A study of the relationships between teacher educational attitude and sanction of student creative behavior and student creative potential and preference for creative behavior.

Glenn A. Ray
University of Massachusetts Amherst

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A STUDY OF THE RELATIONSHIPS BETWEEN TEACHER EDUCATIONAL ATTITUDE AND SANCTION OF STUDENT CREATIVE BEHAVIOR AND STUDENT CREATIVE POTENTIAL AND PREFERENCE FOR CREATIVE BEHAVIOR

A Dissertation Presented

By

GLENN A. RAY

Submitted to the Graduate School of the University of Massachusetts in partial fulfillment of the requirements for the degree of

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June 1974

Major Subject: Education
A STUDY OF THE RELATIONSHIPS BETWEEN TEACHER EDUCATIONAL ATTITUDE AND SANCTION OF STUDENT CREATIVE BEHAVIOR AND STUDENT CREATIVE POTENTIAL AND PREFERENCE FOR CREATIVE BEHAVIOR

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June 1974
This treatise is dedicated with affection and admiration to my parents, William and Lorena Ray, whose continued existence in a racist society and the quality of their existence bear witness to the creative energies inherent in humankind in general and Black folks in particular.
ACKNOWLEDGMENTS

At various times throughout the duration of this study, many individuals offered encouragement and assistance to me. Without both, this study would not have been completed. For his sustained interest, assistance, guidance, intellectual acuity, and friendship, I am extremely grateful and indebted to the chairperson of my doctoral committee, Dr. Robert Sinclair. To members of the doctoral committee, Dr. Norma Jean Anderson, Dr. Thomas Hutchinson, and Dr. Castellano Turner, I express my sincere appreciation for their perceptive comments and guidance. Dr. Thomas Hutchinson's assistance with research procedures and data interpretation were especially invaluable.

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To Patricia Gordon, who typed the final draft, I owe a special note of thanks.

To the staff and students associated with the Living Arts Program, Dayton, Ohio from 1967 through 1971, whose uniqueness and interests in creativity inspired this study, I am eternally grateful.
A STUDY OF THE RELATIONSHIPS BETWEEN TEACHER EDUCATIONAL ATTITUDE AND SANCTION OF STUDENT CREATIVE BEHAVIOR AND STUDENT CREATIVE POTENTIAL AND PREFERENCE FOR CREATIVE BEHAVIOR

(June 1974)

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ABSTRACT

The purposes of this investigation included (1) to describe relationships, in a teacher sample, which exist between educational attitudes and sanctions of certain student behavioral characteristics; (2) to describe relationships, in a student sample, which exist between preferences for certain behaviors and creative aptitudes; and (3) to report exploratory findings of relationships between certain background information and variables associated with each sample group. Data were obtained from a selected sample population of 147 fourth grade and 156 fifth grade students and 40 fourth and fifth grade teachers from a small New England working class school district.

The first hypothesis predicted teachers whose educational attitude is more reflective of Progressivism will select more creative behavioral characteristics to be encouraged than teachers whose educational attitude
is reflective of Traditionalism. To assess teacher educational attitude, the Kerlinger Education Scale VI was used. An adaptation of the Torrance Ideal Pupil Checklist was used to assess the number of creative behavioral characteristics to be encouraged by teachers.

Using Pearson product-moment correlation procedures, scores on the Kerlinger Education Scale VI were correlated with scores on the Torrance Ideal Pupil Checklist. Calculated correlation coefficients indicated weak but significant \( p < .05 \) relationships between A scores on the Kerlinger ES-VI (Progressivism) and X scores on the TIPC (encourage most creative behavioral characteristics, discourage least creative behavioral characteristics) and between B scores on the Kerlinger ES-VI (Traditionalism) and Y scores on the TIPC (encourage least creative behavioral characteristics, discourage most creative behavioral characteristics). An unqualified acceptance of the first hypothesis could not be made, however.

The second hypothesis predicted that students who score high on creativity tests will prefer more creative behaviors than students who score low on creativity tests. The creativity tests used were the Torrance Tests of Creative Thinking, Figural Form A. To assess the number of creative behaviors students prefer, the Ray Creative Behavior Preference Inventory was developed and field tested by the investigator and administered to the sample population.

Using Pearson product-moment correlation procedures, scores on the Ray Creative Behavior Preference Inventory were correlated with scores on the Torrance Tests of Creative Thinking—Fluency, Flexibility, Originality, and Elaboration. Although the correlation coefficients produced were in the predicted direction, none were found to exist at a statistically
significant level.

Findings led to the conclusion that teachers, in the sample, whose educational attitudes are Progressive tend to think behaviors considered important for a productive creative personality should be encouraged and teachers whose educational attitudes are Traditional tend to think behaviors considered not important for creativity should be encouraged. Exploratory findings associated with the teacher data indicated a tendency for teachers in the sample who have taught longer to be more Traditional in their educational attitudes and to think characteristics not important for a creative personality should be encouraged. Further, for teachers in the sample, the more education acquired the less Traditional teachers tend to be in their educational attitudes and the less they tend to think characteristics least important for a productive creative personality should be encouraged.

Findings associated with the student sample led to the conclusion that very weak relationships exist between predicted variables but do not exist at a statistically significant level. Exploratory findings for the student sample indicated fifth grade students tend to prefer those behaviors considered least important for a productive creative personality and tend to score lower on Fluency, Flexibility, Originality, and Elaboration than fourth grade students in the sample. When differences were compared according to sex, the data indicated female students tend to prefer less those behaviors considered most important for a productive creative personality than males in the sample. Finally, the data indicated female students in the sample tend to score higher on Flexibility and Elaboration than males, a finding consistent with investigations by Torrance.
It was recommended that those responsible for teacher preparation devote considerable attention to the complex interplay between attitudes and behaviors in order to identify those attitudes and behaviors most compatible with the development of creativity. As suggested by the findings of this study, teachers with Progressive educational attitudes will be more likely to encourage those behavioral characteristics considered important for creativity than teachers with Traditional educational attitudes. It was also recommended that continuous in-service teacher programs be devoted to raising the level of awareness of what kinds of environments are conducive to creative growth, identifying teacher attitudes and behaviors nurturant of creativity, and building support systems among teachers to cope with student behaviors heretofore considered disruptive would do much in developing educational climates which enhance student creativity.
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CHAPTER I
INTRODUCTION

The torrent of criticism of the American educational system which proliferated during the decade of the sixties and early seventies carried with it a repetitious theme. Whether the author was Silberman, Kozol, Holt, or Kohl, to name just a few of the more passionate critics, the message was clear and constant. Schools are insensitive to students who are different. Much attention was focused on insensitivities resulting from differences of race, culture, or ethnicity. The nation itself began the painful process of recognizing its treatment of individuals who are racially or culturally different (making even more compelling the adage that schools, rightly or wrongly, reflect the values of the larger society).

Although energies, unfortunately, must still be devoted toward overcoming racial, cultural, and ethnic insensitivities within educational institutions, attention must also be given to other more subtle and complex differences which cause students to be dehumanized.

Foremost among other causes of the dehumanization of students are emotional and intellectual differences. The unfair and often hostile treatment of the intellectually different (retarded or advanced), for example, has, for many years, occupied a considerable maculation in the annals of American schools. Somehow, students who are different are viewed as the "problem" rather than those in the institution who serve them. Even more complex and problematic are the potentially creative students. These students are treated just as insensitively and often their very asset is thwarted by those who would espouse fostering such a quality. (In actuality, two problems exist: (1) fostering the development of
creativity in students exhibiting creative behaviors and (2) fostering the development of latent creative potential inherent in all students. This study is equally concerned with both).

Lack of understanding by educators of the phenomenon, creativity, contributes heavily to the problems encountered by the creative student. Although much has been written about creativity in recent years, many questions surrounding optimum conditions which foster its development still remain unanswered. Within educational settings, information is still needed regarding the teacher's role in fostering or inhibiting the growth of creativity. The 1970 White House Conference on Education stated, "the teacher is the instructional medium--both the medium and the message--the link between the child and the act of learning." The teacher can be seen as one who is central to providing or withholding opportunity, motivation, and reinforcement for learning. Moreover the kinds of opportunity, motivation, and reinforcement for learning the teacher provides will depend upon the teacher's own educational values and attitudes.

As more study and research is done to aid in the understanding of creativity, consistent patterns of behavior emerge as characteristic of the creative individual. Some of these behaviors, for example, rebelliousness, disorderliness, and exhibitionism that Barron cited, are behaviors which are outside the accepted behavioral norms of society. These divergent behaviors may elicit positive or negative feedback from those in the society. According to behaviorist theory, if the feedback is strong enough and continues long enough, the behavior can be extinguished (negative) or nurtured (positive). Schools can be viewed as miniature societies, with teachers exerting a strong influence on norms of acceptable behavior.
Teachers, because of their position of authority, can, to a large degree, control and define the acceptable behaviors in their own classroom. To date, we have little or no data to inform us as to the effect teachers have on reinforcing divergent behavior of students nor whether there is any relationship at all between the teacher's repertoire of "acceptable" behaviors and creativity of students in that class.

Within the broader context of teacher educational attitudes and student disposition toward certain behaviors, this study will focus on the following specific relationships and questions:

1. Assuming that all educational attitudes fall somewhere on a continuum between "traditional" and "progressive", is there a relationship between the trend or direction of these attitudes and the nature of student behaviors teachers feel should be encouraged or discouraged?

2. If, as the literature suggests, students who are creative tend to display behaviors outside the norm of society, is there a relationship between the student's score on certain creativity tests and the number of creative behaviors in which the student prefers to engage?

**Purpose of the Study**

The purpose of this study is to describe relationships between selected aspects of teacher educational attitudes and sanctions of encouragement of certain student behaviors and to further describe relationships between student behavioral preferences and creative aptitudes. Using a sample of fourth and fifth grade teachers, the investigator measures teacher educational attitudes along a continuum from Traditional to Progressive. The instrument used to gather these data is the Kerlinger Educational Scale VI. Using the Torrance Ideal Pupil Checklist, the investigator determines the number of creative behavioral characteristics teachers
believe should be encouraged. Further, with a sample of fourth and fifth grade students, the investigator measures students' level of creative potential using the Torrance Tests of Creative Thinking. Students' preference for creative behavior is ascertained by using the Ray Creative Behavior Preference Inventory. Significant relationships between level of creative potential and preference for creative behavior of students and significant relationships between teacher educational attitudes and sanctions of encouragement of creative behavioral characteristics of teachers are reported.

The following hypotheses are accepted or rejected at the .05 level of significance:

1. Teachers whose educational attitude is more reflective of Progressivism will select more creative behavioral characteristics to be encouraged than teachers whose educational attitude is reflective of Traditionalism.

2. Students who score high on creativity tests will prefer more creative behaviors than students who score low on creativity tests.

Definitions and Assumptions

Creativity. Creativity, as used in this study, is defined as a behavioral process. This behavioral process involves the combining of concepts known to an individual which yield a concept new to the individual and meets an internal need upon its completion. A closer examination of this definition will provide further clarity. First, creativity is seen as a manifestation of certain behaviors of the individual. These behavioral manifestations are both cognitive and affective functions and aptitudes. Cognitive aptitudes such as fluency and flexibility of thinking, originality, re-definition, and elaboration have been identified by Guilford. Indeed, it
is in the area of cognitive aptitudes that the bulk of research on creativity has taken place. Affective aptitudes regarding attitudes, motivation, and temperament have been much more elusive.

Second, the notion of combining concepts known to the individual refers to the background and life experiences on all levels of awareness which make up the sum and substance of raw material for creative output. The output, although it might already exist, is deemed "creative" if this combining is new to the individual. (The criteria of creative products are ultimately what the culture decides. There are those who contend that a product is only creative if it is new and useful to the society. Another contention advocates the position of this writer).

Third, the notion that the act of creating fulfills a need is felt more intuitively than known empirically, although one can logically make a case in its favor. The difficulty rests in isolating which need(s) accounts for the behavior.

Parallel to this third notion is the notion that the behavior, to be continuous, is, in some way, reinforced positively. (Perhaps one reinforcement is the meeting of a need of the individual). Behaviorists would maintain that behavior is dependent upon environmental contingencies. This contention advances the theory that the locus of reinforcement is external to the individual. This writer would advance that the locus of reinforcement can be either—external or internal—or both.

It is from this conceptualized definition that the study takes shape. Some of the assumptions which follow from this definition include the following:

a) Certain behaviors are responsible for and are a residual part of the creative act.
b) For these certain behaviors to continue, they are reinforced internally and/or externally.

c) Certain of these crucial behaviors are outside of the norms of certain systems within the culture.

d) Within the educational system, albeit expanding, there exists a norm of acceptable and "approved" behaviors.

e) Those within the educational system (teachers, administrators, etc.) participate in perpetuating the ("approved" behaviors) norm.

f) Teachers, depending upon their educational attitudes, will more or less approve of behaviors outside the accepted norm of behaviors.

g) Students who are more creative, prefer to engage in behaviors which are outside the norm—divergent behaviors.

**Divergent Behaviors.** Divergent behaviors refer to those behaviors exhibited by individuals which deviate from the norm. The behaviors are characterized by a healthy exploring, experimenting attitude rather than the pathological sense of deviation or divergent. Non-conformity, assertiveness, independence of thought and judgment, introversion, self-assertiveness are all examples of divergent behaviors as used in this study.

A review of relevant literature will support the contention that creative individuals often display divergent behaviors. One should not conclude, however, that all individuals exhibiting divergent behaviors are creative. Nor should one conclude that all divergent behaviors are creative behaviors.

**Traditionalism.** "...a generally narrow and practical (in a limited and limiting sense) educational viewpoint. Emphasis is on subject matter
for its own sake, impersonal superior-inferior relationships with considerable importance attached to the hierarchical nature of such relationships, external discipline, and conservative status-quo preserving social belief. 'Morality' is strongly emphasized and based on 'higher' authority."^5

**Progressivism.** ".....is characterized by emphasis on problem-solving and relative de-emphasis on subject matter and knowledge, education as growth, children's interests and needs as basic to education, equality and warmth in interpersonal relationships, internal discipline, liberal social beliefs which emphasize education as an instrument of social change, and morality based on social and individual responsibility."^6

**Significance of the Study**

This study will contribute valuable information toward a more thorough understanding of the phenomenon creativity. The data provided by this investigation will permit the development of more sophisticated theories of creativity and will aid in bringing into sharper focus the characteristics of the creative individual.

The relationships reported regarding teacher attitudes and the nature of student behaviors felt by teachers to be encouraged or discouraged will have import for those in both pre-service and in-service educational training. Within such training programs, a greater emphasis on the complex interplay between attitudes, values, and teacher behaviors in terms of sanctions for certain classifications of student behaviors can be justified through data provided by this and similar investigations. This emphasis will hopefully engender a greater sensitivity to the fostering of creative potential among students. The data will further suggest direction for
developing optimum conditions for enhancing creative growth in students. In addition, from the information provided, appropriate teaching practices which foster creativity in students can be inferred.

Although research into creativity has seen much activity and progress, the complexity of the subject area demands continuous and rigorous investigation. Information ascertained through this research effort will provide direction for additional investigation.

Finally, the design and field test of the Ray Creative Behavior Preference Inventory used in this study is a step toward developing additional instrumentation needed to investigate further behaviors thought to be associated with creativity.

Design of the Study

The two hypotheses stated above were generated through an examination of relevant literature, both theoretical and empirical (See Chapter II). It is suggested from the first hypothesis that a relationship may or may not exist between teacher scores on a test of educational attitudes and the number of behaviors felt should be encouraged or discouraged by teachers. The second hypothesis suggests that there may or may not exist a relationship between student scores on creativity tests and the number of creative behaviors preferred by students.

To a sample population of fourth and fifth grade teachers and students, the instruments described below are administered and the scores of these instruments subjected to Pearson product-moment correlation procedures. Specifically, the existence of a relationship between the scores of teachers on the Kerlinger Education Scale VI and the number of creative behaviors felt to be encouraged or discouraged by teachers, as ascertained by the
The ideal Pupil Checklist, is investigated. This investigation will give evidence for accepting or rejecting the first hypothesis. Similarly, the investigation of a relationship which might exist between pupil scores on the Torrance Tests of Creative Thinking and the Ray Creative Behavior Preference Inventory will produce evidence to support or dismiss the second hypothesis.

Instrumentation

This study assumes that as teachers approach a more progressive educational attitude, they will sanction the encouragement of more of the behaviors creative students prefer. It is further assumed that students who are creative prefer to engage in behaviors which are associated with creativity. These assumptions have led this investigator to utilize the following instruments for gathering data to support or reject the stated assumptions:

Teacher instrumentation related to the first assumption.

1. To assess teacher educational attitude, the Kerlinger Education Scale VI is used (See Appendix A).

2. To assess the degree to which teachers sanction the encouragement of creative behaviors, the Torrance Ideal Pupil Checklist is used (See Appendix B).

Student instrumentation associated with the second assumption.

1. To assess the level of creativity of students, the Torrance Tests of Creative Thinking, Figural Form A, is used.

2. To assess student preference for creative behavior, the Ray Creative Behavior Preference Inventory is used (See Appendix C).

The hypotheses of the study will be accepted at the .05 level of significance.

The organization of the subsequent chapters include a theoretical
background of the study and a review of relevant literature, Chapter II; a description of the size and nature of the sample population, the research procedures and instruments used in the investigation and the statistical treatment of data generated by the sample, Chapter III. Chapters IV and V include the reporting and interpretation of findings, summary, conclusions, implications, and recommendations for further investigation.
CHAPTER II
REVIEW AND THEORETICAL BACKGROUND

This Chapter seeks to provide a theoretical referent and an overview of conceptual and investigative literature pertaining to two fundamental issues. The first issue concerns certain concomitant behavioral characteristics associated with creative potential and the response these characteristics engender from peers and teachers in the classroom environment. Equally as important, is the second issue concerning the nature of attitudes and the effect certain attitudes of teachers have on the climate of the classroom in light of optimum conditions for the development of creativity within the classroom.

The first section of this Chapter will seek to present a comprehensive, though not exhaustive, cognitive and personological profile of individuals who tend to display creative behaviors, as suggested by relevant literature. The second section will examine conflicts encountered by the creative personality. The third section will examine teacher attitudes and behavior toward the creative student. The final section will review the nature of educational attitudes.

Profile of Creative Individuals

Cognitive Abilities

For many years, creativity and intelligence were viewed under the same general classification—"gifted". Individuals who were considered bright or gifted and whose I.Q. measurements indicated high intellectual acumen were assumed to be highly creative as well. Little distinction was made between creativity and intelligence except as one might associate
creativity with "giftedness in the arts." However, in 1950, J.P. Guilford, by means of factor analysis, identified several distinct cognitive abilities associated with creativity. Guilford classified these distinct abilities under those associated with divergent thinking, one of five operations contained in his theoretical model called the Structure of Intellect. Divergent thinking is described as producing "a variety of ideas," as contrasted with convergent thinking in which "the conclusion is completely determined by the given information, or at least there is a recognized best or conventional conclusion." Divergent thinking is the operation associated with creative thinking and convergent thinking that operation associated with logical thinking, according to Guilford.

The six cognitive abilities identified by Guilford include (1) sensitivity to problems; (2) thinking fluency; (3) thinking flexibility; (4) originality; (5) elaboration; and (6) re-definition. Sensitivity to problems refers to one's ability to be cognizant of problems that require solutions. This heightened sensitivity also compels the individual to work on the problem and is a source of motivation. Thinking fluency refers to one's ability to think of solutions in quantity and rapidly. Further investigation in this area identified four fluency factors (Wilson, Guilford, et al., 1954): a) word fluency; b) ideational fluency; c) associational fluency; and d) expressional fluency. Thinking flexibility refers to one's ability to discard habitual modes of solving problems. Guilford distinguishes between spontaneous flexibility and adaptive flexibility. In the former, the individual is flexible as a mode of operating naturally and in the latter, the individual is flexible when the solution requires it. Originality refers to one's ability to come up with clever, uncommon, or
remote answers to problems. Elaboration refers to one's ability to supply detail to scant outlines. And, Re-definition refers to one's ability to transform the meaning and function of one object to another. Although these abilities were first identified with an adult population, subsequent investigation by Guilford and Hoepfner verified these same abilities with students at the ninth grade level. Further investigation by Merrifield, Guilford, and Gershon and by Lauritzen identified similar abilities at the sixth and fifth grade level respectively.

The evidence to date suggests that abilities identified by Guilford are, indeed, abilities associated with those necessary for creative production. One must conclude, however, that these abilities are not comprehensive and more work is needed to explore and identify other abilities.

Personality Characteristics

In a study conducted by Cattell and Drevdahl of creativity in the scientific field, which included a population of 46 research physicists, 46 research biologists and 52 researchers in psychology, it was reported that this group was more serious, intelligent, dominant, inhibited, emotionally sensitive, radical, and given to controlling their behavior by an exacting self-concept than the general population.

In another investigation by Cattell and Drevdahl using a population of 153 creative writers and artists taken from Who's Who in American Art, the authors state that the profiles "by any pattern similarity coefficient (an index designed to express over-all similarity between two profiles), would definitely be placed in the same family as the profiles of the creative scientists." MacKinnon, who has done extensive research on creative individuals at the Institute of Personality Assessment in California, found that highly
creative architects were self-confident, aggressive, flexible, self-accepting, little concerned with social restraints or other's opinions, and strongly motivated to achieve primarily in those situations where independent thought and action, rather than conformity, were required. Further investigation by MacKinnon revealed this group's perceptiveness, intuitiveness, and introversion, and though they indicated little desire to be included in group activities, which attested again to their introverted nature, they demonstrated marked social poise, dominance, a desire to control others when they did interact.11 Investigation by Gough (1961) confirmed MacKinnon's findings.12

In a report delivered to the Fifth Association for Supervision and Curriculum Development Research Institute in December, 1959, Taylor posited a tentative description of the creative individual from existing research. Taylor stated,

Some evidence to date on personality characteristics suggests that creative persons are more devoted to autonomy, self-sufficient, more independent in judgment (contrary to group agreement, if needed, to be an accurate judge), more open to the irrational in themselves, more stable, and more capable of taking greater risks in the hope for greater gains, more feminine in interests and characteristics (especially in awareness of one's impulses), more dominant and self-assertive, more complex as a person, more self-accepting, more resourceful and adventurous, more radical (bohemian), more controlling of their own behavior by self-concept, and possibly more emotionally sensitive, and more introverted but bold.13

Guilford, arriving at a similar conclusion regarding characteristics of the creative individual, maintains,

There is general agreement that the highly creative person, particularly the original person, is self-confident. . . along with self-confidence, there is usually self-assurance or social boldness. The
creative person is especially confident about his
own judgment and his own evaluations of his work.
He is often described as an independent thinker,
which includes having an independent set of values. . .14

Guilford further adds that because of a high degree of self-sufficiency,
the creative person is constantly in danger of "becoming estranged from
his parents, his teachers, and his peers."15

Dellas and Gaier, commenting on the similarities in personological
traits "despite the various approaches and heterogeneity of instruments
used," maintain that consistent patterns emerge which describe the crea-
tive individual.

Independence, manifested not only in attitudes but
also in social behavior, consistently emerged as
being relevant to creativity, as did dominance,
introversion, openness to stimuli, and wide
interests. Self-acceptance, intuitiveness, and
flexibility also appeared to characterize the
creatives, and though they had social presence
and poise, they exhibited an asocial attitude
and an unconcern for social norms. This may re-
fect antipathy toward anything encroaching on
individuality or compelling conformance.16

From numerous investigations cited by Dellas and Gaier, the authors
conclude that "highly creative students have personality structures that
are congruent to--but possibly less sharply delineated than--those of the
mature recognized creatives."17 Because of such a high rate of congruency,
the authors feel it at least tenable to conclude "that these traits develop
fairly early. Their manifestation at this level suggests that these
characteristics may be determinants of creative performance rather than
traits developed in response to recognition of creative behavior."18

The cognitive and personological characteristics of the creative
individual described from consistent patterns of characteristics found
throughout the literature provide a substantive profile of such individuals
more tenable than mere armchair speculation. In summarizing this profile,
It can be stated that creative individuals possess high abilities in their sensitivity to problems, thinking fluency and flexibility, originality, elaboration, and re-definition. The creative individual also possesses a high sense of "self" which is manifested in the creative individual's being more self-sufficient, independent in thought and judgment, self-assertive, confident, resourceful, dominant, and aggressive than the general population. In addition, the creative individual often displays behaviors which are non-conforming, radical, and at times, seemingly irrational. The above characteristics presents the creative individual as an extremely complex dynamic personality which cannot be ignored.

Conflicts Encountered by the Creative Personality

Aggression, non-conformity, independence in thought and judgment are behavioral characteristics which cause many problems for creative individuals in educational settings. For students, these problems center on difficulties in interpersonal relationships with teachers and peers. More and more evidence suggests that the development of creativity "is not purely a curriculum matter, but depends upon interpersonal relationships." The quality of interpersonal relationships between creative individuals and their teachers and peers may often be the difference between continued development or conscious suppression of creative tendencies. Travers maintains much evidence supports the assertion that the social relations among the students as a group and between the students and the teacher significantly influence the quality of the classroom social climate which, in turn, influences the cognitive and affective learning outcomes.

Although there is conflicting evidence supporting the notion that creative individuals are the least popular in a group, data supporting
friction in peer relationships between creative individuals and their peer group members seems consistent. Pepinsky found that organizations or groups will endure and even reward "a few, but not too many" individuals who do not conform to the established standards. Apparently the number depends upon the extent to which the creative minority constitutes a disturbing challenge to entrenched beliefs, vested interests, "duly constituted authority, and the accepted way of life."21 Taylor, commenting on some of the findings in the Minnesota Studies of Creativity conducted by E.P. Torrance, et al., submits that often one can identify the creative in a group by

...watching the reactions of others around a person. If some persons in a group appear excited, disturbed, or threatened, perhaps there is a creative person around whose ideas and work are being at least vaguely sensed as threatening the present scheme of things. 22

Torrance found that the techniques groups use to control creative members include "open aggression and hostility, criticism, rejection and/or ignoring, the use of organizational machinery to limit scope of operation and to impose sanctions, exaltation to a position of power involving 'paper work' and administrative responsibility. ..."23 Torrance further found that creative individuals counter these techniques by "compliance, counter-aggressiveness, indomitable persistence, apparent ignoring of criticism, clowning, silence and apathy or preoccupation, inconsistent performance, filling the gaps when others falter, solitary activity. ..."24

The quality of peer relationships is one variable which contributes toward the kind of educational environment conducive toward the development of creativity. If creative individuals are constantly criticized, rejected, or ignored by their peers, the pressure "to be like the gang"
will eventually take its toll. Unless positive reinforcements are evident from alternative sources within the educational setting, creative individuals will likely become deferent, apathetic, hostile, or display other disrated social behaviors which will only serve to exacerbate the problem.

The Teacher and the Creative Student

One alternative source of reinforcement and another variable contributing toward a climate which fosters creativity in educational settings is the behavior of the teacher toward creative students who display divergent behaviors—or behaviors outside the norm, e.g., aggression, non-conformity, independence in thought and judgment. Because the role of the teacher is central to the educational process and a central force determining the climate within a given classroom as well as the range of "acceptable behavior," considerable attention must be devoted to this very important variable. This section will therefore examine the acceptance of creative students by teachers; the attitudes of teachers toward creative students; and the nature of educational attitudes and how these attitudes may affect the climate of the classroom.

Investigation has long since passed on the inquiry stage of whether there is a causal relationship between the beliefs, attitudes, behaviors, and preferences of teachers and the achievement, beliefs, attitudes, motivations and behaviors of students. We have come to accept as fact that "school is more than a place where academic skills are taught and learned; it is a miniature community in itself where members interact and influence the behavior of each other." Rather, a more sophisticated level of inquiry is attempting now to determine which antecedents affect which
consequence.

Depending upon the maturity level of the student, the sanctions of the teacher are as equal to or greater than peer sanctions in importance to the student and are second only to the influence exerted by the student's own immediate family. The acceptance or rejection of students by teachers can have a profound influence on the development of students. It has been further asserted that "the attitudes, prejudices, needs, and conflicts which teachers have are reflected in their behavior and influence strongly the social growth of exceptional children." If teachers do prefer certain characteristics to others in students, how does the creative student compare with students of other characteristics?

In a study by Getzels and Jackson of the highly intelligent and highly creative adolescent, one question addressed was "Which of the two groups was preferred by teachers?" It was found that "even though their academic performance, as measured by achievement tests, is equal, the high-I.Q. student is preferred over the average student, whereas the high-creative student is not." The authors also found a negative correlation between the personal qualities creative students prefer for themselves and the personal qualities they believe teachers prefer for them. There existed a high positive correlation on the same two variables for high-I.Q. students. These data suggest that not only are highly creative students preferred less by teachers, there exists, between highly creative students and teachers, much disparity regarding personal qualities students should have. The authors state,

If the desirability of students in the classroom is related to the congruence or discrepancy between their values and their teacher's values, then in the
light of the above data it is hardly surprising that our high-I.Q. students are favored by teachers more than are our creative students.  

Torrance, investigating student personality characteristics teachers felt should be encouraged and discouraged which would represent the "ideal" pupil, added further evidence that characteristics and behaviors creative students are likely to display find much disfavor with teachers. From a list of 62 characteristics, teachers and parents in the United States ranked being considerate of others as the most important of the list. A characteristic quite unlikely to be found in great abundance in creative individuals. Torrance says,

This great stress on being considerate of others certainly identifies one of the reasons why teachers do not prefer highly creative pupils. Research indicates that highly creative people frequently appear to be lacking in this trait.  

The over emphasis on conformity reflected by the high importance given this characteristic points again to the disparity between the values of teachers and the values needed to truly foster creativity in students. Another revealing value expressed by teachers in Torrance's study was the characteristic ranked lowest or least important—disturbing existing organization. This value suggests that behaviors characterized by disturbing existing organization is disruptive and disfavored by teachers who would value structure and behavior conforming to the established ways of doing things. Torrance, commenting on this lowest ranked characteristic, says,

I believe that this is an essential characteristic of the creative thinker and that if we are to free the creative thinking abilities to develop we must learn how to accept it, guide it in productive directions, and exploit its values for stimulating learning and thinking in the classroom.
In addition to considering the disfavor of teachers experienced by creative students, it is also necessary to examine the nature of attitudes, and how certain educational attitudes may cause the classroom environment to be nurturant or hostile to creative development.

There is much controversy regarding the degree to which attitudes result in behaviors manifesting those attitudes. Even if it were possible to resolve the controversy, a discussion of the magnitude required to accomplish this would be inappropriate given the stated purposes of this Chapter. Until all the evidence is in, subscription to either side of the issue is of little consequence. What is important, within the context of this discussion, is that the position subscribed to be made clear.

This writer subscribes to the concept of attitude advanced by Krech, et al., which proposes to divide the construct attitude into three components--affects (or emotions), cognitions (or beliefs or opinions), and action tendencies. A complimentary definition of attitude to which this writer also subscribes is offered by Oppenheim who defines an attitude as, a state of readiness, a tendency to act or react in a certain manner when confronted with certain stimuli. Attitudes are reinforced by beliefs (the cognitive component) and often attract strong feelings (the emotional component) that will lead to particular forms of behavior (the action tendency component). Most of the time we perceive attitudes as straight lines, running from positive, thru neutral, to negative feelings about the object or issue in question.

An attitude has intensity. It may be held with greater or lesser vehemence... attitudes are highly emotional both in the sense of irrational or illogical and in the sense of arousing powerful needs and ego defenses.

The theory advanced by Krech and the definition submitted by Oppenheim serve as referents to the position taken by this writer that the beliefs,
opinions, and attitudes a teacher may have regarding the educational process combined with the teacher's own value system causes the teacher to behave in certain predictable ways toward students. The teacher's preconceived beliefs or opinions (based on whatever background source) of "gifted" students, or "creative" students, or the "ideal" student reinforce the attitudes teachers have about these students. Combined with strong emotional feelings, attitudes compel action based on these attitudinal references.

Although there is no plethora of compelling evidence to support the above assertion, there is, however, much evidence to suggest educational attitudes of teachers become expressed in the classroom and have a significant effect on students. The following investigations lend support to the assertion that teachers' attitudes affect the classroom climate and the students.

Investigations by Lippitt and White and by Anderson and his colleagues, as reported by Evans, indicate clearly that the attitudes of teachers toward students have a considerable effect on classroom relations. Discussing the investigations, the author maintains,

Where the teacher was autocratic or dominating, the children were likely to be aggressive or over-submissive. They showed little pride in their work, and they did not cooperate well with one another. In the classroom of the democratic or socially integrative teacher, on the other hand, the children were relaxed and friendly, they worked well together, and they were interested in what they were doing. Careful observation made it clear that these differences in the children were the results of the differences in the attitudes toward them of their teachers. There is ample evidence that pupils reflect, in the classroom at least, the attitudes of their teachers.33

Comparing the creative thinking test gains of pupils of teachers
with high controlling attitudes and low controlling attitudes, Wodtke, in his investigation, concluded that "a high controlling teacher discourages self-initiated pupil talk, verbal creativity, and flexibility, but tends to encourage increased detail. . ."34

Walker, in his study of "Creativity and High School Climates," found that teachers, in high schools which provided a positive climate for creativity, were less authoritarian in their attitudes.35 Commenting on authoritarianism, Cowan states,

The compartmentalization, stereotyping and anti-intraception of the authoritarian personality prevents creative functioning.

...investigations with the California Psychological Inventory, for example, show that flexibility (creativity) and tolerance (lack of authoritarianism) are well correlated. This view of creativity . . . suggests that children can be helped to preserve their creativity by non-authoritarian attitudes on the part of parents and teachers . . .36

Ann Roe has cited several attitudes within the school which affect creative children more adversely than other children. She cites first "the insufficient valuation of problem-solving attitudes", says Roe,

This is particularly prevalent in the lower grades, perhaps because of the presumed necessity for concentration on the development of verbal skills in those levels.37

Another, cited by Roe, is the general tendency of teachers "to sweeping devaluation of 'wild' or 'silly' ideas." Admittedly, these kinds of ideas or questions can be a nuisance, however when they are dismissed without consideration and rejected with moralistic overtones the results "may lead to a general interpretation on the part of the child of the impropriety, or worse, of preconscious material."38 Torrance, commenting on the public evaluation of uncommon ideas or questions by teachers, maintains,
Much of the evaluative behavior of teachers appears to enable the teacher to control or coerce conformity to behavioral norms. Such evaluative behavior is not likely to have a positive influence upon any kind of truly creative behavior.39

Concluding this examination of investigations giving indication of the effect teachers' attitudes have on classroom climate and students is the following discussion of an investigation which describes the effect of contrasting educational environments--formal and informal--on creative growth in students. Haddon and Lytton describe the nature of the formal and informal schools used in their study as follows:

The formal or traditional school. . .places emphasis upon convergent thinking and authoritative learning.... The formal schools are not unfriendly but one senses a tighter rein and a firmer directive, ....the informal....emphasis is upon self-initiated learning and creative activities. One's impression in the informal school is of a relaxed, friendly atmosphere in which children move freely both within the classroom and in the school generally.40

The authors predicted that students from formal schools would score lower on divergent thinking tests than students from informal schools. The results of the investigation verified the authors' predictions. Although this study did not consider the attitudes of teachers, per se, one can infer that teachers--their attitudes and values, their beliefs and opinions, and their behaviors, verbal and non-verbal--are, to a large degree, responsible for the nature of the classroom environment described by Haddon and Lytton.

Educational Attitudes

As one investigates literature on education, teachers, and critics of education, it becomes increasingly evident that a basic dichotomy of
educational thought exists. This dichotomy, described by Kerlinger, "can be epitomized by the words 'restrictive' and 'permissive' or 'traditional' and 'progressive'." Travers offers a similar description,

Based on global observations and ratings of social interaction, classroom climates have been characterized as teacher-centered versus student-centered...

Other terms such as authoritarian versus democratic, permissive versus restrictive, dominative versus integrative have also been used in the literature to describe climates.

Franseeth, describing the same dichotomy uses yet another term—"open system" and "closed system". Defining each, Franseth maintains that an open system is,

One which accepts uniqueness in perception and thinking; and which permits originality, experimentation, initiative and invention. It is the opposite of the closed system where the concern is mainly with acquiring a body of knowledge, in memorizing facts, where the curriculum is prescribed and deals with mixed-answer problem-solving, and where the student learns to follow directions and to do as he is told.

If one accepts the premise that teachers, more than any other single individual in educational settings, have the greatest influence on the nature of the classroom environment—whether that environment is characterized as open or closed, restrictive or permissive, traditional or progressive, or some characterization in between—then it must follow that the attitudes teachers have about education—the educational process, the nature of the learning environment, and the means for achieving certain educational goals—are responsible, in large part, for the climate found in classrooms. For it is these educational attitudes which compel teachers to act in certain ways toward students.

There is ample evidence to support the existence of educational
attitudes characterized by the dichotomy described above. In two Q-studies, Kerling found two attitude factors which seemed to reflect progressive beliefs and traditional beliefs. From these two factors, Kerling developed scales to measure the factors. Large samples of individuals associated with the educational profession and those outside the profession were administered the scales. The author states,

It was predicted that, if items of the instrument containing the two scales were intercorrelated, A items (progressive) would correlate positively with other A items and B items (traditional) would correlate positively with other B items. There should be near-zero correlations between A and B items.

It was also predicted that a factor analysis of the item intercorrelations should produce two factors. The A items should be loaded positively and substantially on one factor and not on the other. The B items should be loaded positively and substantially on one factor, and not on the other.

According to Kerling, "the correlations conformed rather closely to the expectations. . . ." Thus it would appear that the studies of Kerling and his colleagues substantiate the existence of progressive and traditional educational attitudes. One might also conclude that teachers possess such educational attitudes, as Kerling describes, along a continuum from progressive to traditional.

**Summary and Conclusions**

This Chapter, from a review of relevant literature, presented a description of the cognitive and personological characteristics consistently found in creative individuals. Among these were high divergent thinking abilities described as sensitivity to problems, thinking fluency and flexibility, originality, elaboration, and re-definition. Dominant
personality characteristics found in creative individuals included a high sense of self—self-confidence, self-acceptance, self-sufficiency, self-assertiveness, and resourcefulness; a compelling need for independence in thought, judgment, and social interaction; high curiosity, adventurousness, and risk-taking; and behaviors that were described as radical, aggressive, dominant, and non-conforming. It was also found that some of the abrasive characteristics of the creative individual cause many problems with teachers and peers and that generally teachers do not prefer creative students nor do creative students prefer personality traits teachers prefer in students.

It was further found that attitudes of teachers can have a profound effect on the behavior, motivation, and achievement of students and the nature and quality of the classroom environment.

Assertions were made that classroom environments could be described as including characteristics along a continuum from a highly permissive, democratic, open, progressive atmosphere to a highly restrictive, authoritarian, closed, traditional one. It was further asserted that the educational climate—the sanctions of particular behaviors and not others; the norms of interpersonal relations, both between students and between students and teachers; the degree to which individual differences are valued—reflects the educational attitudes of teachers. Investigations thus far give clear indication that classroom environments which value highly conformity, submission to authority, restriction of behavior, ideas and questions are environments which are antithetical to the development of creative potential within those environments. This writer is in complete agreement with those who adamantly maintain "the effectiveness of schools in helping pupils
realize their creative potential hinges on the attitude of teachers toward creativity and its expression in their pupils."46
CHAPTER III
RESEARCH PROCEDURES

The previous chapter provided an examination of theoretical and conceptual considerations regarding the cognitive and personality characteristics of creative individuals. Additionally, the chapter discussed the attitudes of teachers toward the process of education and the creative student in particular.

This chapter will describe the procedures used to test the two hypotheses stated in Chapter I. The first section of this chapter will report the nature and size of the sample population used in this study. The second section will specify and describe the instruments used in this investigation and the administration procedures used.

The research design of this study involves two types of data. The first considers relationships which might exist in a teacher population sample and the second considers relationships which might exist in a student population sample. The specific relationships are those detailed in the two hypotheses of this investigation. Although, in some cases, sampled students and teachers are from the same classroom, no attempt is made to investigate relationships which might exist between a particular teacher and that teacher's class.

Sample Population

The sample population used in this study consists of 147 fourth grade students and 156 fifth grade students comprising a total student population sample of 303. Twenty-fourth and twenty-fifth grade teachers constitute the teacher population sample. The sample population of students and
teachers was drawn from a small New England working class school district. By request of the Superintendent of the school district, the district is not identified. This particular school district was chosen primarily for its co-operativeness, convenience and close proximity to the researcher and the expressed interest, by the Superintendent of the district, in the issues being investigated.

Research to date suggests that the fourth and fifth grades (and especially the fourth grade) are crucial years in the total creative development of students.\(^1\) This trend is important because of an unexplained drop in the level of curiosity of fourth grade students.\(^2\) Torrance concludes that, "it may well be that children are not less curious during their fourth year in school but that their teachers are less acceptant of their pupil's thinking."\(^3\) The population of fourth and fifth grade teachers and students was specifically chosen to provide further data in explaining this phenomenon. Reported in the following chapter will be significant differences this researcher finds in T-scores on the Torrance Tests of Creative Thinking between fourth and fifth grade students in the present study.

A researcher must face two important issues in obtaining a sample for an investigation—sample selection procedures (random vs. non-random methods of selection) and size of population (large vs. small). The ideal set of conditions would permit randomization of a large sample. These ideal conditions did not exist for this investigator. Unfortunately, the data collection schedule of this investigation coincided with another investigation using the same population of fourth and fifth grade students and teachers. Because a random selection procedure would have
subjected some of the population to two testing schedules and this fact
would seriously disrupt those class schedules, the Superintendent re-
quested the population sample for this study come from the remaining
population not participating in the other investigation. To comply with
the request of the Superintendent, this researcher chose to include all
the fourth and fifth grade students and teachers who were not partici-
pating in the other investigation, thus opting for a larger sample
population rather than randomness.

Regarding non-random samples, Kerlinger says, "It is not so much
that non-random samples may not be representative; in many cases they may
be representative. It is that we cannot say or assume they are repre-
sentative." Consequently, Kerlinger states, "when working with samples
that have not been selected at random, generalization to the characteristics
or relations between characteristics in the population is, strictly speaking, not possible." The interpretations made from the findings of this inves-
tigation are therefore limited to the specific population investigated
and are not generalizable to the general population.

Instruments Used In The Investigation

The first hypothesis of this investigation proposes that "Teachers
whose educational attitude is more reflective of Progressivism will
select more creative behavioral characteristics to be encouraged than
teachers whose educational attitude is reflective of Traditionalism."
For purposes of assessing teacher educational attitude, the Kerlinger
Education Scale VI was used. An adaptation of the Torrance Ideal Pupil
Checklist was used to assess the number of creative behavioral charac-
teristics to be encouraged by teachers. Following concurrently is a
description of both instruments.

The Kerlinger Educational Scale VI is a 46-item summated-rating type scale which includes 23 A (Progressivism) and 23 B (Traditionalism) items. According to Kerlinger,

ES-VI has been extensively factor analyzed, using first-order principal axes factor analysis and orthogonal (Verimax and Quartimax) and oblique (Promax) rotations. By and large the results indicate that two 'large' factors, A and B or Progressivism and Traditionalism, underlie attitudes toward education, and these factors are relatively orthogonal (r_AB - .25).^6

ES-VI is the result of considerable refinement of earlier educational scales developed by Kerlinger (ES-I, ES-II). Kerlinger maintains that the "reliability weakness of ES-I has been repaired with ES-VI."^7 The reliability coefficients have been consistently in the low and middle .80's for both A and B measures.

Scoring is accomplished by first identifying the A and B items by means of a key. ES-VI is a seven-point scale and respondents are instructed to give each item a positive or negative numerical value ranging from 3 to -3. These numerical values represent the extent to which the respondent agrees or disagrees with the statement. The scoring procedure requires that the numerical values of the respondent be translated into the following scheme: the positive values 3, 2, and 1 receive points of 7, 6, and 5 respectively; similarly, the negative values -3, -2, and -1 receive points of 1, 2, and 3 respectively; a no response receives 4 points.

Points for all the A items are summed and then divided by 10. The same procedure is followed for B items. A-B scores are the difference between the two. The score for the A items represent the degree of Progressivism
of educational attitudes and the B items represent the degree of Traditionalism of educational attitudes. The A-B score represents the consistency of attitude structure. A high positive or negative A-B score indicates attitudinal consistency while A-B scores near zero indicate attitudinal inconsistency. According to Kerlinger, educationally inconsistent persons tend not to make "clearcut differentiations among items. It is almost as though they respond in a chance fashion." The reason for the inconsistency interpreted from the near zero score is quite an open question and is obviously far less a precise interpretation than the interpretations of the A and B scores separately. Kerlinger states in conclusion,

ES-VI is a satisfactory measure of attitudes toward education. It is factorially valid and reasonably reliable. If one wants to be fairly sure of substantial reliability for both the A and B measures, use ES-VI.

The Torrance Ideal Pupil Checklist is composed of 15 behavioral characteristics considered more important for a productive creative personality by a panel of ten judges; and 15 behavioral characteristics considered least important or even a liability for a productive creative personality. The characteristics are weighted according to their position in the Q-Sort of the panel of ten judges as follows: characteristics in pile "1" and "10" (the characteristics considered most and least important for a productive creative personality, respectively) receive 4 points; characteristics in piles "2" and "9" receive 3 points; characteristics in piles "3" and "8" receive 2 points; and characteristics in piles "4" and "7" receive 1 point.

Instructions to respondents include checking once those characteristics
respondent thinks should be encouraged; checking twice those characteristics respondent thinks should be especially encouraged; and striking through those characteristics respondent thinks should be discouraged. The weights for responding include awarding a plus 1 for checking a characteristic considered most important for a creative personality; plus 2 for double checking a characteristic considered most important for a creative personality; and minus 1 for striking through a characteristic considered most important for a creative personality. For responses to characteristics considered least important for a creative personality, the following points are awarded: minus 1 for checking once; minus 2 for double checking; and plus 1 for striking through characteristics in this category.

The items, listed alphabetically, must be identified as to weight and type (most or least important characteristic) by means of a key. For each category of behavioral characteristic (item), a plus or minus point can be accrued. Care must be taken in awarding the proper response points and sign (plus or minus) of the item to the appropriate category. Points are awarded by multiplying the weight given according to the response scheme by the weight of the item obtained from the key. In essence there are two weights for each item, a response weight and an item weight. Plus and minus signs must be maintained at all times. Finally, all plus and minus products are summed separately under each category or characteristic and the negative sums subtracted from the positive sums.

Interpretation of the scores is as follows: for the category of characteristics termed most important for a productive creative personality (designated X scores for identification purposes), a plus score indicates the
degree to which respondent believes the more creative characteristics should be encouraged (maximum score, plus 58). A minus score in this category indicates the degree to which most creative behavioral characteristics should be discouraged (maximum negative score for this category, minus 29). For the category of characteristics termed least important for a productive creative personality (designated Y scores), a plus score indicates the degree to which respondents believe the characteristics should be discouraged (maximum positive score for this category, plus 29). A minus score in the category indicates the degree to which the least creative behavioral characteristics should be encouraged (maximum negative scores, minus 58). Parsimoniously stated, the X scores on the Ideal Pupil Checklist are designed to represent the degree to which respondent believes the more creative behavioral characteristics should be encouraged and the least creative behavioral characteristics discouraged. Y scores on the Ideal Pupil Checklist are designed to represent the degree to which respondent believes the least creative behavioral characteristics should be encouraged and the most creative behavioral characteristics discouraged.

The second hypothesis of this investigation proposes that "Students who score high on creativity tests will prefer more creative behaviors than students who score low on creativity tests." The creativity tests used were the Torrance Tests of Creative Thinking, Figural Form A. To assess the number of creative behaviors students prefer, a Creative Behavior Preference Inventory was developed by this investigator. Both instruments are concurrently described below.

The Torrance Tests of Creative Thinking, Figural Form A, consists of
three subtests all contained in one test booklet. The first subtest called Picture Construction is designed to assess originality and elaboration. Contained in this first subtest is a piece of colored paper in the form of a curved shape and subjects are instructed to use the shape as part of a picture they are to complete and title. The shape can be placed anywhere on a blank page and is adhesive to stay in place. The very explicit directions further instruct the subjects to construct "clever" and "unusual" pictures and "to think of a picture no one else will think of". Subjects are given ten minutes to complete this first subtest.

Scoring for originality in the first subtest requires two considerations. First, points are given for originality of the completed picture. Since the shape itself will elicit certain common responses, e.g., an egg or tear drop (in the case of Figural Form A used in this investigation), responses are weighted from 0 to 5 according to the frequency of response. The scoring guide provides a list of responses and appropriate weights "based on the responses of 500 subjects ranging from kindergarten through college."12

The second consideration in scoring for originality in the first subtest is that of title originality. According to the scoring guide, "titles are evaluated on a scale ranging from zero to three on originality or cleverness according to the following criteria: obvious class titles—zero; simple descriptive titles at a concrete level, involving a modifier plus a class—1 point; imaginative, descriptive titles in which the modifier goes beyond concrete, physical description—2 points; and abstract but appropriate titles, going beyond what can be seen and telling a story—3
Examples of each criterion are provided in the scoring guide to aid in conceptualizing the differences.

In scoring for elaboration, points are given for each meaningful and appropriate idea added to the original stimulus figure (the colored shape provided). Various detailed criteria are provided as an aid in the scoring guide.

The second subtest, Picture Completion, assesses flexibility, originality, and elaboration. There are ten incomplete pictures which subjects are again instructed to complete in a "clever" and "unusual" manner. A title must accompany each picture completed. Describing the rationale for this activity, Torrance remarks,

As is well known from Gestalt psychology, an incomplete figure sets up in an individual tensions to complete it in the simplest and easiest way possible. Thus, to produce an original response, the subject usually has to control his tensions and delay gratification of this impuse to closure.\(^{14}\)

Subjects are given ten minutes to complete this task.

The fluency score is simply the number of pictures completed. Since Torrance has found approximately one-third of a group of subjects will complete all ten pictures within the time allotted, he cautions that "this activity provides a fluency score of only moderate usefulness."\(^{15}\)

In scoring for originality, points are awarded both for the response and for the title, as in the previous task, Picture Construction. The procedure for scoring the response is similar as well, with a list of responses weighted according to the frequency of response. Scoring for title originality is exactly as the previous task.

The flexibility score is obtained "by counting the number of different
categories into which the responses fall."¹⁶ The title and the response are considered in determining the category. The scoring procedure makes provisions for new categories not included in the list.

The final subtest, called Lines, consists of thirty pairs of parallel lines. Subjects are instructed to complete as many different, clever or unusual objects or pictures as possible and in as much detail as possible, thus assessing all four types of divergent thinking—fluency, flexibility, originality, and elaboration. The instructions, according to Torrance, "set up a conflict among the response tendencies represented by them."¹⁷ This activity also has a time limit of ten minutes.

The fluency score represents the number of completed responses minus duplications and responses that do not make use of the parallel lines.

Flexibility is scored the same as the previous activity, by counting the number of different categories into which the subject's responses can be classified.

The scoring procedure for originality is the same in this task as in the two previous ones with two exceptions: (1) points are not given for a title and (2) bonus points are awarded for combining sets of parallel lines to make a single response. Elaboration is scored the same as stated in the two previous tasks.

Because the scoring procedures are extremely complex and time consuming, this investigator used the scoring service provided through the publisher and monitored by the author.

Scholarly reviews of the Torrance Tests of Creative Thinking are mixed in their assessments of the tests. The two most persistent criticisms raised are that the tests measure "certain particular aspects"
of creativity, not the universe of creative behaviors and that there needs to be "much more work examining the predictive validity of the test."\textsuperscript{18} One critic maintains, "It is quite possible that a subject can give many unusual uses for a brick or a cardboard box, but fail to perform originally in a real-life situation."\textsuperscript{19} Despite these limitations, reviewers state the tests have "adequate reliability" and that the tests "do measure behaviors consistent with the literature on creative behavior."\textsuperscript{20}

Two instruments, developed by Torrance and used in a study he conducted to investigate how different cultures evaluate creative characteristics, form the basis of the Ray Creative Behavior Preference Inventory. The two instruments, The Ideal Pupil Checklist and the Creative Personality Q-Sort, were described earlier in this chapter. It may be recalled that from the list of sixty-two characteristics comprising the Ideal Pupil Checklist a Q-Sort was developed using a panel of ten judges. Torrance further developed a composite Q-Sort of the characteristics by combining the ratings of the ten experts, adding the ratings received by each item, ranking the items on the basis of these values, and then placing them into the original Q-Sort distribution.\textsuperscript{21} From this composite Q-Sort distribution, this investigator selected thirty characteristics--fifteen at the "high" end of the Q-Sort and fifteen from the "low" end. Characteristics selected from the high end of the Q-Sort were obtained by including all the characteristics in piles "1", "2", and "3" of the Q-Sort which constituted nine characteristics. From pile "4", which included ten characteristics, six were randomly selected. Similarly, characteristics from the low end were obtained by including all the characteristics in piles "10", "9" and "8" and randomly selecting six characteristics from
pile "7" which included eight characteristics.

Four behavioral statements were constructed to represent each of the thirty characteristics and were submitted to six experts. The experts were asked to rank the four statements for each characteristic, from one to four, indicating which statements best illustrated that particular characteristic. By comparing the ranking of the experts, two statements were chosen which represented unanimous or majority agreement among the experts, thus comprising an instrument of 60 statements. This procedure was utilized to establish content validity.

For purposes of refining the Ray Creative Behavior Preference Inventory, the instrument was field tested using a population of 135 4th, 5th and 6th grade students in the Dayton (Ohio) City School District. The field testing also provided data for obtaining an estimate of reliability of the instrument. Reliability coefficients were calculated, using two different procedures of the split-half method for estimating reliability for the Ray Creative Behavior Preference Inventory. The first procedure included dividing the 60-item instrument into two equivalent "halves". The "halves" represented the "odd" and "even" numbered items. Since the original sequencing of items had been accomplished by randomly selecting items, the division of odd/even items was consistent with procedures of the split-half method. The correlation for these half-tests were then used to estimate the self-correlation of the whole test by the Sperman-Brown prophecy formula (79). The reliability coefficient calculated was .4991.

The second procedure differed from the first in the division of the "halves". Instead of using all 60 items, all items representing the more
creative characteristics \((X\) items) and all items representing the least creative characteristics \((Y\) items) were halved separately. This procedure essentially produced two "tests" half the length of the test used in the first procedure. Calculation procedures for reliability coefficients used were the same as described above. The reliability coefficients calculated were .4748 for \(X\) items and .4521 for \(Y\) items. It should be noted that the coefficients calculated by the second split-half procedure \((r_X = .4748, r_Y = .4521)\) were not appreciably different from the coefficient calculated by the first procedure \((r = .4991)\). By reducing the length of the test by half, as was done in the second procedure, it was expected that the coefficient would be smaller. Since such was not the case, the evidence suggests that the "half-tests" (\(X\) and \(Y\) items) separately are more reliable than the "whole" test.

Using the Lorge Formula, a Readability Index of 3.97 was calculated which describes the estimated reading grade level of the instrument. Lorge states that the formula,

\[
\text{is based on a criterion derived from responses to questions of the five types (specific details, general import, appreciation, knowledge of vocabulary, and understanding of concepts). It tends, therefore to overestimate the difficulty of passages to be read primarily for appreciation as for general import; and it tends to underestimate the difficulty of passages to be read primarily for specific details or for following directions. Nevertheless, the Lorge Formula provides an overall estimate which should be useful in grading materials.}\]

Lorge cautions the user, stating that the Formula "is an estimate and not a rigorous determination."\(^2^3\)

Even though the Readability Index indicated the RCBPI was appropriate for the test sample population, it was anticipated some students may have difficulty reading the items, requiring the test administrator to read the
items to the student. Therefore, in the field test of the instrument, two procedures of administration were used. One group was given verbal instructions and each test item was read aloud. At the end of the test, subjects were instructed to put a large "X" on the front page. Another group in the field test was given verbal instructions and were told to respond to each item read silently. At the completion of the instrument, students were instructed to put a large "0" on the front page. The large "X" and "0" indicated which procedure was followed. Finally, a frequency distribution of the responses for both procedures was produced to determine if a considerable discrepancy existed between the distribution of responses administered under the two different procedures. The frequency distribution indicated no such discrepancy. The procedure used in this investigation required respondents to read and respond silently to each item.

Students were told the booklet contained 60 sentences and some of the sentences might refer to them. If the student agreed the statement referred to him/her, the student should indicate this agreement by putting an "X" in the box under YES. If the statement did not refer to the student, the student should indicate this disagreement by putting an "X" in the box under NO. Two sample sentences were provided to aid procedural understanding. To receive either a positive or negative score for an item, the response had to be marked in the YES box, except for items number 16, 46, and 51. These three items received a positive or negative score only if the response was in the NO box. It was found in the field test of the instrument sentences stated in the negative requiring a "yes" response was confusing. To refine the instrument, these confusing sentences were stated positively and required a "no" response. For example, the statement
"I don't believe everything I hear or read," requiring a "yes" response was changed to "I believe everything I hear or read," requiring a "no" response.

Each item was weighted according to its position in the original Creativity Personality Q-Sort. The weights were distributed as follows: items representing characteristics in pile "1" were weighted 4; those in pile "2" received 3; those in pile "3", 2; and those items representing characteristics in pile "4" were weighted 1. Similarly, items representing characteristics in pile "10" received a weight of -4; those in pile "9" received -3; those in pile "8", -2; and those in pile "7" received a -1.

The items, having been sequenced randomly, are scored with a key identifying the positive or negative weight for each item. The positive and negative weights are summed separately, yielding two scores for each respondent. The maximum number of either positive or negative score is 58. The two positive or negative scores are designed to represent the degree to which the more creative or least creative behaviors are preferred, with the positive score representing the more creative behaviors preferred and the negative score the least creative behaviors preferred.

The time period of collecting data for this investigation included the week of June 11 through 15, 1973. The investigator and two colleagues administered the instruments to the sample population of the study. Within the teacher sample were twenty teachers whose classes were not included in the student population sampled. Instruments used to assess teacher educational attitudes and the number of creative behavioral characteristics to be encouraged were distributed to this group of twenty
teachers and collected the next day by the investigator. Each set of two instruments was numbered for identification purposes, since names were not required. In addition to completing the instruments as required by the instructions on the cover of each of the instruments, teachers were asked to supply the following information:

1. Total number of years teaching
2. Grade level now teaching
3. Number of years teaching the above grade level
4. Educational background
5. Sex

Significant patterns found between this secondary information and primary information related to the two hypotheses of this investigation will be reported in the following chapter.

Summary

This chapter has sought to describe the procedures used to test the two hypotheses of this study as stated in Chapter I. Pursuant to this objective, the nature and size of the sample population was described to contain 303 students and 40 teachers. The instruments, their purpose, scoring procedure, and interpretation of the yielded data, were described in some detail. Finally, procedures used to administer the instruments to the sample population were outlined.
CHAPTER IV
PRESENTATION AND ANALYSIS OF FINDINGS

Presented in this chapter are analyses of data used to test the hypotheses of this investigation. In addition, exploratory findings which may give direction to further investigation are reported. The chapter is divided into three sections. The first section presents all relevant data and analyses related to evidence which support or does not support the hypotheses. Section two presents selected exploratory findings. The final section includes summaries of teacher and student data, and tentative conclusions.

Hypotheses Associated with the Teacher Sample

The first hypothesis, as stated in Chapter I, predicted teachers whose educational attitude is more reflective of Progressivism will select more creative behavioral characteristics to be encouraged than teachers whose educational attitude is reflective of Traditionalism. In order to statistically test the above substantive hypothesis, the following minor hypotheses were developed:

Minor Hypothesis 1
Teachers with high A scores on the Kerlinger Education Scale-VI (Progressive educational attitudes) will achieve high X scores on the Torrance Ideal Pupil Checklist (encourage most creative behavioral characteristics, discourage least creative behavioral characteristics).

Minor Hypothesis 2
Teachers with high A scores on the Kerlinger Education Scale-VI (Progressive educational attitudes) will achieve high Y scores on the Torrance Ideal Pupil Checklist (encourage least creative behavioral characteristics, discourage most creative behavioral characteristics).
Minor Hypothesis 3

Teachers with high $B$ scores on the Kerlinger Education Scale-VI (Traditional educational attitudes) will achieve low $Y$ scores on the Torrance Ideal Pupil Checklist (encourage least creative behavioral characteristics, discourage most creative behavioral characteristics).

Minor Hypothesis 4

Teachers with high $B$ scores on the Kerlinger Education Scale-VI (Traditional educational attitudes) will achieve low $X$ scores on the Torrance Ideal Pupil Checklist (encourage most creative behavioral characteristics, discourage least creative behavioral characteristics).

As a point of reference, it may be noted that $X$ scores on the Torrance Ideal Pupil Checklist are designed to represent the degree to which respondent believes the more creative behavioral characteristics should be encouraged and the least creative behavioral characteristics discouraged. Scores on this $X$ variable range from 58 to -29. Similarly, $Y$ scores on the same instrument are designed to represent the degree to which respondent believes the least creative behavioral characteristics should be encouraged and the most creative behavioral characteristics discouraged. Scores on this $Y$ variable range from 29 to -58.

Using Pearson product-moment correlation procedures, $A$ scores on the Kerlinger Education Scale-VI were correlated with $X$ scores on the Torrance Ideal Pupil Checklist of the teacher sample ($N = 40$). A positive correlation coefficient of .3344 ($p < .05$) was calculated. $B$ scores on the ES-VI and $Y$ scores on the TIPC produced a negative correlation coefficient of -.3435 ($p < .05$). Negative correlation coefficients of -.0975 and -.0985 were produced by correlating $A$ scores on ES-VI with $Y$ scores on the TIPC and by correlating $B$ scores on ES-VI with $X$ scores on the TIPC, respectively (See Table 1). To be significant at the .05 level
of significance, the value of r had to be .312 or greater. The data indicates, for this sample, there is a significant positive relationship between \( A \) scores on ES-VI and \( X \) scores on the TIPC, however the relationship is weak. The data also indicates for this sample, there is a significant negative relationship, though again weak, between \( B \) scores on ES-VI and \( Y \) scores on the TIPC (See Appendix D for means and standard deviations of teacher scores on all measurements).

The existence of the positive significant coefficient produced by correlating \( A \) scores on ES-VI with \( X \) scores on the TIPC supports the first minor hypothesis. The near zero negative correlation coefficient produced by correlating \( A \) scores on the ES-VI with \( Y \) scores on the TIPC does not support the second minor hypothesis. The existence of the negative significant coefficient produced by correlating \( B \) scores on ES-VI with \( Y \) scores on the TIPC supports the third minor hypothesis. The near zero correlation coefficient produced by correlating \( B \) scores on the ES-VI with \( X \) scores on the TIPC does not support the fourth minor hypothesis.

In reference to the substantive hypothesis associated with the teacher sample, it can be said that, for this sample, teachers whose educational attitude is more reflective of Progressivism, as measured by \( A \) scores on the Kerlinger Education Scale-VI, do tend to feel the more creative behavioral characteristics necessary for a productive creative personality should be encouraged, as measured by \( X \) scores on the Torrance Ideal Pupil Checklist. It can also be stated that, for this sample, teachers whose educational attitude is reflective of Traditionalism, as measured by \( B \) scores on the ES-VI, tend to feel the least creative behavioral characteristics necessary for a productive creative personality
should be encouraged, as measured by \( Y \) scores on the TIPC.

**TABLE 1**

Correlation Matrix of Teacher Scores on the Kerlinger Education Scale-VI and the Torrance Ideal Pupil Checklist

<table>
<thead>
<tr>
<th>Variable</th>
<th>TIPC, X</th>
<th>TIPC, Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES-VI, A</td>
<td>.3344*</td>
<td>-.0975</td>
</tr>
<tr>
<td>ES-VI, B</td>
<td>-.0985</td>
<td>-.3435*</td>
</tr>
</tbody>
</table>

\( N = 40 \)

*p < .05

**Hypotheses Associated with the Student Sample**

The second hypothesis, as stated in Chapter I, predicted students who score high on creativity tests will prefer more creative behaviors than students who score low on creativity tests. From this substantive hypothesis, the following minor hypotheses were developed;

**Minor Hypothesis 5**

Students with high scores on Fluency, Flexibility, Originality, and Elaboration of the Torrance Tests of Creative Thinking will achieve high \( X \) scores on the Ray Creative Behavior Preference Inventory.

**Minor Hypothesis 6**

Students with low scores on Fluency, Flexibility, Originality, and Elaboration of the Torrance Tests of Creative Thinking will achieve low \( X \) scores on the Ray Creative Behavior Preference Inventory.

**Minor Hypothesis 7**

Students with high scores on Fluency, Flexibility, Originality, and Elaboration of the Torrance Tests of Creative Thinking will achieve low \( Y \) scores on the Ray Creative Behavior Preference Inventory.
Minor Hypothesis 8

Students with low scores on Fluency, Flexibility, Originality, and Elaboration of the Torrance Tests of Creative Thinking will achieve high $Y$ scores on the Ray Creative Behavior Preference Inventory.

As a point of reference, it is noted that $X$ scores on the Ray Creative Behavior Preference Inventory are designed to represent the degree to which respondent prefers behaviors considered most important for a productive, creative personality. Scores on this $X$ variable range from 0 to 87. Similarly, $Y$ scores on the Ray Creative Behavior Preference Inventory are designed to represent the degree to which respondent prefers behaviors considered least important for a productive, creative personality. Scores on this $Y$ variable range from 0 to -87.

Again, using Pearson product-moment correlation procedures, scores on the Ray Creative Behavior Preference Inventory were correlated with scores on the Torrance Tests of Creative Thinking—Fluency, Flexibility, Originality, and Elaboration. The calculated correlation coefficients were as follows: $X$ scores on the RCBPI with scores on the TTCT-Fluency produced a positive coefficient of .0468; $X$ scores on the RCBPI with scores on the TTCT-Flexibility produced a positive coefficient of .0798; $X$ scores on the RCBPI with scores on the TTCT-Originality produced a positive coefficient of .0713; $X$ scores on the RCBPI with scores on the TTCT-Elaboration produced a negative coefficient of -.0650. $Y$ scores on the Ray Creative Behavior Preference Inventory correlated with scores on the Torrance Tests of Creative Thinking produced the following coefficients: $Y$ with Fluency, a negative coefficient of -.1129; $Y$ with Flexibility, a negative coefficient of -.0891; $Y$ with Originality, a negative co-
efficient of -.1010; and \( Y \) with Elaboration, a positive coefficient of .0534. To be significant at the .05 level of significance with a sample \( N \) of 303, the value of \( r \) had to be .113 or better. Although the correlation coefficients were in the predicted direction, except for the coefficients produced by correlating scores on the Ray Creative Behavior Preference Inventory with Elaboration scores on the Torrance Tests of Creative Thinking, which were in the opposite direction, the data indicates extremely weak to no relationships between the cited variables. Since none of the correlation coefficients of the student sample scores attained the acceptable value (See Table 2), none of the minor hypotheses associated with the student sample can be accepted. The second substantive hypothesis, therefore is not supported by the data (See Appendix E for means and standard deviations of student scores on all measures).

Table 2

Correlation Matrix of Student Scores on the Torrance Tests of Creative Thinking—Fluency, Flexibility, Originality, and Elaboration with Scores on the Ray Creative Behavior Preference Inventory

<table>
<thead>
<tr>
<th>Variable</th>
<th>RCBPI, ( X )</th>
<th>RCBPI, ( Y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTCT-Fluency</td>
<td>.0468</td>
<td>-.1129</td>
</tr>
<tr>
<td>TTCT-Flexibility</td>
<td>.0798</td>
<td>-.0891</td>
</tr>
<tr>
<td>TTCT-Originality</td>
<td>.0713</td>
<td>-.1010</td>
</tr>
<tr>
<td>TTCT-Elaboration</td>
<td>-.0650</td>
<td>.0534</td>
</tr>
</tbody>
</table>

\( N = 303 \)
It is inevitable that the process of empirical investigation results in additional questions as well as data tangential to the original purpose of the study. It is the responsibility of the researcher to attend to these additional questions and data, at least to the extent that the researcher feels reporting such findings and raising such questions will contribute to further development of the subject field. The following section will report exploratory findings and pose questions raised by these findings related to both the teacher and student sample.

Exploratory Findings Associated with the Teacher Sample

Profile data obtained for the teacher sample included the following variables: variable 1, the number of years teaching--ranging from 1 year to over 21 years; variable 2, the grade level now teaching--4th or 5th grade; variable 3, the number of years teaching the grade level identified--ranging from 1 year to over 21 years; variable 4, education level--ranging from Bachelor's degree to Doctor's degree; variable 5, sex--coded 1 for males and 2 for females. Following is reported findings between the above variables and scores on the Torrance Ideal Pupil Checklist and scores on the Kerlinger Education Scale-VI.

Finding 1

Years teaching correlated with X and Y scores on the Torrance Ideal Pupil Checklist produced a near zero negative Coefficient of -.0625 with X scores and a positive coefficient of .1727 with Y scores. These data indicate that, for this sample, there exists an extremely weak positive relationship between the number of years in the teaching profession and the degree to which teachers feel characteristics least
important for a productive creative personality should be encouraged and characteristics most important for a productive creative personality discouraged (See Table 3 for means, variance, and standard deviations of scores by years teaching).

Finding 2

Years teaching correlated with scores on ES-A produced a negative correlation coefficient of -.2002. The same variable correlated with scores on ES-B produced a positive coefficient of .1095. Although the relationships are very weak, at best, the direction of the coefficients indicate, for this sample, teachers who teach longer are less Progressive and more Traditional in their educational attitudes.

Finding 3

Correlation coefficient calculations for level of education and Y scores on the TIPC produced a positive coefficient of .3676 (p < .05). Since Y scores on the TIPC range from 29 to -58, more education with high Y scores and less education with low Y scores yield a positive correlation coefficient. The above significant positive correlation coefficient indicates, for this sample, the more education teachers acquire the less they are inclined to feel characteristics least important for a creative personality should be encouraged (See Table 4).
### TABLE 3

Means, Standard Deviations, and Variances of Teacher Scores on the Kerlinger Education Scale VI and the Torrance Ideal Pupil Checklist by the Number of Years Teaching

<table>
<thead>
<tr>
<th>Variable</th>
<th>1 - 5 years (N=6)</th>
<th>6 - 10 years (N=11)</th>
<th>11 - 15 years (N=8)</th>
<th>16 - 20 years (N=7)</th>
<th>21 plus years (N=8)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>V</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>ES-A</td>
<td>13.2</td>
<td>.80</td>
<td>.70</td>
<td>12.3</td>
<td>1.5</td>
</tr>
<tr>
<td>ES-B</td>
<td>9.9</td>
<td>1.4</td>
<td>2.1</td>
<td>9.3</td>
<td>1.8</td>
</tr>
<tr>
<td>TIPC, X</td>
<td>40.5</td>
<td>9.95</td>
<td>99.1</td>
<td>34.18</td>
<td>8.76</td>
</tr>
<tr>
<td>TIPC, Y</td>
<td>11.16</td>
<td>4.35</td>
<td>18.96</td>
<td>-6.0</td>
<td>8.55</td>
</tr>
<tr>
<td>Variable</td>
<td>Bachelor's (N=10)</td>
<td>Bachelor's plus (N=16)</td>
<td>Master's (N=2)</td>
<td>Master's plus (N=11)</td>
<td>Doctor's (N=1)</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------</td>
<td>------------------------</td>
<td>----------------</td>
<td>-----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>V</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>ES-A</td>
<td>11.4</td>
<td>1.9</td>
<td>3.9</td>
<td>12.9</td>
<td>1.4</td>
</tr>
<tr>
<td>ES-B</td>
<td>9.9</td>
<td>1.9</td>
<td>3.8</td>
<td>10.2</td>
<td>2.4</td>
</tr>
<tr>
<td>TIPC, X</td>
<td>35.7</td>
<td>9.63</td>
<td>92.9</td>
<td>36.06</td>
<td>8.99</td>
</tr>
<tr>
<td>TIPC, Y</td>
<td>-10.3</td>
<td>6.53</td>
<td>42.67</td>
<td>-7.62</td>
<td>6.36</td>
</tr>
</tbody>
</table>
**Finding 4**

Education level correlated with A and B scores on the ES-VI produced a near zero coefficient of .0311 with A scores and a negative coefficient of -.2439 with B scores. More education with high B scores or less education with low B scores yield a positive correlation coefficient. More education with low B scores and less education with high B yield a negative correlation coefficient. The above weak negative coefficient indicates, for this sample, the more education teachers acquire the less Traditional teachers are in their educational attitudes. This interpretation is made cautiously, however, since the coefficient was not significant statistically.

**Finding 5**

Sex (coded 1 for males, 2 for females) correlated with X scores on the TIPC produced a near zero positive coefficient of .0880; sex with Y scores on the TIPC produced a negative coefficient of -.2292. According to the interpretation of Y scores on the TIPC, high Y scores indicate respondents are less inclined to feel characteristics least important for a creative personality should be encouraged; low Y scores indicate respondents are more inclined to feel characteristics least important for a creative personality should be encouraged (scores range from 29 to -58). The above correlation coefficient, though not statistically significant, indicates, for this sample, female teachers tend to feel characteristics least important for a creative personality
should be encouraged (See Table 5).

**Finding 6**

*Sex* correlated with *A* scores on the ES-VI produced a negative coefficient of \(-.1424\); the same variable correlated with *B* scores on the ES-VI produced a positive coefficient of \(.3925\) (\(p < .05\)). These data indicate, for this sample, that a very weak negative relationship exists between females and Progressive educational attitudes and that a stronger, though still weak, relationship exists between females and Traditional educational attitudes.

**Finding 7**

Intercorrelations between *X* and *Y* scores on the TIPC produced a positive coefficient of \(.1443\).

**Finding 8**

Intercorrelations between *A* and *B* scores on the ES-VI produced a near zero negative coefficient of \(-.0153\). This finding agrees with the near zero coefficient Kerlinger found between the two variables.*

**Exploratory Findings Associated with the Student Sample**

The following exploratory data are organized around differences in scores on the Ray Creative Behavior Preference Inventory and the Torrance Tests of Creative Thinking between 4th and 5th grade students and between male and female students of the sample. Two statistical procedures were used to investigate both the existence of differences and the extent of differences—the latter being the more important of the two investigations.
TABLE 5

Means, Standard Deviations, and Variances of Teacher Scores on the Kerlinger Education Scale VI and the Torrance Ideal Pupil Checklist by Sex

<table>
<thead>
<tr>
<th>Variable</th>
<th>Male (N=11)</th>
<th>Female (N=29)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>ES-A</td>
<td>12.7</td>
<td>1.0</td>
</tr>
<tr>
<td>ES-B</td>
<td>8.2</td>
<td>1.5</td>
</tr>
<tr>
<td>TIPC, X</td>
<td>35.18</td>
<td>9.71</td>
</tr>
<tr>
<td>TIPC, Y</td>
<td>-4.18</td>
<td>6.01</td>
</tr>
</tbody>
</table>

*A correlation matrix for teacher scores on all variables and measurements is found in Appendix F.*
(for one can accurately assume differences exist in any large random or near random group). The two statistical procedures included Pearson product-moment correlations and t-tests of the difference between two means.

The results of t-test calculations produced no significant differences between either the two means of 4th and 5th grade students on RCBPI X scores, RXBPI Y scores, TTCT-Fluency, Flexibility, Originality, and Elaboration scores or between the two means of male and female students on the same variables. Pearson product-moment correlations, however, indicated weak relationships between certain variables. Following, are reported those relationships (See Table 6 for means and standard deviations of student scores on all measurements by sex and grade).

Finding 9

X scores on the Ray Creative Behavior Preference Inventory correlated with grade produced a near zero negative correlation coefficient, -.0080. Y scores on the same instrument correlated with grade produced a larger negative coefficient -.2577 (p < .01), indicating a weak relationship. Y scores on the RCBPI range from 0 to -87, therefore high Y scores indicate respondents are inclined to prefer behaviors considered least important for a creative personality but not to the degree low Y scores indicate. The above significant negative correlation coefficient indicates that, for this sample, 5th grade students tend to prefer those behaviors considered least important for a
TABLE 6

Means and Standard Deviations of Student Scores on the Ray Creative Behavior Preference Inventory and the Torrance Tests of Creative Thinking, by Sex and Grade

<table>
<thead>
<tr>
<th>Variables</th>
<th>Male (N=148)</th>
<th></th>
<th>Female (N=155)</th>
<th></th>
<th>4th (N=147)</th>
<th></th>
<th>5th (N=156)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>RCBPI, X</td>
<td>41.92</td>
<td>7.844</td>
<td>38.96</td>
<td>7.409</td>
<td>40.47</td>
<td>7.373</td>
<td>40.35</td>
<td>8.121</td>
</tr>
<tr>
<td>RCBPI, Y</td>
<td>30.24</td>
<td>7.523</td>
<td>30.96</td>
<td>7.285</td>
<td>32.57</td>
<td>7.132</td>
<td>28.76</td>
<td>7.188</td>
</tr>
<tr>
<td>TTCT-Flx</td>
<td>15.68</td>
<td>4.895</td>
<td>16.79</td>
<td>4.417</td>
<td>16.76</td>
<td>4.602</td>
<td>15.76</td>
<td>4.718</td>
</tr>
<tr>
<td>TTCT-Elab</td>
<td>67.28</td>
<td>26.260</td>
<td>70.31</td>
<td>22.645</td>
<td>65.31</td>
<td>22.889</td>
<td>72.14</td>
<td>25.528</td>
</tr>
<tr>
<td>TTCT-T-Flu</td>
<td>45.95</td>
<td>10.074</td>
<td>48.04</td>
<td>9.878</td>
<td>48.68</td>
<td>10.091</td>
<td>45.45</td>
<td>9.712</td>
</tr>
<tr>
<td>TTCT-T-Flx</td>
<td>49.16</td>
<td>9.226</td>
<td>51.13</td>
<td>8.321</td>
<td>51.03</td>
<td>8.697</td>
<td>49.35</td>
<td>8.877</td>
</tr>
<tr>
<td>TTCT-T-Orig</td>
<td>51.91</td>
<td>12.326</td>
<td>53.87</td>
<td>12.662</td>
<td>54.20</td>
<td>12.901</td>
<td>51.70</td>
<td>12.060</td>
</tr>
<tr>
<td>TTCT-T-Elab</td>
<td>53.57</td>
<td>12.185</td>
<td>54.88</td>
<td>10.441</td>
<td>52.58</td>
<td>10.519</td>
<td>55.81</td>
<td>11.858</td>
</tr>
</tbody>
</table>
productive creative personality.

Finding 10

Fluency scores on the Torrance Tests of Creative Thinking correlated with grade produced a negative correlation coefficient of -.1609 ($p < .01$). Flexibility and Originality scores correlated with grade also produced negative coefficients of -.1068 and -.0999, respectively. The coefficient calculated for Elaboration scores and grade was near zero, .0052. Although the relationships ranged from weak to nearly non-existent, there is the slight suggestion that 5th grade students in this sample tend to score lower on the TTCT than 4th grade students. Torrance has found that there is a drop in the level of creativity (as measured by his tests) at about the 4th grade. One cannot resist posing the question, "Is there a continuous decrease in creativity test scores the higher the level of schooling?"

Finding 11

Sex (coded 1 for males, 2 for females) correlated with $X$ scores on the RCPBI produced a negative coefficient of -.1910 ($p < .01$) indicating a weak relationship. This significant negative coefficient indicates that, for this sample, female students tend to prefer less those behaviors considered most important for a productive, creative personality.
Finding 12

Flexibility and Elaboration scores on the TTCT correlated with sex, produced positive coefficients of .1181 (p < .05) and .1157 (p < .05), respectively. These weak relationships indicate that, for this sample, female students scored higher on these two variables than males. The coefficient for Elaboration tends to agree with Torrance's findings that "girls generally have higher Figural Elaboration scores than boys." These data are interesting when compared with finding 11. For this sample, females tend to prefer less those behaviors considered most important for a productive creative personality and females also tend to score higher than males on the variables Flexibility and Elaboration.

Finding 13

X scores on the RCPBI when correlated with Y scores on the same instrument produced a negative correlation coefficient of -.2240 (p < .01).

Finding 14

X scores on the RCPBI correlated with the four variables of the TTCT--Fluency, Flexibility, Originality, and Elaboration produced the following respective correlation coefficients: .0468, .0798, .0713 and -.0650, indicating a near zero relationship between X scores and the cited variables on the TTCT. Y scores on the RCBPI correlated with the same four variables produced the following respective correlation
coefficients: -.1129 with Fluency; -.0891 with Flexibility; -.1010 with Originality and .0534 with Elaboration (See Table 2). These data indicate while both the RCPBI and the TTCT are purported to relate to creativity, the two instruments are obviously measuring different things.

Finding 15

Intercorrelations of Fluency, Flexibility, Originality, and Elaboration scores of the sample produced the following coefficients: Fluency with Flexibility, .7468; Fluency with Originality, .6456; Fluency with Elaboration, .0593; Flexibility with Originality, .7380; Flexibility with Elaboration, .1258; Originality with Elaboration, .1227.

For a comparison between intercorrelations of TTCT variables of this sample with intercorrelations Torrance found for 608 sixth grade pupils in three heterogeneous Michigan communities on the same variables, see Tables 6 and 7. Appendix G includes a correlation matrix of student scores on all variables.

Summary of Teacher and Student Data and Tentative Conclusions

This chapter reported and analyzed data associated with the two hypotheses of the study. Also reported and discussed were exploratory findings not directly related to the two hypotheses but intended to provide information which could give direction for additional investigation.

Of the correlation coefficients calculated for both the teacher and student sample, none indicated extremely strong relationships between
**TABLE 7**

Intercorrelations of Student Scores on the Torrance Tests of Creative Thinking

<table>
<thead>
<tr>
<th>Variable</th>
<th>Flexibility</th>
<th>Originality</th>
<th>Elaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluency</td>
<td>.7468**</td>
<td>.6456**</td>
<td>.0593</td>
</tr>
<tr>
<td>Flexibility</td>
<td></td>
<td>.7380**</td>
<td>.1258*</td>
</tr>
<tr>
<td>Originality</td>
<td></td>
<td></td>
<td>.1227*</td>
</tr>
</tbody>
</table>

N = 303

*p < .05

**p < .01

**TABLE 8**

Intercorrelations of Figural Form A Measures for 608 Sixth Grade Pupils in Three Heterogeneous Michigan Communities

<table>
<thead>
<tr>
<th>Variable</th>
<th>Flexibility</th>
<th>Originality</th>
<th>Elaboration</th>
</tr>
</thead>
<tbody>
<tr>
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<td>.68*</td>
<td>.20*</td>
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<tr>
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<td>.66*</td>
<td>.18*</td>
</tr>
<tr>
<td>Originality</td>
<td></td>
<td></td>
<td>.34*</td>
</tr>
</tbody>
</table>

N = 608

*p < .01
predicted variables. However, evidence presented in this chapter does provide ample justification for additional investigation of certain weak relationships found in this study. Chapter V will outline specific recommendations for additional research in both substantive and procedural areas.

Because the population of both teachers and students used in this investigation was not randomly selected, findings can only be discussed in terms of the specific population of this investigation. Statements about the general population based on the evidence in this investigation is not appropriate. Following are summaries of salient findings associated with the teacher and student sample of this investigation.

Although significant (p < .05) correlation coefficients were produced by correlating A scores on the Kerlinger Education Scale-VI (Progressive educational attitudes) and X scores on the Torrance Ideal Pupil Checklist (the more creative behavioral characteristics to be encouraged and the least creative behavioral characteristics to be discouraged) and by correlating B scores on the ES-VI (Traditional educational attitudes) with Y scores on the TIPC (the least creative behavioral characteristics to be encouraged and the most creative behavioral characteristics to be discouraged), an unqualified acceptance of the first hypothesis could not be made.

The data indicated teachers, in the sample, whose educational attitudes are Progressive tend to feel behaviors considered important for a productive creative personality should be encouraged and teachers whose educational attitudes are Traditional tend to feel behaviors considered not important for creativity should be encouraged. Further, the data
indicated a tendency for teachers in the sample who have taught longer to be more Traditional in their educational attitudes and to feel characteristics not important for a creative personality should be encouraged. Female teachers tend to be more Traditional in their educational attitudes and tend to feel characteristics least important for a creative personality should be encouraged than males in the sample. Finally, the data indicated, for this sample, the more education acquired the less Traditional teachers tend to be in their educational attitudes and the less they tend to feel characteristics least important for a productive creative personality should be encouraged.

The second hypothesis of the study was not supported by the data because none of the predicted relationships between student variables were found to exist at a statistically significant level.

Data related to exploratory findings for the student sample indicated fifth grade students tend to prefer those behaviors considered least important for a productive creative personality. It was also found that fifth grade students in the sample tend to score lower on Fluency, Flexibility, Originality, and Elaboration than fourth grade students in the sample. When differences were compared according to sex, the data indicated female students tend to prefer less those behaviors considered most important for a productive creative personality than males in the sample. Finally, the data indicated female students in the sample tend to score higher on Flexibility and Elaboration than males, a finding consistent with investigations by Torrance.

In conclusion, it must be stated that although the evidence found in this investigation is hardly overwhelmingly compelling, there is
evidence enough to merit continued research along the directions set forth by this investigation. "Even when hypotheses are not confirmed, they have power. Even when 'y' does not covary with 'x', knowledge is advanced. Negative findings are sometimes as important as positive ones, since they cut down the total universe of ignorance and sometimes point up fruitful further hypotheses and lines of investigation."²

The reported findings bear credence to Kerlinger's statement.
CHAPTER V

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS FOR FURTHER RESEARCH

This concluding chapter will synthesize the substantive material presented in the four previous chapters to serve three purposes. First, in order to obtain a comprehensive view of the investigation, a concise summary will reiterate the purposes, theoretical referents, and findings of this investigation. Second, since one of the underlying rationales for educational research is to provide information which leads to the improvement of schooling, educational implications of the findings will be discussed. Finally, recommendations for additional research will be advanced to expand directions suggested by the findings of this study and to give possible future direction for research in learner creativity.

Summary

The purposes of this investigation included (1) to describe relationships, in a teacher sample, which exist between educational attitudes and sanctions of certain student behavioral characteristics; (2) to describe relationships, in a student sample, which exist between preferences for certain behaviors and creative aptitudes; and (3) to report exploratory findings of relationships between certain background information and variables associated with each sample group.

A review of representative literature, both empirical and conceptual, provided additional foundation support for the conceptualizations and assumptions which led to the formulation of the two hypotheses of the study and ultimately to the design of the investigation. Major assumptions underlying the first hypothesis included the assumptions that attitudes
affect behavior; that attitudes can be described along a continuum from
Progressive to Traditional; that educational attitudes are one factor
affecting the sanctions teachers will give toward certain behavioral
characteristics of students. The aforementioned assumptions led to the
formulation of the first hypothesis predicting teachers whose educational
attitude is more reflective of Progressivism will select more creative
behavioral characteristics to be encouraged than teachers whose educa-
tional attitude is reflective of Traditionalism. To a selected sample
of 40 teachers from a small New England school district were administered
the Kerlinger Education Scale VI and the Torrance Ideal Pupil Checklist.
Pearson product-moment correlations indicated evidence in support of the
first hypothesis (ES-A with TIPC, \( \bar{X} .3344 \ p < .05 \); ES-B with TIPC, \( Y, \)
\(-.3435 \ p < .05 \)). An unqualified acceptance of the first hypothesis,
however, could not be made.

Further review of empirical literature indicated consistent perso-
nality characteristics and concomitant behaviors among more creative
individuals; that many behavioral characteristics found among creative
individuals are outside the norm of acceptable behaviors in society and
in educational institutions. The second hypothesis formulated from the
above major assumptions predicted students who score high on creativity
tests will prefer more creative behaviors than students who score low on
creativity tests. To a selected sample of 147 fourth and 156 fifth grade
students from a small New England school district were administered the
Torrance Tests of Creative Thinking and the Ray Creative Behavior Pre-
ference Inventory. Correlation coefficients calculated from Pearson
product-moment correlation procedures indicated very weak relationships
in the direction predicted by the second hypothesis but the data did not support the second hypothesis at a significant level of confidence. One explanation for the data not supporting the second hypothesis is related to an implied assumption inherent in administering the Ray Creative Behavior Preference Inventory. This assumption presumes that preference for certain behaviors resides at a level of conscious knowing which allows one to express the preference. With a construct as complicated as human behavior, it may well be that awareness of a preference for certain behaviors is outside the level of conscious knowing or that conscious knowing of behavioral preference at age 9, 10, or 11 is unreliable. Also factors of response reliability of young children on the RCBPI may have contributed toward the weak correlations calculated. A similar problem, found by Cattell and Butcher, led the authors to suggest that,

The main difficulty in working with questionnaire measures of personality with younger children is that one seems to need more items per factor in order to get the same degree of reliability as with adults, because children appear to be less reliable in their responses. Unfortunately, this need for more items per factor clashes with the need to cut down the length of the total questionnaire with children, in order to get proper attention and freedom from fatigue.  

If this explanation is correct, other means of assessing behavior preferences (observation techniques, for example) might better give an indication of the relationship between behavior and the level of creative potential.

Relationships between educational attitudes and sanctions of certain behaviors were found to exist in the teacher sample according to background
information obtained at the time the two instruments were administered. The background information included the number of years teaching, the grade level now teaching, the number of years teaching the identified grade level, education level, and the sex of the teacher. When subjected to Pearson product-moment correlation procedures, the data indicated a tendency for teachers in the sample who have taught longer to be more traditional in their educational attitudes and to think characteristics not important for a productive creative personality should be encouraged. Further, female teachers of the sample tend to be more traditional in their educational attitudes and also tend to think characteristics not important for a creative personality should be encouraged than males in the sample. Finally, the data indicated, for this sample, teachers who acquire more education tend to be less traditional in their educational attitudes and tend less to think characteristics not important for a productive creative personality should be encouraged.

When scores on the TTCT and the RCPBI of the student sample were subjected to Pearson product-moment correlation procedures according to grade and sex, the data indicated fifth grade students tend to score lower on creativity tests than fourth grade students in the sample. Also, females in the sample tend to prefer less those behaviors considered most important for a productive creative personality than males in the sample. The finding, indicating females tend to score higher on Flexibility and Elaboration, agrees with findings of Torrance.²

Educational Implications

Although the data generated from the sample populations of this study do not permit generalizations to the total populations of either student or teacher group, it would seem, to this writer, speculative
discussion, using the data as a point of departure, is appropriate providing (1) the discussion is explicitly termed speculative; (2) sup-
positions are clearly distinguishable from fact; and (3) that purposes of the speculative discussion are articulated. Following are speculative discussions using the data from this investigation as a point of departure for purposes of generating and advancing implications regarding pre-
and in-service teacher education, student-teacher interaction, and teacher recruitment as these areas of discussion might pertain to fostering crea-
tive development in educational settings.

Within most educational institutions in America, the classroom is the smallest organizational unit (learning environment). The nature of the classroom environment (hostile or nurturant), in terms of human interactions, provides reinforcements which either foster or stifle creative development. Although the development of creative potential is not solely dependent upon the quality of the relationship between the individual and the environment, it must be recognized that this rela-
tionship is one very important factor. Further, recognizing the dispro-
portionate amount of time students spend in the classroom environment compared with other environments in which time is spent, it is advanced that the nature of the classroom environment is one important factor helping to determine the extent to which creative potential is developed in students. Those responsible for the nature of the classroom environ-
ment, to a significant degree, are teachers. Classroom environments can be seen as miniature societal environments in which the dominant force influencing thought and action is the teacher. The teacher's influence on the classroom environment as a whole is unrivaled by any other single
group associated with such environments. The power and authority held by a single teacher in a classroom is nearly sacrosanct.

Given the following set of assumptions—that teacher educational attitudes, along the Progressive-Traditional continuum, affect student-teacher interaction; that teacher educational attitudes will affect the physical and emotional learning environment teachers create for students; that teacher educational attitudes will affect the repertoire of student behaviors teachers will accept, thereby establishing norms of acceptable behavior; and that these three factors, (1) student-teacher interaction; (2) the physical and emotional learning environment; (3) teacher repertoire of acceptable behaviors, are important conditions for creative development in educational settings—certain speculations can be made regarding these factors from the data of this investigation.

Data from this investigation indicated teachers with Progressive educational attitudes tend to think characteristics important for a creative personality should be encouraged. Correspondingly, the data indicated teachers with Traditional attitudes tend to think characteristics not important for a creative personality should be encouraged. When the above findings are reviewed along with findings of Haddon and Lytton, which indicated students from formal schools score lower on divergent thinking tests than students from informal schools, and the findings of Walker, which indicated teachers in high schools providing a positive climate for creativity were less authoritarian in their attitudes than teachers in schools providing a negative climate for creativity, a consistent pattern seems evident. This pattern is characterized as follows: schools that provide environments conducive for creative growth are in-
formal, democratic and the teachers within these schools possess non-
authoritarian, progressive educational attitudes.

If those responsible for designing and implementing teacher prepara-
tion programs are concerned that future teachers from their programs are 
sensitive to and concerned for the development of creativity, then certain 
provisions, suggested by the above data, should be made programmatically 
to attend to the development of creativity. Preparation programs should 
provide current information about the characteristics of creative indivi-
duals, the behaviors often manifested, the cognitive aptitudes associated 
with creativity, and the temperaments and dispositions common among the 
more creative individuals. Considerable attention should focus on the 
complex interplay between attitudes and behavior and the identification 
of those attitudes most compatible with the development of creativity. 
Teachers from preparation programs devoting considerable attention to 
the concerns outlined above will likely be far better equipped to meet 
the demands of fostering creative growth than teachers not exposed to 
such concerns.

Data from this study also indicated the more education teachers ac-
quire the less Traditional their educational attitudes and the less in-
clined they are to encourage behaviors not important for creativity. 
Although the nature of education in the above finding is not specified, 
it would seem building upon this tendency by developing continuous in-
service programs devoted to raising the level of awareness of teachers 
of what kinds of environments are conducive to creative growth, identi-
fying teacher attitudes and behaviors nurturant of creativity, and 
building support systems among teachers to cope with student behaviors
heretofore considered disruptive would do much in developing educational climates which enhance student creativity.

From the studies of Haddon and Lytton, and Walker cited above and data from this investigation, further speculations can be made regarding the nature of teacher-student interaction which contributes toward reinforcing student creative development. It can be speculated that teachers who are less authoritarian and Traditional and more democratic and Progressive in their attitudes will be more likely to foster self-initiated learning and independence in thought and judgment; that teacher evaluative behavior of unusual ideas would stem from a sincere desire to help the student improve upon the idea and not from a desire to control or coerce conformity to behavioral norms.

Finally, for those educational institutions committed to enhancing student creative growth, recruitment procedures which include assessment of educational attitudes of potential teachers will serve as one important criterion of the appropriateness of the candidate.

In summarizing this discussion of educational implications, it must be reiterated that data from this study does not permit generalizations beyond the sample population. However, by using the data, along with data from other relevant investigations as projection clues, speculations were made regarding pre- and in-service teacher education, student-teacher interaction, and teacher recruitment as these factors affect creative development in educational settings. Within the above discussion, the need for further research, to give those associated with educational institutions direction for facilitating learner creativity, is keenly sensed. The following section will outline recommendations which will aid in meeting this need.
Recommendations for Additional Research

This section will recommend directions for further research into learner creativity. The recommendations will be both procedural, focusing on matters of research design, and substantive, focusing on matters of content. The intent of these recommendations is to provide investigative considerations and methods which will provide additional information for facilitating student creative growth in educational settings. Recommendations closely associated with the direction of this study will first be advanced. Subsequent recommendations, although in some cases tangential to the prime consideration of teacher affect on learner creativity, will be advanced to provide further knowledge regarding the phenomenon creativity.

Recommendations Associated with Teacher Affect on Learner Creativity.

It has been asserted that students in classrooms described as authoritarian, teacher directed, and traditional make less gains in creative development than in classrooms described as non-authoritarian (democratic), student centered, and progressive (informal). It is recommended that an investigation, assessing teacher educational attitudes, and level of dogmatism, compare this information with the level of creativity of students. For maximum use of the data, students and teachers should come from the same class. In addition to assessing the teacher variables cited above, the classroom environment of each teacher in the sample should be assessed along the dimensions of degree of authoritarian/non-authoritarian, teacher/student centeredness, and traditional/progressive. It is suggested the sample population be a stratified random sample representing teachers and students from schools of various race and racial mix, socio-economic
level, and urban, sub-urban, rural locations. This information would seek to discover if relationships exist between the teacher and student variables, i.e., teacher educational attitudes, level of dogmatism and student level of creative potential. Further, from this design, relationships between classroom environment and teacher educational attitudes and level of dogmatism and relationships between classroom environment and student level of creativity could be investigated. Data provided by this recommendation and the data from the study just completed by this investigator would add greatly to the knowledge of teacher affect on learner creativity.

A follow-up study to the above recommendation might divide in half those teachers in the sample identified as having Traditional educational attitudes and a high degree of dogmatism to constitute a control and experimental group. The experimental group would then be exposed to an in-service teacher education program on creativity. The in-service program would provide teachers of the experimental group with information about the creative personality and the creative process. Teachers in this in-service program would also identify attitudes and behaviors which foster creativity in students and develop techniques for making classroom environments more conducive to creative growth. After a reasonable period of time, to permit teachers of this experimental group to put into practice the new information and techniques gained from the in-service program, assessments of teacher educational attitudes, level of dogmatism and student level of creative potential should be again made. Changes in any of the measured variables would provide information about the affect of such in-service programs on teacher behavior and student achievement in
creativity.

It is also recommended that the present study just completed be replicated with the following changes: (1) that the sample of teachers and students be randomly selected to be more representative of teachers and students in general; (2) that the Ray Creative Behavior Preference Inventory be expanded and refined to include dispositions, inclinations, and tendencies toward behaviors which teachers may regard as disruptive; and (3) that an item analysis be made of teacher responses to the Ideal Pupil Checklist to determine if patterns exist between responses of teachers with Traditional or Progressive educational attitudes. It is submitted that replication with the above changes will yield more usable data in terms of its generalizability and data with a greater depth of meaning in terms of revealing possible patterns teachers with certain educational attitudes might display.

Recommendations of Research to Advance Knowledge in the Study of Creativity. There is one facet of the study of creativity which has seen little empirical investigation. The motivational characteristics which help explain "why" individuals create still eludes the researcher. It may be recalled, the conceptual definition of creativity used in this study describes creativity as a behavioral process of combining concepts known to the individual which yield a concept new to the individual and meets an internal need upon its completion. Some scholars in the field believe "the roots of creativity do not seem to lie in convergent or divergent thinking but...in the personality and motivational aspects of character." The identification of needs and motivational forces which compel individuals to create would advance the present knowledge
of creativity a hundredfold.

Bits and pieces contributing partial answers to this large question include the findings of Golann (1962), indicating a need of creative individuals for self expression and independence; of Torrance and Dauw (1965), citing a need for excellence and attraction to unusual and unconventional types of achievement; and Pankove (1967), indicating a positive relationship between risk taking and creativity. Barron (1963b) hypothesized that creative individuals have an "exceptionally strong need to find order where none appears." Other motivational factors have been posited but few have been tested empirically. It is recommended that vigorous and sustained research be conducted on motivational factors which are responsible for the need(s) satisfied in the act of creating.

As cited earlier, the most persistent criticism of creativity tests is that the tests measure "certain particular aspects" of creativity and not the universe of creative behaviors. It must be agreed that, at present, creativity tests are not representative of the universe of creative behaviors or aptitudes.

The contributions of Guilford and Torrance of identifying aptitudes associated with creativity and of developing instruments to measure those aptitudes are milestones in the history of research on creativity. New aptitudes must now be identified and new instruments must be developed for measuring other important aptitudes associated with creativity, if a thorough understanding of the phenomenon is to occur. It must be assumed that the number of important aptitudes associated with the creative act is finite. When the point is reached that it can be said "all the evidence
is in," one more aptitude must be identified.

One aptitude for example, which has been recognized as important in the creative process is the ability to free associate or the ability to shift thought matrices. This ability is not to be confused with ideational fluency which presumes a logical connection between the ideas produced and the stimulus. The ability to shift thought matrices presumes no logical relationship between idea and stimulus. The ability to suspend logic and to free associate is the wellspring of originality. I would submit that this aptitude can be quantified and measured at the same level of accuracy as fluency, flexibility, or elaboration. It is therefore recommended that new energy be devoted toward the identification and quantifying of additional important aptitudes associated with the creative process.

Concluding Statement

Critics of the educational profession have cited the seemingly inability of those in the profession to apply knowledge generated through research. The most severe critics maintain the lag between research findings and use of those findings by educators is upwards to fifty years. If this criticism is valid, it is this writer's sincere hope that knowledge generated by this research effort and those efforts recommended above will not become dusty artifacts. Our planet desperately needs the creative potential so abundant in the young. Teachers, who are the closest facilitating agent to the learner, must understand creative potential and develop ways to foster its growth. The first step toward this goal is to acquire new knowledge. Acquiring new knowledge is, however, only the first step. If efforts to facilitate creative growth are to occur,
change must accompany new knowledge—change in attitudes and change in behaviors.
REFERENCES - CHAPTER I


REFERENCES - CHAPTER II


.14. Guilford, J.P. "Factors that Aid and Hinder Creativity," in J.C. Gowan, G.D. Demos, and E.P. Torrance, eds., Creativity: Its Educational Implications, op. cit., p. 120.

.15. Ibid.


.17. Ibid.

.18. Ibid., p. 66


.24. Ibid.


28. Ibid., p. 196.


30. Ibid., pp. 225-226


38. Ibid.


REFERENCES - CHAPTER III


3. Ibid.


5. Ibid., p. 60.


7. Ibid.

8. Ibid., p. 7.

9. Ibid., p. 4.


11. Ibid., p. 223.


15. Ibid., p. 15.


23. Ibid.
REFERENCES - CHAPTER IV

1. Torrance, E.P. Torrance Tests of Creative Thinking: Norms-

REFERENCES - CHAPTER V


2. Torrance, supra op. cit., Chapter III.


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Merrifield, P.R., Guilford, J.P., and Gershon, A. "The Differentiation of Divergent-Production Abilities at the Sixth-Grade Level," Report of the Psychological Laboratory, University of Southern California, No. 27 (Los Angeles), 1963.


APPENDIX A

THE KERLINGER EDUCATION SCALE—VI
EDUCATION SCALE-VI

INSTRUCTIONS: Given below are 46 statements on educational ideas and problems about which we all have beliefs, opinions, and attitudes. We all think differently about such matters, and this scale is an attempt to let you express your beliefs and opinions. Respond to each of the items as follows:

Agree Very Strongly: +3  Disagree Very Strongly: -3
Agree Strongly: +2       Disagree Strongly:  -2
Agree: +1                Disagree: -1

For example, if you agree very strongly with a statement, you would write +3 on the short line preceding the statement, but if you should happen to disagree with it, you would put a -1 in front of it. Respond to each statement as best you can. Go rapidly but carefully. Do not spend too much time on any one statement; try to respond and then go on.

1. Schools of today are neglecting the three R's.
2. The backbone of the school curriculum is subject matter; activities are useful mainly to facilitate the learning of subject matter.
3. Teaching should be based on the present needs of the child.
4. The American public school should take an active part in stimulating social change.
5. The traditional moral standards of our culture should not just be accepted; they should be examined and tested in solving the present problems of students.
6. The curriculum should contain an orderly arrangement of subjects that represent the best of our cultural heritage.
7. The healthy interaction of pupils one with another is just as important in school as the learning of subject matter.
8. The mind of the child must be well trained if it is to perform its function properly later in life.
9. Children should be allowed more freedom than they usually get in the execution of learning activities.
10. Right from the very first grade, teachers must teach the child at his own level and not at the level of the grade he is in.
Learning is essentially a process of increasing one's store of information about the various fields of knowledge.

Many schools waste time and money on fads and frills: activity programs, driver education, swimming pools, social services, and the like.

Education and educational institutions must be sources of new social ideas; education must be a social program undergoing continual reconstruction.

The learning of proper attitudes is often more important than the learning of subject matter.

Learning experiences organized around life experiences rather than around subjects is desirable in our schools.

It is essential for learning and effective work that teachers outline in detail what is to be done and how to go about it.

The true view of education is so arranging learning that the child gradually builds up a storehouse of knowledge that he can use in the future.

Teachers need to be guided in what they are to teach. No individual teacher can be permitted to do as he wishes, especially when it comes to teaching children.

Emotional development and social development are as important in the evaluation of pupil progress as academic achievement.

It is more important that the child learns how to approach and solve problems than it is for him to master the subject matter of the curriculum.

Learning is experimental; the child should be taught to test alternatives before accepting any of them.

The curriculum consists of subject matter to be learned and skills to be acquired.

Each subject and activity should be aimed at developing a particular part of the child's make-up: physical, intellectual, social, moral, or spiritual.

Teachers should encourage pupils to study and criticize our own and other economic systems and practices.

Since life is essentially a struggle, education should emphasize competition and the fair competitive spirit.
26. True discipline springs from interest, motivation, and involvement in live problems.

27. We should fit the curriculum to the child and not the child to the curriculum.

28. The organization of instruction and learning must be centered on universal ideas and truths if education is to be more than passing fads and fancies.

29. Teachers should keep in mind that pupils have to be made to work.

30. Education and educational institutions must be sources of new social ideas.

31. Teachers should be free to teach what they think is right and proper.

32. Schools should teach children dependence on higher moral values.

33. What is needed in the modern classroom is a revival of the authority of the teacher.

34. It is unrealistic to expect education to be like real life; it is more a preparation for life.

35. One of the basic purposes of education is to conserve and transmit the values and standards of the society of which it is a part.

36. The goals of education should be dictated by children's interests and needs, as well as by the larger demands of society.

37. Subjects like communism and capitalism should be studied in the public schools.

38. The modern public school is sacrificing too much of our cultural heritage in its preoccupation with life-adjustment and group living.

39. One of the big difficulties with modern schools is that discipline is often sacrificed to the interests of children.

40. Subjects that sharpen the mind, like mathematics and foreign languages, need greater emphasis in the public school curriculum.

41. Children should be taught that all problems should be subjected to critical and objective scrutiny, including religious, moral, economic, and social problems.
42. The movement to substitute "activities" for subjects in the curriculum of the modern school will operate against the best interests of American education.

43. Standards of work should not be the same for all pupils; they should vary with the pupil.

44. Children need and should have more supervision and discipline than they usually get.

45. Education is not so much imparting knowledge as it is encouraging and prompting the child to use his potentialities for learning.

46. In a democracy, teachers should help students understand not only the meaning of democracy but also the meaning of the ideologies of other political systems.
APPENDIX B

THE TORRANCE IDEAL PUPIL CHECKLIST
IDEAL PUPIL CHECKLIST

Developed by Dr. E. Paul Torrance

To guide a child to the highest fulfillment of his potentialities, what characteristics or behaviors should be encouraged and discouraged? Indicate your ideas, using the list below: (1) Check (√) each characteristic or behavior that you think should be encouraged; (2) Double-check (✓) each characteristic or behavior that you think should be especially encouraged; and (3) Strike through each characteristic or behavior that you think should be discouraged.

<table>
<thead>
<tr>
<th></th>
<th>Characteristic</th>
<th></th>
<th>Characteristic</th>
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<tbody>
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<td>1.</td>
<td>ADVENTUROUS</td>
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<td>OBEDIENT</td>
</tr>
<tr>
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<td>ALTRUISTIC</td>
<td>17.</td>
<td>PERSISTENT</td>
</tr>
<tr>
<td>3.</td>
<td>ALWAYS ASKING QUESTIONS</td>
<td>18.</td>
<td>POPULAR, WELL LIKED BY PEERS</td>
</tr>
<tr>
<td>4.</td>
<td>A SELF-STARTER</td>
<td>19.</td>
<td>QUIET</td>
</tr>
<tr>
<td>5.</td>
<td>BASHFUL</td>
<td>20.</td>
<td>RESERVED</td>
</tr>
<tr>
<td>6.</td>
<td>BECOMES PREOCCUPIED WITH TASKS</td>
<td>21.</td>
<td>SELF-CONFIDENT</td>
</tr>
<tr>
<td>7.</td>
<td>COURAGEOUS IN CONVICTIONS</td>
<td>22.</td>
<td>STRIVES FOR Distant GOALS</td>
</tr>
<tr>
<td>8.</td>
<td>COURTEOUS</td>
<td>23.</td>
<td>STUBBORN</td>
</tr>
<tr>
<td>9.</td>
<td>CURIOUS</td>
<td>24.</td>
<td>SOPHISTICATED</td>
</tr>
<tr>
<td>10.</td>
<td>DOES WORK ON TIME</td>
<td>25.</td>
<td>TALKATIVE</td>
</tr>
<tr>
<td>11.</td>
<td>DOMINEERING</td>
<td>26.</td>
<td>TIMID</td>
</tr>
<tr>
<td>12.</td>
<td>HAUGHTY AND SELF-SATISFIED</td>
<td>27.</td>
<td>UNWILLING TO ACCEPT SAY-SO</td>
</tr>
<tr>
<td>13.</td>
<td>INDEPENDENT IN JUDGMENT</td>
<td>28.</td>
<td>VISIONARY</td>
</tr>
<tr>
<td>14.</td>
<td>INDEPENDENT</td>
<td>29.</td>
<td>WILLING TO TAKE RISKS</td>
</tr>
<tr>
<td>15.</td>
<td>INTUITIVE</td>
<td>30.</td>
<td>WILLING TO ACCEPT JUDGMENTS OF AUTHORITIES</td>
</tr>
</tbody>
</table>
APPENDIX C

THE RAY CREATIVE BEHAVIOR PREFERENCE INVENTORY
Dear Student,

We are interested in finding out what students your age are like. There are 60 sentences in this booklet. Since each student is different, there will be different answers to each sentence. There are no right or wrong answers because this is not a test. Your answers will help us to learn more about students like you if you answer very honestly. No-one will know your answers because we are not asking your name.

INSTRUCTIONS:

Some of the sentences in this booklet might be about YOU! If you think the sentence is talking about you, put an 'X' in the box under YES. If the sentence is NOT talking about you, then put an 'X' in the box under NO.

Below are two SAMPLE sentences. Let's try them before turning the page.

1. I AM A GIRL AND GIRLS ARE SMARTER THAN BOYS.

   YES   NO
   □     □

2. I NEVER LOOK AT TELEVISION, I WOULD RATHER READ A BOOK.

   YES   NO
   □     □

Read each sentence carefully but don't spend too much time on any one sentence.
1. Sometimes I'm so busy working on a problem I don't even know what time it is.
2. Meeting strangers frightens me.
3. Most of the time, I try to make people do things my way.
4. I talk too much, but that's O.K.
5. I do my own thinking, without help from anyone.
6. I will work hard to do something very important when I get older.
7. I ask a lot of questions because you learn a lot that way.
8. Making friends is hard for me because I'm not very important.
9. Even though my friends don't like what I say, I'll still say it if I think it's right.
10. People say I talk a lot and I agree.
11. When we play games I always try to be the leader.
12. I know that I am right sometimes and I don't know why.
13. There is no need for me to get smarter, I like myself just as I am.
14. I take things apart to see how they work.
15. I know more about life than people twice as old as I am.
16. If somebody says it is so, I believe it.
17. I keep my feelings to myself.
<table>
<thead>
<tr>
<th></th>
<th><strong>Question</strong></th>
<th><strong>Yes</strong></th>
<th><strong>No</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>18.</td>
<td>Sometimes I do things even though I know the teacher may not approve.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>I make up my own mind, without letting other people decide for me.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>I do things even though I'm not always sure how it will end up.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>I keep my ideas even if somebody doesn't like them.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>I plan ahead and then work hard to see that what I plan comes true.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>I almost always accept what teachers say, they are usually right.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>I try not to get into other people's way.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>I would give the poor most of my money, if I were rich.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>I start a lot of things on my own, without anybody helping me.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>I don't talk to people I don't know.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>When I start something I stay with it until I finish, even though people say I should give up.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>I am always trying to find answers to my questions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>I think up some wild ideas sometimes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td>I usually don't need someone to tell me what to do, I can figure it out for myself.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>I always do as I am told.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>Other people are more important than I am.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
34. I never give up, even when I know I should.
35. I am almost never late with my homework.
36. I am so quiet, people hardly notice me.
37. I can do anything I really want to do.
38. Everybody in my class likes me.
39. Sometimes people try to tell me what to decide, but I don't let them.
40. Many times I feel the answer is right without thinking about it.
41. If I don't understand something I ask why.
42. Adults are almost always right.
43. I always give in because I don't like to argue.
44. I try out lots of new things, even if I might fail.
45. I am rarely surprised by anything I see or read.
46. I believe everything I hear or read.
47. Often when I'm busy, I forget that other people are around.
48. I always want to win, whether I'm right or wrong.
49. I try never to hurt other peoples' feelings.
50. I rely on my own thinking and don't let others try to tell me what to think.
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>51.</td>
<td>I give up easily when I get stuck on a problem.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52.</td>
<td>I keep what I'm thinking to myself.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>53.</td>
<td>Even though I don't have very much, I share what I have with others.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>54.</td>
<td>I don't have to study as much as other people in the class.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55.</td>
<td>I think up many ideas my friends say are silly.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>56.</td>
<td>I often do things that take a lot of courage; I like adventure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>57.</td>
<td>My assignments are always handed in on time.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>58.</td>
<td>I am always polite to other people, even if I don't like them.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>59.</td>
<td>When I am in a difficult spot, I rely on myself.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60.</td>
<td>I have a lot of friends in my class and they are always asking me to help them.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX D

MEANS AND STANDARD DEVIATIONS OF TEACHER SCORES
ON THE TORRANCE IDEAL PUPIL CHECKLIST AND
THE KERLINGER EDUCATION SCALE-VI
Means and Standard Deviations of Teacher Scores on the Torrance Ideal Pupil Checklist and the Kerlinger Education Scale-VI

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIPC, X</td>
<td>36.4000</td>
<td>8.6345</td>
</tr>
<tr>
<td>TIPC, Y</td>
<td>-6.8750</td>
<td>7.3282</td>
</tr>
<tr>
<td>ES-A</td>
<td>12.3200</td>
<td>1.6647</td>
</tr>
<tr>
<td>ES-B</td>
<td>9.6300</td>
<td>2.1426</td>
</tr>
<tr>
<td>ES-A minus B</td>
<td>2.6875</td>
<td>2.7340</td>
</tr>
</tbody>
</table>

N = 40
APPENDIX E

MEANS AND STANDARD DEVIATIONS OF STUDENT SCORES
ON THE RAY CREATIVE BEHAVIOR PREFERENCE
INVENTORY AND THE TORRANCE TESTS
OF CREATIVE THINKING
Means and Standard Deviations of Student Scores on the Ray Creative Behavior Preference Inventory and the Torrance Tests of Creative Thinking

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCBPI, X</td>
<td>40.4059</td>
<td>7.7547</td>
</tr>
<tr>
<td>RCBPI, Y</td>
<td>30.6106</td>
<td>7.3988</td>
</tr>
<tr>
<td>TTCT, Fluency</td>
<td>21.4191</td>
<td>6.9649</td>
</tr>
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<td>TTCT, Flexibility</td>
<td>16.2475</td>
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<td>TTCT, Originality</td>
<td>27.6370</td>
<td>10.4149</td>
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<tr>
<td>TTCT, Elaboration</td>
<td>57.2772</td>
<td>24.0035</td>
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</tbody>
</table>

N = 303
APPENDIX F

CORRELATION MATRIX FOR TEACHER SCORES ON ALL VARIABLES
### Correlation Matrix of Teacher Scores on the Kerlinger Education Scale-VI, the Torrance Ideal Pupil Checklist, and Teacher Profile Data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Grade level teaching</th>
<th>Years teaching level</th>
<th>Education level</th>
<th>Sex M=1 F=2</th>
<th>TIPC, X</th>
<th>TIPC, Y</th>
<th>ES-A</th>
<th>ES-B</th>
<th>ES-A minus B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years teaching</td>
<td>-.2208</td>
<td>.6312**</td>
<td>-.0153</td>
<td>.3705*</td>
<td>-.0625</td>
<td>.1727</td>
<td>-.2002</td>
<td>.1095</td>
<td>-.2070</td>
</tr>
<tr>
<td>Grade level teaching</td>
<td>-.2047</td>
<td>.0385</td>
<td>-.1990</td>
<td>-.0094</td>
<td>.1496</td>
<td>.1529</td>
<td>-.2241</td>
<td>.2696</td>
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<tr>
<td>Years teaching grade level</td>
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<td>.2391</td>
<td>.0249</td>
<td>.0129</td>
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<td></td>
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<tr>
<td>Education level</td>
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<td>.0737</td>
<td>.3676*</td>
<td>.0311</td>
<td>-.2439</td>
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<td>Sex, M=1 F=2</td>
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<td>-.1424</td>
<td>.3925*</td>
<td>-.3928*</td>
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<tr>
<td>TIPC, X</td>
<td></td>
<td></td>
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<td>1.1443</td>
<td>.3344*</td>
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<tr>
<td>TIPC, Y</td>
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<td>-.0975</td>
<td>-.3435*</td>
<td>.2096</td>
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<td>.210**</td>
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<tr>
<td>ES-A</td>
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<td>-.0153</td>
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<td>.6210**</td>
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<tr>
<td>ES-B</td>
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<td></td>
<td></td>
<td></td>
<td>-.7931**</td>
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</table>

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*p < .05
**p < .01
APPENDIX G

CORRELATION MATRIX FOR STUDENT SCORES ON ALL VARIABLES
Correlation Matrix of Student Scores on the Torrance Tests of Creative Thinking, the Ray Creative Behavior Preference Inventory, and Student Profile Data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Grade</th>
<th>Sex</th>
<th>School</th>
<th>CBPI, X</th>
<th>CBPI, Y</th>
<th>TTCT, Fluency</th>
<th>TTCT, Flexibility</th>
<th>TTCT, Originality</th>
<th>TTCT, Elaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td>.6377**</td>
<td>-.1006</td>
<td>.0312</td>
<td>-.0259</td>
<td>-.1471*</td>
<td>-.0843</td>
<td>-.1300*</td>
<td>-.1099</td>
<td>-.0736</td>
</tr>
<tr>
<td>Grade</td>
<td>-.0370</td>
<td>.0659</td>
<td>-.0080</td>
<td>-.2577**</td>
<td>-.1609**</td>
<td>-.1068</td>
<td>-.0999</td>
<td>.0052</td>
<td></td>
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<tr>
<td>Sex, M=1 F=2</td>
<td>.0248</td>
<td>-.1910**</td>
<td>.0486</td>
<td>.1045</td>
<td>.1181*</td>
<td>.0713</td>
<td>.1157*</td>
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<td></td>
</tr>
<tr>
<td>School</td>
<td>-.0319</td>
<td>.0249</td>
<td>.1639**</td>
<td>.1727**</td>
<td>.1175*</td>
<td>.0317</td>
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<tr>
<td>CBPI, X</td>
<td>-.2240**</td>
<td>-.1129</td>
<td>-.0891</td>
<td>-.1010</td>
<td>.0534</td>
<td></td>
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</tr>
<tr>
<td>CBPI, Y</td>
<td></td>
<td></td>
<td>.7468**</td>
<td>.6456**</td>
<td>.0593</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>TTCT, Fluency</td>
<td></td>
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<td>.7380**</td>
<td>.1258*</td>
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<tr>
<td>TTCT, Flexibility</td>
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<td></td>
<td></td>
<td>.1227*</td>
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<tr>
<td>TTCT, Originality</td>
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*p .05
**p .01