Comparisons were made between verbal creativity and creative dance ability. It was found that skill and creativity were related. Withers found significant correlations between the over-all creativity rankings of the judges and the technique ranking. It was concluded that technique implied a greater freedom for creative expression.

In 1968 the first objective test of motor creativity was developed. Wyrick (53) used twenty-five college women as subjects for the development of the test. Four test items were devised for each of four motivators: rubber balls, parallel lines, a red hoop, and a low balance beam. There were sixteen items in all. Two items for each motivator were administered to the subjects on one day and the other two for each motivator were administered on the following day. The items were designed as stimuli for

tests capable of differentiating individual ability to produce both number and uniqueness of motor responses in problem solving tasks of a motor nature. Face validity was accepted for the tests. The reliability was investigated by the equivalent-form reliability as indicated by the day-to-day correlations, and the internal consistency as measured by the split-half method. Only day I data were submitted to multiple regression analysis to determine the best test battery. From this, three test forms emerged from the analysis. One form was made to measure only motor originality, one form to measure only motor fluency, and one form to measure the combination of the two (motor creativity). The correlation between motor fluency and motor originality was quite high. Due to this finding, Wyrick concluded that since tabulating frequency of occurrence was a very tedious and time consuming job, the results may be obtained by simply tallying responses.

#### Motor Creativity and Motor Abilities

There have been two studies comparing motor creativity with other human qualities. Wyrick (52) investigated the relationship of motor creativity with motor ability, intelligence, and certain factors of verbal creativity. The subjects were 102 freshmen women enrolled at the University of Texas. To measure the factors of ideational fluency, originality, and sensitivity to problems of verbal creativity, the researcher selected tests

from the Kit of Reference Factors for Cognitive Measures published by the Educational Testing Service. To measure motor creativity, the researcher chose three motor creativity test items which she had earlier devised. The motor ability test given was the Scott Motor Ability Test, which consisted of the obstacle race, basketball throw, and standing long jump. The intelligence scores were obtained from school records. The investigator found: (1) No significant relationship was found to exist between motor ability and motor creativity. The correlations ranged from .02 to .21. (2) No significant relationship was found to exist between motor creativity and intelligence. Correlations ranged from -.02 to .15. (3) No significant relationship was found to exist between motor creativity and verbal creativity. The highest correlations between tests of motor creativity and verbal creativity were those among the motor fluency test and the verbal fluency test, but these were not significant. The range was from .05 to .37.

Philipp (29) studied the relationship of motor creativity with figural and verbal creativity, and selected motor skills. The factors of static strength, explosive strength, static balance, and agility were the selected motor skills. The investigator used sixty-five fourth grade subjects and found (1) no significant correlation exist between motor creativity and the other creativity scores, and (2) motor creativity failed to show

significant relationships with any of the motor skills, intelligence, age, or size. Philipp concluded:

(1) The expression of motor creativity through movement is not related to performance on the selected motor skill tests.

(2) Creativity does not appear to be a generalized trait since significant relationships were not found between the various aspects of creativity.

(3) A tendency toward generalization of creativity was found for girls but not for boys.

(4) A combination of weight, figural fluency and figural originality accounts for a significant amount of the variability in motor creativity for boys. Therefore, these appear to be the best battery to use to predict motor creativity for boys. A combination of figural and verbal creativity factors does the same for girls. It was also stated that motor creativity appears to be more related to motor skills than the other forms of creative expression.

## LITERATURE ON PERSONALITY

### Definition of Personality

The word "personality" is one of the most abstract words in our language. There have been many attempts to define it. It has not only been of great interest to psychologists, but also to theologians, sociologists, and biologists. Each one has defined the term differently

according to the approach in which they observed and studied it. Actually there may be no single, correct definition of personality.

The term "personality" is believed to have derived from the Latin persona. Persona originally denoted the theatrical mask used in ancient Greek and Roman drama. From then on, personality definitions emerged somewhat slowly but in quantity. Allen (1) stated that definitions have ranged from the early mask concept to a wide variety of systematic approaches by functionalists, behaviorists, psychoanalytical psychologists, and field theorists.

Allport (2) made a thorough study of the various meanings which the term has acquired in the areas of theology, philosophy, law, sociology, and psychology. In his summary of this research, Allport included fifty different definitions.

Since the psychological meanings are of interest in this study, the researcher is more concerned with these definitions. Allport (2) sorted the psychological meanings of personality into five basic classes:

(1) Omnibus definitions, perhaps the most common type, which are put in terms of the sum-total of attributes.

(2) Integrative and configurational definitions, which stress the organization or patterning of personal attributes.

(3) Hierarchical definitions, known by the demarcation of various levels of integration of organization.

(4) Definitions in terms of adjustment, used by biologists and behaviorists, who tend to view personality as a mode of survival, or as adjustments made to the environment.

(5) Definitions in terms of distinctiveness, which stress the patterns that set off one individual from others.

Cattell also illustrated the ambiguity of the term by stating that it can involve such complex meanings and that no one can pretend to know what it is and define it. The difficulty lies in the fact that

the reactions which constitute the data of personality study are all the reactions of the organism: its reactions to people, things, and ideas; its partial reaction, as in reflexes, and its total reaction; its conscious reactions and its unconscious reactions. (7:15-16)

### Components of Personality

Those who study and attempt to measure personality should have some knowledge of the components and elements which make up personality. There appears to be no absolute certainty concerning the exact number and the specific names of the characteristics which make up personality, and there have been several attempts to list the components of personality.

Allport (2) stated that it was impossible to say how many common traits of personality there are and

suggested that there may be at least 5000. However, present personality studies have been concerned with only about 300 common traits. There also appears to be a great deal of disagreement among psychologists as to the most important traits.

Allport (2) further listed a number of common traits with which psychologists have been concerned. They are grouped under underlying psychobiological factors, expressive traits, and attitudinal traits. The psychobiological factors, which are not traits, represent the raw material from which traits develop, and include symmetry, health vitality, intelligence, and temperament. The expressive traits include ascendance, expansion, and persistence. The attitudinal traits include extroversion-introversion, attitudes directed toward self, others, and values.

Allport and Odbert, as reported by Cattell (7), have listed some 4,500 trait terms in the English language. Cattell (8) found that this list could be reduced, however, to about 160 terms, which comprise a kind of Basic English for the complete description of personality. Some additional traits were later added to these making a total of 171 traits, as listed by Cattell (7), as a list of variables constituting the complete personality sphere.



## Personality Tests

To develop accurate measures of personality has been a challenge to many psychologists. As a result, there have developed many attempts to identify personality characteristics by the use of a variety of instruments. To many, this was a very difficult job and different from measuring something that is clearly observable. According to Allen (1), the difficulty lies in the fact that the subject matter is the hidden and unconscious drives of behavior that do not yield to direct observation and that the personality test attempts to measure the abstract-- motives, attitudes, and ideas that make up each individual person.

Personality assessment began in early cultures with humoral and morphological types. During the nineteenth century, as Galton inquired into the imagery, hereditary genius, and personality typology, Kerner made use of the projective type of test with inkblots. In the later nineteenth century Benet and Henri, Dearborn, and Sharp laid the basis for the assessment of personality with varying degrees of stimuli and materials. (1)

Following the projective types of tests, the paper and pencil type of tests emerged. These included inventories, questionnaires, and schedules of different types. Woodworth, during World War I, developed the first structured personality inventory with forced-choice items.

This test consisted of 116 questions which were used to screen out those who were psychologically unfit for military service. (9) Since then many hundreds have been developed with most of them being developed during the 1930's and 1940's.

At the present time, there are two types of tests of personality: (1) standardized questionnaires (pencil and paper tests), and (2) behavioral scales (performance tests). The latter consists of analysis of responses to word-associations, inkblot interpretations, or behavior in some miniature situation.

The personality questionnaire appears to be the most popular type in usage today. Ellis (10) cited several research studies pointing out the value of the personality inventory over the behavior scales.

#### Development of the California Test of Personality

The California Test of Personality (42, 43) is one of the many questionnaires that has been developed. The test was devised by Thorpe, Clark, and Tiegs, and was published by the California Test Bureau. The development of this test proceeded from a study of over one thousand adjustment situations which children and youth face in and out of school. The situations were classified into sixteen groups, or components of personality. After the list of one thousand situations had been carefully selected by

by the authors, it was submitted to teachers, principals, students, test experts, and counselors for their estimates as to the appropriateness of the items. Many items were discarded as being unsuitable. The authors found that pupils did not like to respond honestly to certain types of factual items which appeared important as indicators of adjustment; so they attempted to obtain the maximum number of correct responses by rationalizing as many as possible for the pupil. The final selection of items resulted in tests available for five age levels with two forms for each.

In establishing the validity of the test, Johnson (22) administered the California Test of Personality to 100 high school students and also had the students interviewed, rated by the experimenter, and rated by their teachers and parents. It was reported that the test yielded the most effective evaluation of personality.

Havighurst (19) selected the California Test of Personality for his studies of personality. He believed that such a questionnaire would yield a maximum of relevant information. He answered the attack that some ask whether one can take at face value subject's replies to questions about his personal and social attitudes. Havighurst stated that responses to such questionnaires can be accepted as giving a fair picture of the subject's feelings and opinions about himself, or at least what he

is willing to have people think those feelings and opinions are. According to Havighurst, how factual and exact his statements are is of lesser importance than how the subject conceives himself and his adjustment.

Studies Related to Comparisons of  
Personality Characteristics and  
Other Physical Performances

The importance of physical activity for the individual in promoting psychological development has long been a belief among physical educators. Ulrich stated that

The patterns of man's mobile behavior is related to his personality structure. It is possible to influence the personality through both types and patterns of movement. Conversely, the personality of man gives his movement strong directives. (48:119)

But it appears, according to the studies, that it is not clear exactly as to how physical education affects one's personality.

Comparative studies involving personality characteristics and various measures of physical performance have taken many directions. There was found to be four different types of studies done, which this paper will briefly review: (1) relationship between personality traits and athletic performance, (2) relationship between personality traits and measures of physical fitness, (3) relationship between personality and selected physical education activities, and (4) comparisons between various motor ability tests and measures of personality.

Most studies have been conducted with male subjects. Few have studied the personalities of females as related to physical performances. Also most studies have been conducted at the college level. There are few on the high school level and even fewer on the junior high school level.

Relationship between personality traits and athletic performance. Much of the research in the area of athletics has shown that participation in athletics is beneficial to one's psychological growth. Booth (5) found differences in personality do exist between athletes and non-athletes and between participants in individual sports, team sports, and team-individual sports. According to measures on the Minnesota Multiphasic Personality Inventory, the traits of dominance, anxiety, and social responsibility were related to athletic ability. Also the varsity athletes in individual sports scored significantly higher in the depression and the psychasthenia variables than did the athletes who participated in team sports.

Sperling (36), using a Human Behavior Inventory and four additional scales, compared the personality characteristics of men who participated in varsity athletics, intramurals, and non-athletes. In the traits of ascendance and extroversion, the varsity and intramural groups proved to be superior to the non-athlete group. Also, the greater the experience of the athlete, the more ascendant and extroverted they were.

Schendel (33) studied the personality traits, as measured by the California Personality Inventory, of athletes and non-athletes at three educational levels. It was found that significant differences did exist between the means of athletes on eight scales at the ninth grade level, four scales at the twelfth grade level, and nine scales at the college level. However, desirable personality characteristics seemed to decrease with athletic experience, and the ninth and twelfth grade athletes showed greater scores in poise, ascendancy, and self-assurance.

Lareau (24) studied the relationship between athletic competition and personal and social adjustment of junior high school girls. The subjects were divided into three groups: (1) team members, (2) those interested in athletics and failed to become members of the team, and (3) those not interested in competition. The team group showed a more favorable personal and social adjustment and were more popular. The second group, which failed to make the team, showed disruption in personal and social adjustment showing high anxieties and being low in emotional stability. The not interested group proved to be less active, less popular, and more introverted.

Peterson, Weber, and Trousdale (28) compared the personality traits of women in team sports and women in individual sports. According to Cattell's Sixteen Personality Factor Questionnaire, women athletes who

competed in individual sports were found to rate higher on the personality factors of dominance, adventurousness, sensitivity, introversion, radicalism, and self-sufficiency, and lower on the factor of sophistication when compared to those in team sports. It was noted that they were also more independent, liked to make their own decisions, and expressed dissatisfaction with group situations.

In general, it has been found that athletes who participated in sports are more socially oriented, more aggressive, and more well-adjusted than the non-athletes.

Relationship between personality and physical fitness. Weber (49) studied the relationship between physical fitness and personality of college freshmen males. There was no significant relationship between physical fitness and scores in the nine measures of personality of the Minnesota Multiphasic Personality Inventory. It was concluded that the physically fit have no more stable traits of personality than do the physically unfit.

Tillman (44) found conflicting conclusions when comparing physical fitness with personality traits of junior high and senior high school boys. According to the scores on Cattell's Sixteen Personality Factor Questionnaire, the boys, who ranked in the upper fifteen per cent on the American Association for Health, Physical Education, and Recreation Youth Fitness Test, were found to differ

significantly in personality traits from those who ranked in the lower fifteen per cent. The upper group scored significantly higher on the factor of ascendance. On the basis of these studies, no specific conclusion could be made concerning the relationship of personality with physical fitness.

Relationship between personality and selected physical education activities. Several studies have been concerned with personality and its effects upon the type of activity in which one chooses to participate. Flanagan (12) found that personality is a factor in selecting one physical activity over another in studying college male students taking voluntary classes in fencing, badminton, basketball, volleyball, boxing, and swimming. Fencers proved to be more ascendant and more feminine than those who participated in other sports.

Bosco (6) studied the personality characteristics of male gymnasts as compared with normal college men. On Cattell's Sixteen Factor Questionnaire, the gymnasts were found to be significantly greater in brightness and intelligence, calmness and maturity, conventionality and seriousness, confidence and unshakable demeanor, criticism and experimentation, and control and exactness. It was concluded that gymnasts readily expressed these personality traits. It may be noted here that gymnastics may be considered a more creative activity than some of the other



activities. The characteristics of criticism and experimentation are frequently noted also as characteristics of creative people.

Slusher (34) compared the personality characteristics of high school athletes in baseball, basketball, football, swimming, and wrestling. It was found that according to scores on categories of the Minnesota Multiphasic Personality Inventory, the swimming group showed the least neurotic profile of all athletic groups. The football and wrestling groups showed the most neurotic profiles.

#### Relationship between personality and motor ability.

The majority of the studies seem to indicate that there is a relationship between level of motor ability and personality. Wilson (50) attempted to determine the relationship between specific factors of personality adjustment and levels of motor achievement in a select group of junior and senior high school boys. It was concluded that individual group dependence was a factor in the extent of exhibited motor achievement and that levels of motor achievement were predictable with the use of grouped measures of personality characteristics.

Biddulph (4) compared the personal and social adjustment of high school boys of high athletic achievement as compared with the adjustment of boys of low athletic achievement. On the California Test of Personality, students ranking high in athletic achievement

demonstrated a significantly greater degree of personal and social adjustment than did the students ranking low in athletic achievement.

Different results were achieved by Keogh (23) when comparing motor ability with personality characteristics. No significant relationship was found to exist between motor ability and the eighteen scales of the California Psychological Inventory. The lower and middle motor ability groups ranked higher on the main effects. Also athletic participation did not appear to have any effect upon the measures studied.

Merriman (25) also used the California Psychological Inventory, but found different results. When comparing the upper motor ability group with the lower motor ability group, it was found that motor ability is related to personality traits. The upper motor ability group scored significantly higher than the lower motor ability group on measures of poise, ascendency, and self-assurance.

A few studies have been conducted comparing the personality characteristics of girls with motor ability. Frabony (13) administered the California Test of Personality and the Scott's Motor Ability Test to eleventh grade girls. No significant correlation was found between motor ability and personal and social adjustment.

Ferguson (11), using Scott's Motor Ability Test and the California Psychological Inventory, investigated

whether adolescent girls of high motor ability differ from adolescent girls of low motor ability in certain personality characteristics. Their behavior in the classroom was also assessed. The high motor ability group scored significantly higher on the dominance, sociability, self-acceptance, and communality scales; and the classroom teachers indicated that these girls were more motivated and more self-reliant in the classroom than the low motor ability girls. Girls in the low motor ability group were described as being purposeful, cooperative but retiring, and unresponsive.

#### Summary

The studies indicate that much has been done to further define, identify, and measure personality characteristics. There seems to be an abundance of material relating personality to physical performances. However, due to the wide variation in findings, no exact conclusion can be drawn concerning the relationship of personality to these physical performances.

#### SUMMARY OF THE REVIEW OF LITERATURE

The four categories under which the related literature was classified were: (1) literature on creativity; (2) literature on creative thinking as related to physical performances; (3) literature related to motor creativity; and (4) literature on personality.

The literature on creativity indicated that creativity is an active process in which a person is free to explore and comes up with some type of creative communication. There are specific tests available for measuring creative thinking ability, and creative people appear to have common personality characteristics.

The relationship of creative thinking with physical performances has been studied. Most studies indicated that these two factors are unrelated. However, one study indicated that creative thinking could be improved by instruction in creative movement.

There was limited research on motor creativity. However, relationships between motor creativity and the factors of motor abilities and creative thinking have been investigated. Negative relationships have been found between motor creativity and the factors of motor abilities and creative thinking. There have not been earlier attempts to determine relationships between motor creativity and personality.

There has been extensive research on personality. There have been few agreements on the subject, and there have been many attempts to define and measure personality characteristics. Extensive research has also been conducted concerning the relationship between personality and selected physical performances. There has been a wide variation in findings.

## Chapter 3

### TESTING PROCEDURE

The purpose of this study was to determine the relationship between motor creativity and certain personality characteristics of eighth grade girls. A second major purpose was to investigate the difference in personality between subjects high and low in motor creativity. In an effort to find these relationships, the researcher administered Wyrick's Motor Creativity Test and the California Test of Personality to the subjects.

### PILOT STUDY

Because of the difficulty in administering and scoring the Motor Creativity Test, a pilot study was conducted in order that the researcher could become skilled in the administration of the test. Other purposes of the pilot study were: (1) to determine if a wide enough range of scores could be obtained from eighth grade subjects; (2) to determine the amount of time the test would take to administer to each subject; (3) to locate any problems that might occur in administering the test; and (4) to determine the type of scoring procedure to be used for the sample.

The subjects used in the pilot study were ten seventh and eighth grade females. The ages of the subjects ranged from twelve to fourteen years, and were members of the school's gymnastic club which met four days a week after school during the spring semester of 1970. The subjects were given a selected battery of three tests of motor creativity. The three tests selected were those which were given by Wyrick (53) as the best combination of tests to measure motor creativity. The tests, which are described in Appendix A, were: (1) the parallel line test, (2) the wall-ball test, and (3) the hoop test. The same tests were later given to the larger sample for the major portion of this study.

The tests were given individually in an enclosed room adjacent to the gymnasium, with only the subject and the tester present in the room. The subjects were individually called to the testing room without previous knowledge that they were going to take the test. The test was given according to the directions given by Wyrick.

As a result of the pilot study, the researcher made these observations concerning the administration of the test:

- (1) The total fluency scores, or total responses, ranged from five to thirty-two responses, with the mean of the scores being 15.6. This seemed to be a fairly wide

range for ten subjects. It was assumed that the test would provide a wide variation in scores.

(2) The more often the test was administered, the easier it was to interpret and record the responses.

(3) It was observed that the three-item battery would take approximately fifteen to twenty minutes to administer to each subject.

(4) Wyrick (53), in her study, stated that the results obtained by simply tallying responses was an adequate method of scoring the test. There was also evidence that there was a very high relationship between fluency and originality in creative tests. This eliminates the tedious job of tabulating frequency of occurrence of unique movements in the sample. As a result of the pilot study, it was found that with ten subjects, tabulating the frequency of occurrence of unique movements was too difficult and time-consuming. Therefore, it was decided to use only the fluency scoring technique.

(5) It was found that parts of the directions given by Wyrick for these tests were above the comprehension level of the subjects. Therefore, the directions were simplified to fit their level of vocabulary.

#### SUBJECTS

The subjects used in the study were 109 eighth grade females ranging from twelve to fourteen years in age.

The subjects were students enrolled in the physical education classes at West Junior High School, Leavenworth, Kansas. The students were scheduled into physical education classes every other day. On the days the subjects were not in their physical education class, they were in their art class.

#### TESTING PROCEDURE

The subjects were administered the California Test of Personality and Wyrick's Motor Creativity Test in the spring semester of 1971. The California Test of Personality was administered in the lecture room during the regular physical education class period. The test was administered and scored by the researcher. The test required approximately forty to fifty minutes to complete. The test directions were read to the subjects according to the Test Manual. No mention was made of the experimental purpose of the test.

The motor creativity tests were administered within a month of the personality tests. The Motor Creativity Test required that it be given to one person at a time to avoid an exchange or copying of ideas. The subjects were individually called from their physical education class during the day. The subjects had no previous knowledge of the testing arrangement.



The tests were given individually in an enclosed room adjacent to the gymnasium. The room was entirely empty except for the testing apparatus, so that the subject would not be distracted by surrounding activity. Only the subject and the tester were present in the room. When subjects entered the testing room the tester recorded such information as name, age, and birth date. The subjects were then verbally given the general instructions for the test. The subjects were informed that they were not to discuss the nature of the test with anyone. No mention was made of the purpose of the study. The instructions were read for each of the three test items, questions were answered, and the responses were recorded for each item by the researcher.

#### PERSONALITY TEST

The California Test of Personality (42) was selected by the researcher to assess the subject's personality characteristics. It was selected due to the fact it was a standardized instrument that could be handled in an objective, statistical manner. It is also easy to administer and score. The test is an efficient method of distributing the scores along a continuum of adjustment. It is also one of the few available personality tests that has a form for below high school age.

This study utilized form AA for use in the intermediate grades seven to ten. The test assumes that the individual is in a constant state of adjusting to problems. The test of personality is organized around the concept of life adjustment as being a balance between personal and social adjustment. It is comprised of two sections: (1) personal adjustment and (2) social adjustment. Personal adjustment is based upon feelings of personal security including (A) self-reliance, (B) sense of personal worth, (C) sense of personal freedom, (D) feeling of belonging, (E) freedom from withdrawing tendencies, and (F) freedom from nervous symptoms. Social adjustment is based upon feelings of social security including (A) social standards, (B) social skills, (C) freedom from anti-social tendencies, (D) family relations, (E) school relations, and (F) community relations. Scores are available on each of the sub-sections and through the summation of the personal and social adjustment scores, a total adjustment score can be obtained.

The test consists of 180 questions about the subject's thoughts, feelings, habits, opinions, and experiences with each question to be answered yes or no. The score is the number of favorable replies.

The responses of each pupil were interpreted with respect to raw scores. Scores in total adjustment, personal adjustment, social adjustment, and in each of the

twelve components of personality were used.

### MOTOR CREATIVITY TEST

The Motor Creativity Test was selected because it is the only available instrument statistically supported as a test of motor creativity. The test involves three test items, each with a different motor problem designed to permit the subjects to express creative ideas through motor responses of the body.

#### Test Item I - Parallel Line Test

The test incorporates two lines drawn on the floor one inch in width, six feet along, and six feet apart. The subject is to begin at line one and perform a movement that incorporates a twist or a turn at some point in it until she reaches line two, whereupon she is to return to line one with a different movement. The subject is to continue moving between the lines, each time with a different turning or twisting movement, until the time is consumed.

#### Test Item II - Ball-Wall Test

Three rubber playground balls eight inches in diameter are used for this test. The subject is to move a ball, by striking or hitting only, to the wall in as many different ways as she can. It makes no difference where on the wall the ball lands, as long as the ball reaches the

wall. The subject may not move her body beyond the restraining line which is eight feet from the wall.

### Test Item III - Hoop Test

A hoop three feet in diameter is used for this test. The subject is to pick up the hoop from the floor in as many different ways as she can. The entire hoop does not have to leave the floor in order to count as being picked up. When the subject has gotten all or most of the hoop off the floor, she may replace it and demonstrate a different method of picking it up.

### Timing

The ball-wall and the hoop items are timed by a stop watch, from the subject's first response to the conclusion of three minutes. However, on the parallel line test, the three minute period is initiated at the conclusion of the subject's first response, and the stop watch is allowed to run only when the subject is standing outside the restraining lines and not responding.

### Scoring

Due to the results of the researcher's pilot study and other studies showing the high relationship between fluency and originality in creativity tests, only the motor fluency scores for each test item were computed. The motor fluency score was the sum of the responses of the subject on each item. A total fluency score was

then computed by summing the three fluency scores of each individual test item.

### Validity and Reliability

Face validity was claimed by Wyrick in establishing the validity of the test. To establish the reliability of the test, a multiple regression coefficient of .97 was found for the three-item battery.

### STATISTICAL PROCEDURES

The major statistical procedures used in this study were the Pearson Product Moment Correlation Coefficient and the  $t$ -test of the difference between means as explained by Herink (21).

The Pearson Product Moment Correlation Coefficient was used to determine the relationship between motor creativity and each of the fifteen personality scales as measured by the California Test of Personality.

The  $t$ -test was employed to determine if there were significant differences in personal, social, and total adjustment between subjects ranking high in motor creativity and those ranking low in motor creativity.

## Chapter 4

### ANALYSIS OF DATA

The purpose of this study was to determine the relationship between motor creativity and certain personality characteristics measured by the California Test of Personality. A second purpose was to determine if there were significant differences in personality between subjects ranking high and low in motor creativity.

#### STATISTICAL CORRELATIONS OF MOTOR CREATIVITY WITH EACH OF THE PERSONALITY COMPONENTS

In order to determine the relationship between motor creativity and personality characteristics, Pearson Product Moment Correlation Coefficients were computed. On the California Test of Personality, twelve scores were available for each of the twelve personality components. Also provided were the total personal, total social, and total personality scores. A total of fifteen scores were available for each subject. Pearson Product Moment Correlation Coefficients were computed for each of the fifteen personality scores with the motor creativity scores. One hundred and nine female subjects enrolled in the eighth grade took the motor creativity tests and the personality

tests. Table 1, page 54, shows correlations of the personality scores with motor creativity scores. With 107 degrees of freedom, .195 was necessary for the correlations to be statistically significant at the .05 level; and .254 was needed for significance at the .01 level.

Motor Creativity and  
Self-reliance

A correlation of .37 was found between motor creativity and the self-reliance component of personality, which indicated a statistically significant relationship at the .01 level.

Motor Creativity and  
Sense of Personal Worth

A correlation of .31 was found between motor creativity and the sense of personal worth component of personality. A statistically significant relationship was found to exist at the .01 level.

Motor Creativity and  
Sense of Personal Freedom

A correlation of .20 was found between motor creativity and the sense of personal freedom component of personality. A statistically significant relationship was not found to exist at the .01 level. However, a slightly significant relationship was found at the .05 level since .195 was necessary at that level.

Table 1

**Correlation of Motor Creativity Test Scores  
to Personality Test Scores**

Personality Scales	r	Level of Significance
Self-reliance	.37	.01
Sense of Personal Worth	.31	.01
Sense of Personal Freedom	.20	.05
Feeling of Belonging	.21	.05
Freedom from Withdrawing Tendencies	.26	.01
Freedom from Nervous Symptoms	.23	.05
Social Standards	.22	.05
Social Skills	.32	.01
Freedom from Anti-social Tendencies	.28	.01
Family Relations	.18	--
School Relations	.19	--
Community Relations	.16	--
Personal Adjustment	.37	.01
Social Adjustment	.63	.01
Total Adjustment	.47	.01

.195 was needed for significance at the .05 level with 107 degrees of freedom.

.254 was needed for significance at the .01 level with 107 degrees of freedom.



Motor Creativity and  
Feeling of Belonging

A correlation of .21 was found between motor creativity and the feeling of belonging component. Since .254 was necessary for the relationship to be statistically significant at the .01 level, a significant relationship was not found to exist at the .01 level. However, a significant relationship was found at the .05 level.

Motor Creativity and  
Withdrawing Tendencies

A correlation of .26 was found between motor creativity and the freedom from withdrawing tendencies component of personality. A statistically significant relationship was found to exist at the .01 level.

Motor Creativity and  
Nervous Symptoms

A correlation of .23 was found between motor creativity and the factor of being free from nervous symptoms. This was not statistically significant at the .01 level, but was significant at the .05 level.

Motor Creativity and  
Social Standards

A correlation of .22 was found between motor creativity and social standards. A statistically significant relationship was not found to exist at the .01 level. There was a statistically significant correlation at the .05 level.

Motor Creativity and  
Social Skills

A correlation of .32 was found between motor creativity and social skills. This correlation was found to be statistically significant at the .01 level.

Motor Creativity and  
Anti-social Tendencies

A correlation of .28 was found between motor creativity and freedom from anti-social tendencies, which showed a statistically significant relationship at the .01 level.

Motor Creativity and  
Family Relations

A correlation of .18 was found between motor creativity and the family relations of the subjects. This correlation was not statistically significant at either the .01 or the .05 level.

Motor Creativity and  
School Relations

A correlation of .19 was found between motor creativity and the school relations of the subjects. This correlation was not statistically significant.

Motor Creativity and  
Community Relations

A correlation of .16 was found between motor creativity and community relations. This correlation was not significant.

Motor Creativity and  
Personal Adjustment

A correlation of .37 was found between motor creativity and the personal adjustment of the subjects. This showed a statistically significant correlation at the .01 level.

Motor Creativity and  
Social Adjustment

A correlation of .63 was found between motor creativity and social adjustment. This showed a statistically significant correlation at the .01 level.

Motor Creativity and  
Total Adjustment

A correlation of .47 was found between motor creativity and total adjustment. This showed a statistically significant correlation at the .01 level.

STATISTICAL DIFFERENCES OF PERSONALITY ADJUSTMENT  
BETWEEN HIGH AND LOW MOTOR CREATIVITY GROUPS

The subjects were divided into two extreme groups. The subjects who scored in the upper twenty-five per cent of the motor creativity test represented group A while the subjects who scored in the lower twenty-five per cent of the motor creativity test represented group B. The  $t$ -test was employed to determine if there were statistically significant differences in personal, social, and total adjustment between the means of group A and group B.

Differences between Group A and  
Group B in Motor Creativity

Group A consisted of subjects who scored in the top twenty-five per cent on the motor creativity test, and group B consisted of subjects who scored in the bottom twenty-five per cent. There were twenty-seven subjects in group A and twenty-nine in group B. The mean on the creativity tests for group A was 50.851 with a standard deviation of 6.7. The mean on the creativity tests for group B was 10.241 with a standard deviation of 4.5. A  $t$  of 28.804 was found which showed a statistically significant difference at the .01 level. With fifty-four degrees of freedom, a  $t$  of 2.68 was necessary to be statistically significant at the .01 level. Thus, the two groups were considered significantly different for analysis. Table 2 shows the comparisons of the high and low groups in motor creativity.

Table 2

Comparisons of the High and  
Low Groups in Motor Creativity

Groups	N	Mean	S.D.	t	Level of Significance
Group A (High)	27	50.851	6.7	28.804	.01
Group B (Low)	29	10.251	4.5		

A  $t$  of 2.68 was needed for significance at the .01 level with 54 degrees of freedom.

Differences between Group A and Group B in Personal Adjustment

Group A had a mean of 66.222 with a standard deviation of 11.13 on the personal adjustment scale. Group B had a mean of 51.517 with a standard deviation of 16.32 on the personal adjustment scale. A  $t$  of 3.962 was found, which was significantly different at the .01 level. Thus, the high and low groups did differ significantly in personal adjustment. Table 3 shows the comparisons of the high motor creativity group with the low motor creativity group in personal adjustment.

Table 3

Comparisons of the High and Low Groups in Personal Adjustment

Groups	N	Mean	S.D.	t	Level of Significance
Group A (High)	27	66.222	11.13	3.9625	.01
Group B (Low)	28	51.517	16.32		

A  $t$  of 2.68 was needed for significance at the .01 level with 54 degrees of freedom.

Differences between Group A and Group B in Social Adjustment

Group A had a mean of 66.740 with a standard deviation of 12.56 on the social adjustment scale. Group B had a mean of 54.413 with a standard deviation of 12.11

on the social adjustment scale. A  $t$  of 3.7343 was found, which was a significant difference at the .01 level of confidence. Therefore, the high and low groups were found to differ significantly in social adjustment. Table 4 shows comparisons of the high motor creativity group with the low motor creativity group in social adjustment.

Table 4  
Comparisons of the High and  
Low Groups in Social Adjustment

Groups	N	Mean	S.D.	t	Level of Significance
Group A (High)	27	66.740	12.56	3,7343	.01
Group B (Low)	29	54.413	12.11		

A  $t$  of 2.68 was needed for significance at the .01 level with 54 degrees of freedom.

Differences between Group A and Group B in Total Adjustment

Group A had a mean of 132.962 with a standard deviation of 20.93 in total personality adjustment. Group B had a mean of 105.931 with a standard deviation of 25.57 in total personality adjustment. A  $t$  of 4.3416 was found between groups A and B in total personality adjustment. The groups showed a statistically significant difference at the .01 level. Thus, the high and low motor creativity groups were found to differ

significantly in total adjustment. Table 5 shows the comparisons of the high motor creativity group with the low motor creativity group in total adjustment.

Table 5  
Comparisons of the High and  
Low Groups in Total Adjustment

Groups	N	Mean	S.D.	t	Level of Significance
Group A (High)	27	132.962	20.93	4.3416	.01
Group B (Low)	29	105.931	25.57		

A  $t$  of 2.68 was needed for significance at the .01 level with 54 degrees of freedom.

## Chapter 5

### FINDINGS, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The general purposes of this study were to investigate the relationship between motor creativity and certain personality characteristics and also to investigate the difference in personality between subjects ranking high and those ranking low in motor creativity.

Wyrick's Motor Creativity Test and the California Test of Personality were given to 109 eighth grade girls enrolled in physical education at West Junior High School in Leavenworth, Kansas during the 1970-71 school year.

Data was analyzed by means of the Pearson Product Moment Correlation Coefficients between Wyrick's Motor Creativity Test results and the personality scales of the California Test of Personality. A second procedure involved use of the  $t$ -test to determine differences between means of the high and the low motor creativity groups in personality.

### FINDINGS

The findings of this study were as follows:

1. A significant relationship at the .01 level



was found to exist between motor creativity and the personality components of self-reliance, sense of personal worth, freedom withdrawing tendencies, social skills, and freedom from anti-social tendencies.

2. A lesser significant relationship at the .05 level was found between motor creativity and the personality components of sense of personal freedom, feeling of belonging, nervous symptoms, and social standards.

3. Three personality components failed to show significant relationships with motor creativity. These were family relations, school relations, and community relations.

4. Significant relationships at the .01 level were found between motor creativity and the three major personality components of the California Test of Personality. A significant relationship was found between motor creativity and personal adjustment, social adjustment, and total adjustment.

5. The greatest relationship motor creativity had with any one personality component was with self-reliance, or one's ability to do things independently of others.

6. The personality component that had the least amount of relationship with motor creativity was community relations.

7. There was a significant difference between high and low motor creativity groups in personal adjustment at the .01 level.

8. There was a significant difference between high and low motor creativity groups in social adjustment at the .01 level.

9. There was a significant difference between high and low motor creativity groups in total adjustment at the .01 level.

10. The high motor creativity group was consistently higher in personal, social, and total adjustment than the low motor creativity group.

#### DISCUSSION OF FINDINGS

According to the findings of this study, it appears that there are certain personality characteristics identifying students who have creative potentials in movement. Although there is some uncertainty as to the effectiveness of one personality inventory in predicting creative talent, a suggested list of characteristics, which creative individuals have, may be of help in stimulating further research. As a result of this study, the following characteristics are offered as personality characteristics of creative students in movement.

They are independent. Creative students generally are self-reliant and independent in that they can direct

their own activities without much outside motivation. Weisberg and Springer (46), Torrance (46), and Hammer (46), in their studies also stated that creative people are characterized as being independent.

They have a high sense of personal worth. They appear to feel they are well regarded by others. They may feel that they possess better than average ability to achieve success. They feel more capable of attacking a problem and have more self-confidence in getting out and trying new and different movements. Torrance (46) and Weisberg and Springer (46) also listed a sense of personal worth as a creative characteristic.

They have a tendency toward feeling that they have a certain sense of personal freedom. This would seem to be an important characteristic of creative students. However, the correlation was not as high as one might expect. This may be due to a failure of the personality test to measure this component accurately. A creative individual must be free to be himself and not have to feel any unreasonable restrictions. Torrance (46) also listed this characteristic.

They have a sense of belonging. They generally feel that they are well regarded by their family, friends, teachers, and people in general. Because they have close relationships with people they are less likely to have to worry about these relationships. They do not have to

worry about anyone laughing or making fun of them when they are trying something new and different.

They are free from withdrawing tendencies. They are able to face up to the facts of life rather than escaping to the superficial joys of a fantasy world. They are free from loneliness and self-concern. Because they can attack a problem realistically, they are more likely to accomplish success. With success comes a greater willingness to experiment and try new things. Torrance (46) made different conclusions in stating that creative people are somewhat withdrawn.

They are free from nervous symptoms. Nervous symptoms are actually physical expressions of emotional conflicts. Emotional stability appears to be a characteristic of creative students. If they are free from emotional problems, they are more likely to feel more free in exhibiting creative movements. Hammer (46) stated that creative adolescents have a fuller range of emotional expression.

They recognize desirable social standards and possess certain social skills. Creative students generally respect the rights of others, show a liking for people, and could be considered diplomatic in dealings with both friends and strangers. They are usually interested in the problems and activities of their friends. Rivlin (31) made the same conclusions in stating that creative

students are more sociable, more confident in their relationships with people, and more popular than non-creative students.

They are free from anti-social tendencies. The creative student does not have to get his way by bullying, quarreling, or disobedience. Because they are described as popular, sociable, and diplomatic, they do not have to resort to anti-social or negative behavior to get what they want. They are independent enough to work out their problems without hurting others.

They may not have particularly well-adjusted family relationships. This idea was also supported by Torrance (46). There was a low correlation between motor creativity and family relations.

In general, creative children appear to be more totally well-adjusted, personally and socially. This could be due to the fact that such people are happier, more secure, have fewer problems, and are, therefore, less inhibited in creating movements.

This list contains personality characteristics that creative students apparently possess according to the results of the study. However, certain procedural limitations must be recognized. Some of these are: the possibility of a subject learning of the nature of the motor creativity test before administration; limitations of a paper-and-pencil personality test; and possible

teacher bias or influence. Thus, there could be some discrepancy in the actual measurement of personality and motor creativity.

Some characteristics may be more vital to creativity than others. Also, there may have been some discrepancies between the way they are and the way they would like to be on the personality inventory. This discrepancy may have acted to inhibit the creative production of the non-creative student, while it may have stimulated the creative individual.

The results of this study have great significance for the physical educator. With the emphasis that is being placed upon creative movement education, teachers are going to have to learn to identify and understand creative students. As seen from this study and others, analysis of personality characteristics may be the most important method of locating creative students. After such students are identified, they must be carefully guided so that the creative student can achieve success.

Not only can personality characteristics be helpful in identifying creative students, but they can also be of value in finding those who are not creative. By giving the non-creative child experiences in which he is free to be himself and to experiment with movement, there is strong evidence that creativity can be increased through careful guidance of the teacher.

The significance of these findings could also be observed from another angle. With high correlations between motor creativity and personality characteristics, personal and social adjustment can be improved through creative movement experiences. If an individual's creative abilities can be improved, then it seems likely that personality adjustments can also be improved.

### CONCLUSIONS

In order to answer the general purposes of the study, it was concluded that, within the limits of this study, relationships do exist between motor creativity and certain personality characteristics. Creative students differ from non-creative students in personality.

More specifically, it was concluded that:

1. There is a significant relationship between motor creativity and the following personality components: self-reliance, sense of personal worth, feeling of belonging, sense of personal freedom, freedom from withdrawing tendencies, freedom from nervous symptoms, social standards, social skills, and freedom from anti-social tendencies. Students who rank high in motor creativity are more likely to have these characteristics than students who rank low in motor creativity.

2. There is no relationship between motor creativity and the following personality components: family relations, school relations, and community relations. These factors appear to be unimportant in distinguishing students who are creative from students who are not creative in movement.

3. There is a significant relationship between motor creativity and personal, social, and total personality adjustment.

4. Students who are high in motor creativity generally have a better degree of personal and social adjustment than students who are low in motor creativity. The creative students are characterized by having a higher degree of personal and social security than the non-creative subjects.

5. Students who are high in motor creativity generally are better totally adjusted than students who are low in motor creativity. The creative students are more able to meet their personal and social problems than are the less creative students.

6. Personality tests, such as the California Test of Personality, can be valuable instruments in locating and identifying students who have creative talents in physical education.



## RECOMMENDATIONS

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

1. Studies comparing other mental and physical attributes with motor creativity are recommended.
2. Further studies into the personality characteristics of subjects high in motor creativity are needed. A vast number of personality testing procedures could be given to select subjects.
3. A study to determine if creative movement education could change a person's or a group's personality characteristics is recommended.
4. Studies to determine the effect that creative movement education has on motor creativity test scores are recommended.
5. There needs to be an emphasis upon the more creative aspects of physical education.

**During the scanning  
process of this Thesis  
the following pages  
were found missing:**

**Title page, i, iv, 2, 8, 72**

12. Flanagan, Lanie. "A Study of Some Personality Traits of Different Physical Ability Groups," Research Quarterly, XXII (October, 1951), 312-323.
13. Frabony, Rena R. "An Investigation of the Relationship between Motor Ability, Interest in Participation in Physical Activity, and Personal-Social Adjustment of Girls in Adolescence." Unpublished Master's thesis, University of California, 1956.
14. Gaier, Eugene. "Creativity, Intelligence, and Achievement in Motor Skills," Theory into Practice, V (October, 1966), 190-193.
15. Getzels, Jacob W. and Philip W. Jackson. Creativity and Intelligence. New York: John Wiley & Son, INC., 1962.
16. Gowan, John C., George D. Demos, and E. Paul Torrance (eds.). Creativity: Its Educational Implications. New York: John Wiley & Sons, Inc., 1967.
17. Guilford, J.P. "Creativity," American Psychologists, XV (May, 1950), 444-454.
18. Haefele, John W. Creativity and Innovation. New York: Reinhold Publishing Corporation, 1962.
19. Havighurst, Robert J. and Hilda Taba. Adolescent Character and Personality. New York: John Wiley & Sons, 1949.
20. Hays, Joan. "Exercises for Creativity," Journal of Health, Physical Education, and Recreation, XL (November, 1969), 43-45.
21. Herink, Reinhard. Statistics. New York: Monarch Press, Inc., 1965.
22. Jackson, J. "The Relative Effectiveness of Paper-pencil Test, Interview, and Ratings as Techniques for Personality Evaluation," Journal of Social Psychology, XXIII (February, 1946), 35-54.
23. Keogh, Jack. "Relationship of Motor Ability and Athletic Participation in Certain Standardized Personality Measures," Research Quarterly, XXX (December, 1959), 438-445.

24. Lareau, Jeanne D. "The Relationship between Athletic Competition and Personal and Social Adjustment in Junior High School Girls." Unpublished Master's thesis, University of California, 1956.
25. Merriman, J. Burton. "Relationship of Personality Traits to Motor Ability," Research Quarterly, XXXI (May, 1960), 163-173.
26. Mooney, Ross L., and Taber A. Razik (eds.). Explorations in Creativity. New York: Harper & Row, 1967.
27. Parnes, Sidney J., and Harold F. Harding (eds.). A Source Book for Creative Thinking. New York: Charles Scribner's Sons, 1962.
28. Peterson, Sheri, Jerome Weber, and William W. Trousdale. "Personality Traits of Women in Team Sports vs. Women in Individual Sports," Research Quarterly, XXXVIII (December, 1967), 686-690.
29. Philipp, Joan A. "Comparison of Motor Creativity with Figural and Verbal Creativity, and Selected Motor Skills," Research Quarterly, XL (March, 1969), 163-173.
30. Rhodes, Mel. "An Analysis of Creativity," Phi Delta Kappan, XLII (April, 1961), 305-310.
31. Rivlin, Leanne G. "Creativity and the Self-Attitudes and Sociability of High School Students," Journal of Educational Psychology, L (August, 1959), 147-152.
32. Runyon, Richard P., and Audrey Haber. Fundamentals of Behavioral Statistics. Reading: Addison-Wesley Publishing Co., 1967.
33. Schendel, Jack. "Psychological Differences between Athletes and nonparticipants in Athletics at Three Educational Level," Research Quarterly, XXXVI (March, 1965), 52-67.
34. Slusher, Howard S. "Personality and Intelligence Characteristics of Selected High School Athletes and Non-athletes," Research Quarterly, XXXV (December, 1964), 539-545.

35. Smith, Hope M. "Creative Expression and Physical Education," Journal of Health, Physical Education, and Recreation, XXXIII (May, 1962), 38-39.
36. Sperling, Abraham. "The Relationship between Personality Adjustment and Achievement in Physical Education Activities," Research Quarterly, XIII (October, 1942), 351-363.
37. Strang, Ruth. "Developing Creative Powers of Gifted Children," Creativity of Gifted and Talented Children. Columbia University: Bureau of Publications, 1959.
38. Stroup, F., and N.L. Pielstick. "Motor Ability and Creativity," Perceptual and Motor Skills, XX, (1965), 76-78.
39. Taylor, C.W. (ed.). Creativity: Progress and Potential. New York: McGraw-Hill, 1964.
40. Taylor, Calvin, and Frank Barron (eds.). Scientific Creativity: It's Recognition and Development. New York: John Wiley & Sons, 1963.
41. Thomas, Carolyn E. "A Comparison of the Verbal Creativity of Highly and Average Skilled College Women Dancers and Highly and Average Skilled College Women Athletes." Unpublished Master's thesis, University of Washington, 1967.
42. Thorpe, Louis P., and Willis W. Clark, and Ernest W. Tiegs. Manual California Test of Personality. Monterey: California Test Bureau/A Division of McGraw-Hill Book Co., 1953.
43. \_\_\_\_\_. "The California Test of Personality," Journal of Educational Research, XXXV (October, 1941), 102-108.
44. Tillman, Kenneth. "Relationship between Physical Fitness and Selected Personality Traits," Research Quarterly, XXXVI (December, 1965), 483-489.
45. Torrance, E. Paul. Education and the Creative Potential. Minneapolis: The University of Minnesota Press, 1963.
46. \_\_\_\_\_. Guiding Creative Talent. Englewood Cliffs: Prentice-Hall, 1962.

47. Torrance, E. Paul. "Seven Guides to Creativity," Journal of Health, Physical Education, and Recreation, XXXVI (April, 1965), 26-27.
48. Ulrich, Celeste. The Social Matrix of Physical Education. Englewood Cliffs: Prentice-Hall, 1968.
49. Weber, Robert J. "Relationship of Physical Fitness to Success in College and to Personality," Research Quarterly, XXIV (December, 1952), 471-474.
50. Wilson, Philip K. "Relationship between Motor Achievement and Selected Personality Factors of Junior and Senior High School Boys," Research Quarterly, XL (December, 1969), 841-844.
51. Withers, M.R. "Measuring the Creativity of Modern Dancers." Unpublished Master's thesis, University of Utah, 1960.
52. Wyrick, Waneen. "Comparison of Motor Creativity with Verbal Creativity, Motor Ability, and Intelligence," Unpublished Doctor's dissertation, University of Texas, 1966.
53. \_\_\_\_\_. "The Development of a Test of Motor Creativity," Research Quarterly, XXXVI (October, 1968), 756-765.

## APPENDIX A

### REVISED DIRECTIONS FOR MOTOR CREATIVITY TESTS\*

This is a group of three tests to see how many ways you can solve different movement problems. You will have three minutes in which to respond to each movement problem. You will show your answer to me by moving however you wish. You should feel free to try any movements that you feel will solve the movement problem. Errors, accuracy, or form are not important and will not be recorded. Please do not discuss the test with anyone.

#### I. Parallel Line Test

Move in as many different ways as you can from this line to the other line, so that at some point in your movement you include a twisting or turning movement. Begin at line one and perform a movement that has a turn or a twist in it at some point until you reach line two. Upon reaching line two, return to line one with a different turning or twisting movement until the time is consumed. Do you have any questions? Ready? Begin.

## II. Ball-Wall Test

Move a ball to the wall in as many different ways as you can, either by striking or batting the ball. It makes no difference where on the wall the ball lands as long as it reaches the wall. Be sure to strike or hit the ball in a different way each time. You may not go over the line in front of you. Accuracy is not important. Keep moving the balls to the wall until the time is up. Do you have any questions? Ready? Begin.

## III. Hoop Test

Pick the hoop up from the floor in as many different ways as you can. The entire hoop does not have to leave the floor in order to count as picked up. When you have gotten all or most of the hoop off the floor, you may replace it and show me a different method of picking it up. Keep picking the hoop up and replacing it until the time is up. Do you have any questions? Ready? Begin.

\*Revised from directions for Wyrick's Motor Creativity Test (52).



## APPENDIX B

## INDIVIDUAL SCORING SHEET

Student Number \_\_\_\_\_ Age \_\_\_\_\_ Date \_\_\_\_\_

TEST ITEMSI. Parallel Line Test

- |    |     |
|----|-----|
| 1. | 9.  |
| 2. | 10. |
| 3. | 11. |
| 4. | 12. |
| 5. | 13. |
| 6. | 14. |
| 7. | 15. |
| 8. | 16. |

Score \_\_\_\_\_

II. Ball-Wall Test

- |    |     |
|----|-----|
| 1. | 9.  |
| 2. | 10. |
| 3. | 11. |
| 4. | 12. |
| 5. | 13. |
| 6. | 14. |
| 7. | 15. |
| 8. | 16. |

Score \_\_\_\_\_

III. Hoop Test

- |    |     |
|----|-----|
| 1. | 9.  |
| 2. | 10. |
| 3. | 11. |
| 4. | 12. |
| 5. | 13. |
| 6. | 14. |
| 7. | 15. |
| 8. | 16. |

Score \_\_\_\_\_

TOTAL SCORE \_\_\_\_\_

## APPENDIX C

**Personal, Social, and Total Adjustment  
Raw Scores of Subjects Ranking in Top  
Twenty-five Per Cent of Motor Creativity Scores**

<b>Motor Creativity Score</b>	<b>Personal Adjustment Score</b>	<b>Social Adjustment Score</b>	<b>Total Adjustment Score</b>	<b>Student Number</b>
61	73	79	142	29
60	48	48	96	93
59	76	78	154	88
59	72	76	148	84
58	70	64	134	90
57	67	73	140	91
57	66	73	139	79
56	61	76	137	89
55	59	40	99	98
55	53	69	122	82
55	73	58	131	81
55	84	79	163	59
54	69	74	143	83
52	69	73	142	37
51	73	80	153	72
51	36	63	99	30
49	68	74	142	99
47	63	43	106	85
45	64	51	115	66
45	71	64	135	12
44	63	61	124	75
44	48	63	111	20
42	82	87	169	9
41	79	77	156	70
41	50	45	95	68
40	76	78	154	54
40	75	56	131	42

## APPENDIX D

**Personal, Social, and Total Adjustment  
Raw Scores of Subjects Ranking in Bottom  
Twenty-five Per Cent of Motor Creativity Scores**

<b>Motor Creativity Score</b>	<b>Personal Adjustment Score</b>	<b>Social Adjustment Score</b>	<b>Total Adjustment Score</b>	<b>Student Number</b>
16	69	57	126	106
16	57	68	125	67
16	65	46	111	22
15	83	71	154	95
15	53	65	118	74
15	81	75	156	55
15	36	53	89	25
15	68	87	155	1
14	57	43	100	36
14	46	51	97	15
13	53	43	96	13
12	42	46	88	103
12	40	45	85	87
12	75	62	137	64
11	72	64	136	48
10	56	50	106	101
10	28	59	87	18
9	45	51	96	71
9	63	68	131	49
8	43	50	93	39
7	43	48	91	110*
7	62	71	133	63
6	25	42	67	32
5	64	50	114	73
5	38	40	78	27
4	28	45	73	86
3	29	39	68	80
3	40	39	79	47
0	33	50	83	51

\*One subject did not take both tests, thus accounting for student number 110.