

A STUDY OF THE EFFECT OF A CREATIVE WRITING
TREATMENT ON CREATIVITY UNDER DIFFERENT
SITUATIONAL CONDITIONS

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ABSTRACT

This is a study of creativity using the assessment instruments and creativity definition developed by E. P. Torrance. Creativity is recognized as an essential ability and a logical place to nurture this ability is within the realm of elementary education.

This study was designed to learn whether a creative writing treatment of six assignments administered to all students in an experimental group would affect the verbal or nonverbal creativity of the students. Control and experimental groups of seventy-one children each were established from a population of predominantly white middle class fourth, fifth, and sixth grade students who attend a pod school. A further design of the study was that the experimental group be composed of three subgroups of twenty-four students which functioned under time conditions of thirty, sixty, and ninety minutes and three subgroups of twenty-four students which functioned in space conditions of a pod, an individually chosen place, or a self-contained room.

Results: The Torrance Tests of Creative Thinking Verbal Form A and Figural Form B were administered to the control and experimental groups. The mean scores of the

experimental group were significantly higher than the control group, but no difference was seen in the mean scores of the two groups on the Figural Test. When a criterion of fluency was used with regard to the different subgroups, the mean scores for the pod groups proved to be significantly higher than the other two subgroups. Similar results were obtained for the space conditions when a criterion of originality was used. When the criteria of fluency and originality were applied to the time conditions, it was indicated that the thirty minute time period was optimal. A chart was made for observational purposes of the time-space interaction effects with the sixty minute time condition and the pod space condition appearing to be optimal.

Summary: Indications are that a creative writing treatment does affect verbal but not nonverbal creativity. It would also appear that time and space conditions influence the fluency and originality factors of creativity. Further studies are recommended in this area and in the area of developing creativity tests for teachers.

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Chapter 1

INTRODUCTION

General Statement of the Problem

Creativity is no longer a concept associated exclusively with the fine arts and a selected few gifted people. It is now seen as a way of being, a process as well as a product, and something applicable to most if not all facets of living. It is thought to be a necessary element in the development of a fully functioning person (Rogers 1962). Such a fully functioning person lives with an openness to his world. He is one who engages in creative living by trusting in his ability to develop new relationships with his environment.

People today, particularly children, must be guided toward a way of living which will enable them to live in an increasingly complex world. No one can possibly foresee the knowledge that will be needed ten or twenty years from now. It is thought, therefore, that it is only possible to equip individuals with the attitudes and abilities which will allow them to handle future problems in a creative manner (Parnes, 1967).

The product is no longer viewed as the sole evidence of creativity (ASCD, 1962). The process, in fact, is

considered by some to be far more important than the product (Rasey, 1956). A decision can be made in a creative manner. Relationships can be developed creatively. Problems can be solved and ideas brought forth as a result of creative thinking. In light of this kind of thinking about creativity, education cannot restrict itself to rote learning any longer. Creativity involves mental processes which must be recognized and developed. The ability to change one's approach to a problem, for example, is an ability relevant to creative thinking and imperative if one is to function in the ways previously mentioned. In the same vein as changing the approach to a problem is the ability to produce relevant but unusual ideas; and to see beyond an immediate situation. These and the ability to redefine a problem or a particular aspect of it are seen as absolute necessities. In order to achieve something more than a superficial education, these processes must be taught (Kneller, 1967).

Creativity cannot be thought of in terms of fine arts only. Creative behavior in the realms of both aesthetics and science are believed to have a common facility in the rearrangement of elements previously experienced (Broudy, 1951). It is this common facility which must be nurtured and developed.

It is believed that the focus in education must shift from the types of materials taught to personality development. Persons must not be taught a passive kind of adjust-

ment, but a constructive way of responding to the environment (Torrance and Meyers, 1970). The psychology of adaptive living through rote learning will not provide students with the tools necessary for existence in a world of constantly increasing knowledge and complexity.

With the growing awareness of the need for creativity has come the problem of how, when, and where it should be nurtured. Something which carries the potency that creativity does cannot be left to chance. Since it is undoubtedly of value to more than the potential artist or writer, it would seem necessary that everyone should be given the opportunity to nurture and develop his innate creativity.

One of the factors to be considered in dealing with creativity is the evidence that much of it is lost at an early age and a trend is established in which creativity is gradually diminished to a point where it is almost non-existent in adults. There are indications that this downward trend of creative behavior begins as early as age five (Andrews, 1930). The spontaneous, imaginative and adventuresome behavior exhibited by children has been found wanting in the uncreative behavior of adults (ASCD, 1962). The universality of creativity in childhood can be contrasted to the almost non-existence of the trait in adulthood.

A pattern appears to exist in which children by the age of five years lose a good deal of their active imagination, curiosity, and excitement about learning. At nine

years of age, even fewer of these characteristics are apparent, and at the age at which children begin junior high school, still fewer can be observed (Torrance and Meyers, 1970).

If this pattern were in evidence in all cultures, we would perhaps need to accept it as inevitable. This is not the case, however. Margaret Mead in studying the behavior of the people of Samoa found that creativity steadily increased with age (1939).

The problem of creativity has come to be thought of by many as qualitative rather than quantitative (Hallman, 1963; Kneller, 1967; Parnes and Noller, 1971). The potential for creativity exists in everyone at birth. The amount of potential may not be the same for everyone, but it is thought that much of the observed differences among people is caused by unrealized inherent potential, not by natural limitations (Arnold, 1962). Guilford acknowledges that heredity undoubtedly sets limitations upon creative ability, but believes that it is possible to extend creative skills within those limitations (1952).

We see that creative capacities are either potentially or actually existent in all individuals, and generally desirable to everyone. Although desirable, they are apparent in very young children but rarely found in adults. The problem, then, is to learn what happens between childhood and adulthood that makes people cease to function in a

creative manner.

The question of nurturing or inhibiting creativity has not always been seen as a problem. A traditional line of thinking is that creativity will flourish in spite of neglect or suppression. This idea is rejected by Torrance, among others, who states that the development and functioning of the creative process is very sensitive to the manner in which the environment responds to a person's creative needs (1971). If creative behavior were immune to environmental influences, we should find all cultures and periods of time with a relatively equal amount of creative production. We of course know this is not the case. Italy, during the Renaissance, is just one example of time and place where creativity thrived to a degree seldom duplicated in history. There are many people in the fields of education and psychology who believe that creative functioning can be nurtured or inhibited by general conditions or circumstances associated with time and place. Hallman, for example, has observed that creativity can be encouraged as well as inhibited although it cannot be deliberately controlled (1967a).

It is thought by some that the creative factors of intellect are even more susceptible to environmental influences than the cognitive-memory factors (Gowan, 1967). The ways of inhibiting or nurturing creativity are numerous. One way is through the climate or atmosphere in which a person functions. It may be possible to bring about an

atmosphere which facilitates and maximizes the possibility that creative behavior will occur (Hacker, 1965). The elements of time, space, and size may be crucial in aiding or stifling creativity. If they are important factors, they must be recognized and manipulated. To ignore them would be to risk neutralizing any other manipulations such as creative thinking training.

Since the years during which creative activity diminishes in most individuals coincides with the years spent in school, it is logical that we look to school as a place where we might begin to deal with the problem. It is thought by some that it is very definitely the school's responsibility to begin working with children at an elementary level when they are most impressionable (Marksberry, 1963). A reasonable place to initiate a program designed to nurture creative development would be in the upper elementary grades where children are considered to have a greater degree of personal motivation and initiative (Thomas and Feldhusen, 1971). There is an additional reason for bringing creativity into these grades. It has been shown that some children learn better when teaching methods require creative thinking by the student rather than acceptance of material presented authoritatively (Torrance, 1967). Torrance's work has indicated that some children not only learn more effectively but more economically under conditions of creative teaching methods. Others have corroborated the findings that

creative learning can be more economical (Ornstein, 1959; Moore, 1961).

The decision to deal with the problem of creative development within the schools is the first and probably the easiest step. Immediately a roadblock is encountered in that a creative environment is the opposite of an ordered environment which is the usual teaching mode (Maslow, 1959). It has been pointed out that the traditional atmosphere which exists in the classroom definitely stifles internal responses one might make to the world (Hopkins, 1956). Pressure is continually put upon a child to take what is presented to him and return it to the teacher in an acceptable form. Docile behavior has traditionally been rewarded. These things coupled with teacher rigidity have had a stultifying effect upon the individual and creative activity.

It is obvious that schools must basically be built around structure and order. Many factors influence the type of physical structure necessary to carry out the education of a large number of children. Likewise, the use made of time within school is influenced by a number of considerations. Starting and stopping times are precisely established. Recess time is established by law and structured by administrators. Policies dictate the number of minutes to be devoted to each academic area. Not only is there a clock orientation, but the emphasis is often on speed (Torrance, 1971).

Despite the fact that we must accept as inevitable a certain amount of physical and temporal structure, we cannot ignore the influence of these elements. We know that spatial considerations influence all social systems and education is no exception (Loomis, 1960). Esser tells us that space cannot be treated as an abstract vacuum, but is a part of our tacit knowledge (1971). The tendency to rush is a factor which puts the educational system and creativity at odds with one another (Kubie, 1967).

The fact that it is unlikely that the basic structure of schools will change in the near future does not mean that the problem of temporal and spatial influences on creativity should be ignored. Rather, we must find ways in which we can change the existing situation enough so that an atmosphere conducive to creative thinking can exist. It is conceivable that in order to maintain an atmosphere totally conducive to creativity, drastic changes would have to be made. This is not what is being looked for in this paper. Rather it addresses itself to the need of information about what can be done within present systems to make creative thinking possible. It is apparent, then, that considerations of time and space can no longer be peripheral. The use of time and space are important factors and must be of primary importance (ASCD, 1962).

Although such factors as curriculum and teaching techniques are of equal importance with time and space in

developing creativity within schools, the scope of this paper will be limited to time and space factors which influence creativity. Of the 142 research experiments reviewed by Torrance (1972) in an article, not one of the articles cited considered the problem of time or space conditions in hindering or enhancing creative behavior. This study will focus on practical ways of manipulating time and space within existing elementary schools in order to achieve creative atmosphere which neither totally upsets nor presents insurmountable problems to the teacher.

Educators have been accused of not doing enough to help the creative development of children (MacKinnon, 1971). While a recent increase in the interest in creativity can be seen, a great deal of the research done has involved adolescents or young adults. Torrance has developed one of the few creativity tests available for use with children at the elementary level (Kaltsounis, 1971). The convenience of using older persons as subjects in creativity research is understandable. There would appear, however, to be a need to obtain information about creativity from children.

One attempt at making a differently structured environment in elementary schools has been through the construction of pod or open space schools. It was observed, however, by the author and many other teachers at one pod school that creative thinking by students did not necessarily or automatically emanate from these new

physical arrangements. With this need for data on time and space in a focus, this research study reports the results of one attempt to facilitate creative writing through a project in which the treatment was kept constant while time and space conditions were varied, thus allowing tests as to whether time and/or space conditions influence measured creativity.

Background of the Problem

Until 1950, almost no research was done on creativity or related areas (Guilford, 1950). Since then, there has been a sharp increase in the amount of work done in the field. The number of factors involved in this area, however, have caused the research to be spread over a wide area. Studies have been done, for example, on personality traits of creative individuals (Barron, 1955), on the relationship of I.Q. to creative giftedness (Getzels and Jackson, 1962), and on the use of training techniques for increasing originality responses (Maltzman, Bogartz, and Breger, 1958). Such a multifaceted attack on the problem has caused the amount of research to be spread very thin in many areas. There is, as a result, a great deal more to be accomplished.

The problem of how to elicit creative behavior from children in a structured school environment has not been dealt with in any concerted fashion. Teachers have long

been aware of the fact that a creative writing class has little chance of developing a child's creative capacities when sandwiched between two highly structured classes such as math and science, especially when it must be conducted in basically the same way as the math and science classes. Despite the awareness of this, little information has been gathered on the subject which can aid teachers in developing an atmosphere which can enhance the probability that a creative writing class will be successful in nurturing creativity.

Significance of the Problem

Volumes have been written about teachers and curriculum. The learning environment has been extensively examined in terms of what the furniture should be like or how bulletin boards displayed. Current interest in creativity research has also looked for such things as methods of teaching creativity, ways a teacher should respond to students, and internal feelings of creative people. Very little effort has been made to examine the conditions of time and space that foster or hinder the creative processes. In light of the importance of time and space to the establishment of basic conditions in schools and their pervasive nature throughout the system, if any significant progress is to be made in the development of creative capacities within the schools, information about these

time and space conditions has to be gathered. We must seek to uncover and explicate ways in which time and space can be arranged to support or inhibit the development of creativity.

Chapter 2

REVIEW OF PERTINENT LITERATURE

The first theories of creativity were developed under the realm of philosophy. Ancient philosophers like Plato attributed creativity to divine inspiration (Jowett, 1937). As such, creativity was not thought to actually come from the individual, rather it was merely manifest through him. The next theory to be developed was one that Hallman refers to as the "neuroticism" theory (1964). This was the belief that persons displaying creative behavior were insane. The major contribution of this theory was that it took a step toward the acceptance of creativity as existing within the person. Kant discussed a third theory of creativity (1911). His thinking was that creativity was a gift of genius found rarely in human beings. With this theory came the belief that creativity was a natural process; however, Kant believed it to be nonrational and in possession of its own laws. Thus, none of these theories described creativity as something educable.

The development of psychological theories of creativity brought creativity into the range of the educable. In psychoanalytic theory, Freud considered it natural and a part of the unconscious mind, although having the same source

as neurosis (Kneller, 1967). Neopsychoanalytic theories generally related it to the preconscious mind (Kubie, 1961).

The most recent step in the evolution of theory of creativity came from psychologists like Maslow (1959) and Barron (1963) who not only consider it a natural human process but a healthy one.

J. P. Guilford has developed what is probably the most extensive theory of creativity (1968). He has posited 120 of what he calls factors of intellect. He has identified nearly half of these factors and places each in one of two main classifications. The larger of these classifications, thinking abilities, is divided into categories of productive, cognitive, and evaluative abilities. Productive abilities are further subdivided into convergent and divergent thinking. There are eleven factors listed under the category of divergent thinking. Guilford believes that these plus two factors of convergent thinking and one factor of evaluation are involved in creativity.

One of the first attempts to deal experimentally with the problem of nurturing creativity was made by Royce (1898). His research led him to the conclusion that instructional techniques could be devised to facilitate creative thinking. Using Royce's work as a basis, several others have developed training methods which appear to effectively increase thinking in a creative manner (Maltzman, Bogartz, and Breger, 1958; Osborn, 1957; Parnes and Meadow,

1960). Most of this research has primarily involved people of college age or older.

Others interested in the subject have concentrated on either general personality traits or internal conditions related to creativity. In terms of the former, Barron has researched and written a great deal. By studying the personality characteristics of identified creative adults, he has developed a list of traits which can be indicative of a creative personality. Alamshah (1967) is an example of an author who has focused on the internal conditions necessary for creative behavior.

With so much being written about the many facets of creativity, some have attempted to compile summaries of various areas being studied. Anderson (1959), ASCD (1962), and Gowan (1967) have produced works of this type.

While interest in the concept of time in young children has existed for a number of years (Bonaparte, 1940; Bromberg, 1938), and the subject of time has been treated by scholars in many different fields, relatively little has been treated in terms of time and creativity. Regarding the main focus of this paper, Ornstein, during the past few years, has made an attempt to bring the time factor into the mainstream of work done on cognition and perception (1969). He conducted a series of experiments on processing, attention, and memory. At least one fairly recent attempt (Fraser, 1966) has been made to gather together much of the current

knowledge about time.

The literature on time in its relationship with learning and specifically creativity is slim, however. It has been stated that while learning has been analyzed in terms of retention and content, few if any attempts have been made to define the basic temporal concept involved in learning (Elman, 1971). Khatena has one of the few articles which describes research conducted in an attempt to determine whether or not time is a factor in producing creative responses (1971). The factors of time and working instructions were combined in another series of experiments (Christensen, Guilford, and Wilson, 1957), but in general, the subject of time and its relationship to the context of creativity has not been explored.

Although the extent of the literature on time is limited, the amount of literature on space in relationship to creative behavior is even less. Little, if any work has been done in an attempt to define the actual influence space has upon creativity. While general works on spatial concepts do exist, they have little direct bearing on this specific subject.

The amount of literature directly related to this study is scant. One of the few to look at creativity in young children was Andrews (1930) whose work focused on the loss of creativity in children at an early age.

E. P. Torrance has done some of the most extensive work on

creativity with elementary age children. He has designed experiments, for example, which involve teaching principles that help children in the primary grades to produce more creative ideas (1961). He has also developed one of the few creativity assessment instruments which can be administered to elementary age children (1966).

In addition to these, Torrance has written a great deal about the type of classroom situation necessary for creativity (Torrance and Meyer, 1970; Torrance, 1965). Brown (1964, 1965) and Haddon and Lytton (1968) have also conducted research experiments designed to learn more about the teaching of creativity within a classroom setting. Brown's work has been centered around a theory of "sub selves". Still other work has been in the area of creative behavior and the influences of anticipated classroom activities (Elkind, Deblinger, and Adler, 1970).

The importance and pervasiveness of time and space in creativity can therefore be viewed in light of the fact that very little literature on the subject exists. The background information for this study will come primarily from Torrance (1962, 1963, 1964, 1965) whose definition of creativity and assessment instruments will be used, and Hallman (1963, 1964, 1967a, 1967b) whose works, although not directly supported by research, emphasize the importance of time and space conditions.

Although it is difficult to find literature describing

the treatment of time and space conditions of creativity, works discussing the treatment of creative writing in terms of classroom environment can be located. Goodale (1970) discusses the kind of classroom setting and teaching techniques required to produce an atmosphere conducive to imaginative creative writing. The characteristics of most importance to a teacher in establishing a good climate for creativity are described by Moustakas (1967) and Ellis (1972).

Chapter 3

DESIGN AND PROCEDURES

Specific Statement of the Problem

The problem of this study is to determine whether certain conditions of time and space differentially influence the creativity of different groups of fourth, fifth, and sixth grade students who all engage in the same treatment designed to teach creative writing.

Definition of Terms

The definition of creativity used in this study is one given by Torrance who defines it as

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

Time in this study is defined as the number of minutes allowed to complete a creative writing assignment.

Space in this study is defined as the type of physical structure in which the assignment was completed.

A pod is a structure housing more than one classroom with no separations between the rooms.

A self-contained classroom is a room completely closed in which only one class normally functions.

Methodology

Grouping. The experiment was conducted using seventy-one children in the control group and seventy-one children in the experimental group. The control group was divided into nine subgroups of eight children each. A subgroup of eight was chosen because the literature indicated (Sorokin, 1947) that eight is an optimal number for a group and that a smaller number than eight would have too great an emphasis on the subjective, and that a group of thirty, the normal class size would have too great tendency toward the objective.

Time. Since the purpose of this study was to gather information about creativity that would be of use in a classroom, the time variable was designed in units manageable in an elementary school. Time units of thirty, sixty and ninety minutes were used. Three of the subgroups, approximately twenty-four students were placed in each of the three time periods.

Space. In setting up the condition of space, students in three groups were assigned to work individually in an area of their own choosing; three groups were assigned to a self-contained room; and three groups were assigned to

a classroom within a pod school.

Size. It would also have been preferable to introduce size as a variable as well as time and space in this experiment. In order to accomplish this, twenty-seven subgroups would have to have been established. That would have necessitated the involvement of too large a number of children and presented insurmountable problems of carrying out the experiment without considerably disrupting usual school activities.

Although establishing a third variable was not practical, it was possible to set up three such variables and randomly assign them to the nine subgroups in such a manner that each of the three time units were distributed across all three of the size units, and each of the space units were distributed across all three units of size. The size units were one to one, one to eight, and one to thirty. The one to one variable means that the student worked by himself with the teacher. The one to eight unit means that the students worked in a group of eight with the teacher with no other students in the area. The one to thirty ratio indicated that the students worked with the teacher within a classroom of approximately thirty children. By employing the size factor in a limited way, the possibility of learning the optimal time, space and size combination was eliminated, but it was hoped that some information

could be gathered from it about the interaction of these three factors.

Treatment factors. Certain treatment factors were held constant. The first factor held constant was the days on which creative writing was taught. All of the creative writing groups were conducted on either Tuesday or Wednesday. It was thought that on Mondays children tend to be less alert. The Thursdays at the school at which the study was conducted were unusual because the school operated that day on a minimum day schedule. Fridays were also eliminated because activities such as art were usually conducted then.

Two other factors held constant were the teacher and the assignments. The same teacher conducted all nine groups. The same assignment was presented in as similar a manner as possible to all of the groups. In each group a great deal of effort was made to establish a comfortable atmosphere for the students. It was emphasized that ideas were important and that the children should not be overly concerned with spelling and grammar. The teacher was available to answer questions throughout the period. The children were also allowed to receive help with spelling and grammar from other students.

Assignments. The creative writing assignments were chosen for interest and variety. Each lesson was independent of the others, and there was a flexible and varied

order in which the lessons were presented.

Negative responses to any child's creative writing were kept at a minimum. An attempt was also made to prevent any differentiation between boys and girls, because it has been pointed out that entire ways of experiencing are eliminated when that differentiation occurs (Torrance, 1965).

When describing each creative writing assignment, few if any examples were given. It was felt that when examples are given, the children tend to be less open in their own thinking and are inclined to closely follow the illustration.

Hypotheses Tested

The hypotheses tested can be grouped in two parts. The first considers the question of whether the treatment totally affected the students' performance either verbally or nonverbally. The second group of hypotheses is concerned with effects of specific variables and the interaction of these variables on subgroups within the total experimental group.

Treatment and control. There will be no significant difference in the verbal abilities of the experimental and control groups as indicated by the scores obtained on the Torrance Tests of Creative Thinking, Verbal Test A.

There will be no significant difference in the non-

verbal performance among the three groups of twenty-four students who worked under different conditions of time as indicated by the scores obtained on the Torrance Tests of Creative Thinking, Figural Test B.

There will be no significant difference in the verbal performance among the three groups of twenty-four students who worked under different conditions of space as indicated by the scores obtained on the Torrance Tests of Creative Thinking, Verbal Test A.

There will be no significant difference in the non-verbal performance among the three groups of twenty-four students who worked under different conditions of space as indicated by the scores obtained on the Torrance Tests of Creative Thinking, Figural Test B.

There will be no significant difference in the verbal performance among the nine groups of eight students who worked under different conditions of time and space as indicated by the scores obtained on the Torrance Tests of Creative Thinking, Verbal Test A.

There will be no significant differences in the non-verbal performance among the nine groups of eight students who worked under different conditions of time and space as indicated by the scores obtained on the Torrance Tests of Creative Thinking, Figural Test B.

Population and Sample

The children involved in this study were fourth, fifth, and sixth grade students at a predominantly white, middle class, suburban school. The total population of the school was approximately 430, of which approximately 180 were in the intermediate grades. As a pod school, there were six intermediate classroom areas in the building. Each class contained fourth, fifth, and sixth graders in approximately equal numbers. These areas were divided into triads. The children had been assigned to triads and classrooms on a random basis. It was assumed, therefore, that the students in each triad were of generally equal ability. Seventy-one children from one triad were involved in the experimental group and seventy-one children from the other triad were involved in the control group.

Children in the experimental group were divided into one of the nine subgroups mentioned above. Since a certain basic level of reading and writing skills were deemed necessary in order to complete the creative writing assignments and the Verbal Form of the Torrance Tests of Creative Thinking, children whom the teachers felt functioned well below a fourth grade level were eliminated. In order to insure an even distribution of each grade level in each group, a random sample of three from one grade level, three from another grade level, and two from the third grade level were assigned to each group.

Instruments Used

The instruments used in the assessment of creative ability in this study were the Torrance Tests of Creative Thinking. To assess the verbal creativity of the students, Verbal Form A was used; to assess the nonverbal creativity of the students, Figural Form B was used.

The test-retest reliability for this instrument is stated by Torrance (1966, p. 21) to range from .50 to .93. Construct validity scores are given between this test and the Frenkel-Brunswik Revised California Inventory in which a correlation of -.37, -.40, and -.32 was found. When fifth and sixth graders test scores were correlated with scores derived from evaluations of the students' imaginative stories, coefficients of .49 and .51 respectively were obtained. The correlation coefficients derived from this test and the Otis Quick-Scoring Test of Mental Ability were found to range from .42 to .86 (1966, pp. 26-54).

Information on the predictive validity of this test is limited. The only study reported between this test and criterion measures derived from a checklist over a seven year period gives a range of correlation coefficients of .16 to .27.

The reliability of scoring by regular classroom teachers were found to be high (Torrance, 1966, p. 19) and therefore acceptable by the author of the tests, therefore, scoring was completed by the author.

It is recommended in the manual for the Torrance Tests of Creative Thinking that the tabulation of scores for the Fluency, Flexibility, and Originality subtests of the Verbal Test, and the Fluency, Flexibility, Originality and Elaboration Subtests for the Figural Test be treated separately and not be cumulated into one total score (1966, p. 72). Thus, in computing the mean differences between the control and experimental groups, each subtest score was used separately.

There are seven subtests for Verbal Form A of which the first four were administered and scored for Fluency, Flexibility and Originality. The first of these is called Ask Activity designed to assess the individual's ability to ask questions whose answers would complete gaps in the individual's information. The second and third activities of this form titled Guess Causes and Guess Consequences, respectively, were designed to learn how well an individual is able to develop cause and effect hypotheses. Activity four, Product Improvement, assesses the individual's ability to increase the attractiveness of a toy.

There are three activities in the Figural Form B of which the first two were administered and scored for Fluency, Flexibility, Originality and Elaboration. The initial activity of this form is titled Picture Construction. The activity consists of an orange jelly bean shape with adhesive backing which is used to construct a picture.

Elaboration is encouraged in the instructions, and scores are recorded for Fluency, Flexibility, and Originality as well as Elaboration. The second activity is titled Incomplete Figures. Ten incomplete drawings make up this activity which is scored for Fluency, Flexibility, Originality, and Elaboration.

The tests were administered to the students in both the experimental and control groups by the author in groups of approximately twenty-four.

Chapter 4

RESULTS

Testing of Hypotheses-- Report of Findings

Main effects. A t-test was run on the experimental and control groups for the seven subtests of the Torrance Tests of Creative Thinking. The results are reported below.

Verbal fluency. The mean score of the control group was 35.68; the mean score of the experimental group was 46.14. The difference is significant at the .05 level.

Verbal flexibility. The mean score of the control group was 19.97; the mean score of the experimental group was 23.14. The difference is significant at the .05 level.

Verbal originality. The mean score of the control group was 43.13; the mean score of the experimental group was 60.55. The difference is significant at the .05 level.

Figural fluency. The mean score of the experimental group was 8.42; the mean score of the control group was 8.48. The difference is not significant at the .05 level.

Figural flexibility. The mean score of the experimental group was 7.08; the mean score of the control group

was 8.45. The difference is not significant at the .05 level.

Figural originality. The mean score of the experimental group was 12.58; the mean score of the control group was 13.35. The difference is not significant at the .05 level.

Figural elaboration. The mean score of the experimental group was 36.31; the mean score of the control group was 37.08. The difference is not significant at the .05 level.

Table 1 summarizes the results of the t-test between the experimental and control groups.

Table 1
T-TEST BETWEEN THE EXPERIMENTAL
AND CONTROL GROUPS

	Sub-test	Mean Score of Experimental	Mean Score of Control	Difference	Signifi-cant*
Verbal	1	46.14	35.68	10.46	*
	2	23.14	19.97	3.17	*
	3	60.55	43.13	17.42	*
Figural	1	8.42	8.48	-.06	--
	2	7.08	8.45	-1.37	--
	3	12.58	13.35	-.77	--
	4	36.31	37.08	-.77	--

In summary, significant differences were found to exist between the experimental and control groups on all Verbal subtests. No significant differences were found to exist between the two groups on any of the four Figural subtests.

Time conditions. An f-test for heterogeneous variance was run on the three subgroups within the experimental group. No significant difference was found. It was assumed, therefore, that homogeneous variance existed. T-tests for the differences between groups under each time condition on each subtest were run. The results are reported below.

Fluency. The mean score of the ninety minute group was 43.21; the mean score of the sixty minute group was 46.29; the mean score of the thirty minute group was 49.04. When the difference between the means for these groups were tested, it was found that there was a significant difference between the thirty and ninety minute groups, and a significant difference between the sixty and ninety minute groups, but no significant difference between the thirty and sixty minute groups.

Flexibility. The mean score of the ninety minute group was 22.33; the mean score of the sixty minute group was 23.21; the mean score of the thirty minute group was

23.91. No significant differences were found between any of these groups.

Originality. The mean score of the ninety minute group was 53.66; the mean score of the sixty minute group was 60.38; the mean of the thirty minute group was 67.91. When the difference between the means of these groups were tested, it was found that there was a significant difference between the thirty and sixty minute groups, between the thirty and ninety minute groups, and between the sixty and ninety minute groups.

Table 2 summarizes the results of the t-tests on the subgroups of the experimental group under the three time conditions.

Table 2

T-TESTS ON THE SUBGROUPS OF THE EXPERIMENTAL GROUP UNDER THE THREE TIME CONDITIONS

Subtest	30	60	90	Significant Difference*		
	Minutes	Minutes	Minutes	1-2	1-3	2-3
Fluency	49.04	46.29	43.21	-	*	*
Flexibility	23.91	23.21	22.33	-	-	-
Originality	67.91	60.38	53.66	*	*	*

In summary, significant differences were found to exist when the ninety minute group was compared to both the sixty and thirty minute groups on the Fluency subtest. Significant difference was found on all comparisons on the Originality subtest.

No differences were found between groups on the Flexibility subtest.

Space conditions. An f-test for heterogeneous variance was run on the three subgroups within the experimental group. No significant differences were found. It was assumed, therefore, that homogeneous variance existed, and t-tests for the difference between groups under each space condition on each subtest were run. The results are reported below.

Fluency. The mean score of the self-contained group was 44.22; the mean score of the individualized group was 45.00; the mean score of the pod group was 49.13. When the difference between the means of these groups were tested, it was found that there was significant difference between the pod and individualized groups, and significant difference between the pod and self-contained groups, but no significant difference between the individualized and self-contained groups.

Flexibility. The mean score of the pod group was 22.83; the mean score of the individualized group was 23.29; the mean score of the self-contained group was 23.30. No significant difference was found between any of these means.

Originality. The mean score of the self-contained group was 55.22; the mean score of the individualized group was 60.83; the mean score of the pod group was 65.38. Significant differences were found between the self-contained and pod groups, and between the individualized and pod groups.

Table 3 summarizes the results of the t-tests on the subgroups of the experimental group under the three space conditions.

Table 3
T-TESTS ON THE SUBGROUPS OF THE
EXPERIMENTAL GROUP UNDER THE
THREE SPACE CONDITIONS

Subtest	Self-Contained	Individualized	Pod	Significant Difference*		
				1-2	1-3	2-3
Fluency	44.22	45.00	49.13	-	*	*
Flexibility	23.30	23.29	22.83	-	-	-
Originality	55.22	60.83	65.38	*	*	*

In summary, significant differences were found to exist between the pod group and each of the other two groups on the Fluency subtest. No significant difference was found to exist among any of the groups on the Flexibility subtest. Significant differences were found to exist among all the groups on the originality subtest.

Interpretation of Results

Since no significant differences between any of the groups were found on any of the subtests of the Figural Test, and the means indicated the direction of higher scores for the control group, no further computations were made on the scores from the Figural Test. It can be concluded that the creative writing treatment did not positively affect nonverbal creativity.

With regard to the different conditions of time, no significant differences were found among any of the subgroups on the Flexibility subtest. In addition, the mean scores were so close that no tendency of one group to be higher than the others could be seen. Thus, the results would indicate that none of these three time conditions affect flexibility.

Under the three time conditions, the criterion of Fluency yielded indications that the ninety minute group was the least effective. The mean score for this group was significantly lower than the sixty or thirty minute

groups. While not significantly different, the thirty minute group had a higher mean score than the sixty minute group. Indications are, therefore, that the thirty minute time condition was the most effective, and the ninety minute time condition the least effective in terms of fluency.

When the criterion was originality, the means of all three time groups were significantly different from one another. The thirty minute group was shown to be the optimal condition, and the ninety minute condition the least effective.

The results indicate then, that the most effective time condition associated with fluency and originality is thirty minutes.

With regard to the three conditions of space, no significant differences on the Flexibility subtest were found among any of the subgroups. As with the time condition, the mean scores on Flexibility were so close as to not indicate any direction toward an optimal condition. Thus, the results would indicate that none of these three space conditions affect flexibility.

Under the three space conditions, the criterion of Fluency showed that the pod group produced significantly higher scores than individualized or self-contained groups. While no significant differences were indicated between the individualized and the self-contained groups, the

individualized group mean was higher. It can be concluded, therefore, that the pod was the most effective space condition and the self-contained the least effective space condition in terms of fluency.

On the Originality criterion, significant differences were shown to exist among all groups with the pod group having the highest mean and the self-contained group having the lowest mean. The results thus indicate that the pod situation is the optimal situation and the self-contained situation least effective in terms of originality.

There is some value in examining the possible effects obtained by looking at the interaction of the two main effects. Based upon the way of the treatment was set up, it is possible to take the twenty-four subjects that made up each of the three different space conditions and subdivide them into three different subgroups of eight subjects each. Each of these three subgroups of eight received the treatment under one of the three different time conditions. It is possible to do the same for each of the sample of twenty-four that composed the time conditions by subdividing them across the three space conditions. This arrangement will result in an N of only eight per cell. Inspection of the subsequent table, however, can serve as a basis for indicating possible interaction effects and further research.

By placing the mean scores of the Fluency and

Originality subtests for both the time and space conditions in ascending order, it is possible to examine the mean scores for the two criteria together in each of the nine cells. Table 4 shows the results of the combination of Fluency and Originality scores.

Table 4

INTERACTION OF TIME AND SPACE ON
FLUENCY AND ORIGINALITY

S	Self-contained			Individualized			Pod		
	X_f	X_{f+o}	X_o	X_f	X_{f+o}	X_o	X_f	X_{f+o}	X_o
<u>T</u>									
30									
Minutes	50.57	117	66.00	48.50	117	68.50	48.25	117	69.00
60									
Minutes	48.75	108	59.00	39.38	90	50.88	50.75	122	71.25
90									
Minutes	34.13	76	42.00	47.13	110	63.13	48.38	104	55.88

T = Time

 X_f = Mean Fluency Score

S = Space

 X_{f+o} = Mean Fluency Score + Mean Originality Score X_o = Mean Originality Score

As would be expected, based on the results found in the main effects, when the groups from both conditions are placed in ascending order, the least effective of the nine cells appears in the lower left with the combination of a ninety minute group in a self-contained room. As would also be expected, when moving from the cell at the lower left to the cell at the upper right, the pairs of mean scores for the cells in general increase.

The chart also indicates that all thirty minute groups obtained relatively very high scores under all three space conditions.

When looking at space conditions, the pod appears equal to the other two conditions on the thirty minute level, very high on the sixty minute level, and midway between the low self-contained and high individualized on the ninety minute level.

It is interesting that the chart also indicates that the highest pair of mean scores is found in the cell of the sixty minute group which worked in a pod situation.

Chapter 5

SUMMARY

Limitations

The results of this study can only be seen as applicable to situations similar from which the data was gathered. Generalizations to other types of children who do not attend pod schools should not be made.

Since the experimenter was also a classroom teacher while conducting this research project, contact with the children extended beyond that which took place during the experiment. Every attempt was made, however, to prevent this outside contact from being systematic. This double role may also have caused an unequal distribution of the experimenter's time among the groups. Again, every attempt was made to prevent a systematic inequality of time distribution from taking place.

The time required for administering and scoring the Torrance Tests of Creative Thinking for such a large number made it unfeasible to use the entire form of either the Verbal or Figural Test.

Conclusion and Recommendations

The creative writing treatment given in this study generally increased verbal creativity, while it did not

increase nonverbal creativity. It would appear that, as Torrance (1966) has stated, creativity is not a single dimensional trait. The verbal treatment used here was effective for increasing verbal creativity, but a separate treatment directly applicable to nonverbal processes is probably necessary to increase nonverbal creativity.

The results of this study would indicate that both time and space conditions influence the fluency and originality aspects of creativity with time being indicated as the more potent of the two.

A time condition of thirty minutes and a space condition of a pod situation proved to be the most effective pair of conditions. One speculation about this finding is possible that the combination of these two conditions is the most familiar to the students and as a result, it was easier to concentrate their energy directly on creativity rather than having to expend energy on less familiar conditions. This indication might warrant a further study focused in the area of finding conditions which are most familiar to the children and designing a treatment based on those conditions.

The results of this study also indicate the possible need to study the time and space conditions per se of the public schools. It is possible that children are conditioned to an area and a time period to such an extent that they function much less effectively in any other situation.

Another recommendation comes from the fact that the ninety minute group received twice as much creative writing time as the sixty minute group, and the sixty minute group received twice as much time as the thirty minute group, yet the thirty minute group had better overall mean scores. This would seem to indicate a need for researchers and administrators to learn whether or not a thirty minute time period is more effective than any other at the elementary level.

A final recommendation is that a shortened form of a creativity test be developed. The length and complexity of the instruments used in this study make the employment of such tests by teachers virtually impossible. If teachers are to take an active role in developing creativity, it is essential that they be provided with a test which can be administered and scored within a reasonable length of time.

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