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Evaluating the effect of a guided fantasy visualization on the figural and verbal originality of upper elementary students

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EVALUATING THE EFFECT OF A GUIDED FANTASY VISUALIZATION ON THE FIGURAL AND VERBAL ORIGINALITY OF UPPER ELEMENTARY STUDENTS

An Abstract of a Thesis

Submitted

In Partial Fulfillment

of the Requirements for the Degree

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has been approved as meeting the thesis requirement for the Degree of Specialist in Education.

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ABSTRACT

This study investigated a method for stimulating several aspects of short-term creative thinking. It was hypothesized that the figural and verbal originality scores of students receiving a guided fantasy visualization (GFV) would be significantly different from those scores of students not receiving a GFV.

Fifty-six children from the fourth, fifth, and sixth grades of Price Laboratory School, Cedar Falls, Iowa, were pre-tested on one figural and one verbal subtest from the Torrance Tests of Creative Thinking (TTCT). After scoring the subtest on the originality scale only, students were randomly assigned to experimental and control groups. Following a four week interval, experimental group students at each grade level were given a 15-minute GFV in which they listened to instructions to visualize fanciful objects and situations. Immediately following the GFV, students were administered two alternate form TTCT figural and verbal subtests. Students in the control group were given a paper-and-pencil word puzzle and a maze to work on for 15 minutes prior to TTCT post-testing. All students completed treatment and post-testing procedures outside the classrooms with their teachers not present.

Results indicated that students receiving the GFV did not achieve significantly higher mean figural and/or verbal originality scores than students who did not have the GFV. Data analyzed by grade level indicated that the fourth grade GFV students were significantly higher in figural originality than the fourth grade control students and that

students in the sixth grade control group had higher mean verbal originality scores than sixth grade GFV students. No differences in mean originality scores by sex were found.

Results of the present study and two similar investigations suggest the possibility that upper elementary students need considerably more experience with the GFV than college students for the GFV to have a significant effect on short-term creative thinking. Additionally, the results indicate that the contents of a GFV may need to include a substantial amount of relaxation instruction before a GFV can produce a change in creative thinking. Finally, based on the findings of the present study, recommendations for future research were suggested.

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Chapter 1

INTRODUCTION

Interest in stimulating creative thinking in the public schools has traditionally been sporadic. Creativity has been a popular educational catchword but sustained and widespread effort to enhance creative thinking has been lacking (Parnes, 1966). Reasons for this inconsistent effort are varied and complex. It would appear, however, that any difficulty and expense in implementing creative stimulation programs would lessen interest in such programs. Currently, tight educational budgets and the call to emphasize the acquisition of "basic" academic skills have contributed to a perception that creative thinking is a benign but expendable "extra." If creative thinking is to advance as an educational goal, it may be that an enlarged repertoire of creative thinking stimulation techniques are needed. The stimulation techniques need to be economical, brief, effective, and simple to integrate into the ongoing curriculum.

Psychoanalytic and Association Theories of Creativity

Methods for stimulating creative thinking have grown out of modifications of existing techniques as well as arising from attempts to put certain theoretical explanations of creative thinking into practice. One theory of creativity developed from the psychoanalytic model views creative thinking as the result of sublimating basic drives. Sublimation is seen as the basic process by which libidinal energy is transformed into socially acceptable forms. According to Bloomberg's (1973) summary

of Freud's views, the creative person partially abandons reality for fantasy in order to provide an outlet for unconscious energies. Freud also linked creativity and imagery and proposed that artistic creativity was a restructuring of archaic unconscious images after these images had been accepted as conscious symbols. The creative process was seen as generating from within rather than outside the person and the creation mirrored unconscious imagery after it had been processed through the ego.

Jung (1971) likewise saw a link between unconscious images and creativity. He stated, "The unsatisfied yearnings of the artist reach back to the primordial images in the unconscious which is best fitted to compensate the inadequacy and one-sidedness of the present" (p. 32).

Another psychoanalytic theorist, Kubie (1958), differed from Jung and Freud when he hypothesized that both the unconscious and conscious were too rigid to allow the playful connecting and reconnecting of ideas involved in the creative process. A middle level, the preconscious, was the real source of creativity, and imagery was seen as the conscious product of sampling from the preconscious.

Kubie's concept of the preconscious as the source of creativity is similar to that state that Rugg (1963) labels the "transliminal mind." The transliminal mind is a threshold state that marks off the conscious from the non-conscious. It is a relaxed, receptive state "that is 'off-conscious' not unconscious for the organism is awake and in control" (p. 39). In this light trance state, which is also experienced in the drowsy state just before and after sleep, images act as the "liaison between conscious percept and unconsciously projected symbols in the act of response" (p. 69).

A different theory of creativity has been labeled the "association theory" (Bloomberg, 1973). This theoretical approach proposes that the ability to think creatively is a matter of utilizing a variety of associations accessible to an individual. Ribot (1906) saw the creative process as a complementary process of association and disassociation which occurred by spontaneously causing images to associate into groups through imagination. Mednick (1962) theorized that creative thinking is a "process involving the forming of associative elements into new combinations which either meet specified requirements or are in some way useful. The more mutually remote the elements of the new combination, the more creative the process or solution" (p. 161). According to Mednick, creative thinking has as its source "any ability or tendency which serves to bring otherwise mutually remote ideas into contiguity" (p. 163).

Aspects of Creativity Theories Relevant to the Present Investigation

Hallman (1967) has a model of creativity that describes several necessary criteria for creative thinking. Certain aspects of psychoanalytic and association theories of creativity exemplify these criteria. One of the necessary criteria for creativity Hallman discussed is that of "nonrationality." Nonrationality describes the preconscious process which produces new connections. As Hallman explained the process,

> I refer to it as nonrational because the combinatorial activity occurs in the form of unconscious operations; it does not belong to the rational mind, nor is it consciously controlled. Rationality divides and distinguishes; it focuses

> upon differences. Metaphoric activity unites and relates; it flourishes upon similarities and transpires among the primary processes. (p. 23).

Psychoanalytic theory in particular focuses on the role of the non-rational via the unconscious, preconscious, and imagery.

Another criterion for creative thinking is that of "connectedness," the bringing together of already existing elements into a distinctive relationship (Hallman, 1967). It is the capacity to regard life metaphorically, to experience even orderliness as malleable. Additionally, creativity is "both a combination of elements into new relations and recombining them. This means that creativity is not merely the capacity to connect elements in a new way, but to transplant these new combinations onto previously unrelated materials" (p. 20). The association theory of creativity as propounded by Mednick (1962) would appear to reflect strongly the criterion of connectedness.

One other factor needs to be considered. Neither psychoanalytic nor association theory appears to admit to the influence of external environmental factors in enhancing creative thinking. Creative thinking, according to the psychoanalyists, is internally generated by the unconscious or preconscious, and the associationists seem to regard creative thinking as a fixed ability or tendency.

There is an approach to creativity which has been labeled "environmental" (Bloomberg, 1973). The basic assumption of the environmental approach is that creative thinking is normally distributed in the population and that stimulation of creative thinking through the intentional control of short and long term environmental variables can be

achieved. When this assumption overlays the nonrational-imagery and connectedness aspects of the other previously mentioned theories, then a potentially useful model for stimulating creativity can be developed.

The Present Theoretical Model of Creativity Stimulation

The model of creativity stimulation proposed by the author is illustrated in Figure 1.

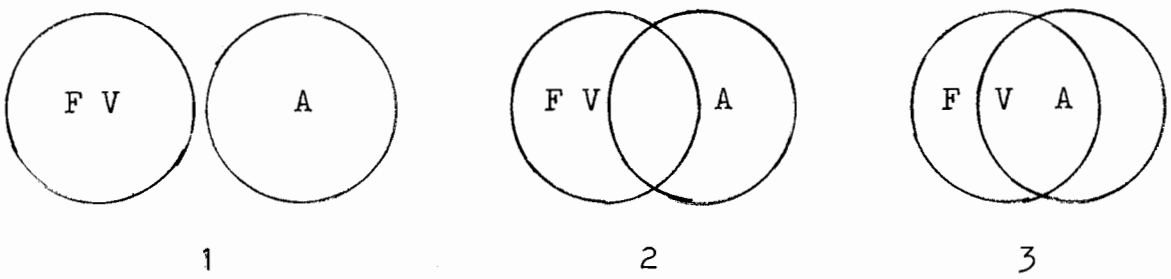

Figure 1. A model of creativity stimulation utilizing a guided fantasy visualization.

In Figure 1, diagram 1, in which no fantasy visualization is implanted into awareness, solutions to creative problems will tend to be mundane and tied to strict reality censorship. However, as fantasy (FV) is introduced into awareness (A) through external stimulation, it becomes more likely that past memories will be both combined in non-ordinary ways and accessed into awareness (A). The diagrams numbered 2 and 3 visually represent this increasing likelihood, with the magnitude of the likelihood being represented by the overlap between (FV) and (A).

Guided fantasy visualization introduces remotely associated ideas into awareness and acts as a triggering and releasing mechanism in which

past memories are stimulated to join in unusual ways in the preconscious, followed by release, in the form of imagery, into awareness. These incoming non-ordinary combinations can be scanned by conscious controls to determine the relevancy to problem solutions. Thus, the net result is that statistically infrequent but relevant responses will be increasingly evidenced in the short term as the person attempts to solve certain creative problems.

Creativity Stimulation

The possibility that the creative thinking of children can be affected by the long term, indirect aspects of the school environment has been the subject of investigation. In affecting the creative thinking of elementary students, the creative ability of classroom teachers has been found to be less significant than the teacher's attitude and motivation regarding creativity (Torrance, 1965, 1972a).

Results of studies that compare the effects of open and traditional classrooms on creative thinking are mixed. Forman and McKinny (1978) reported no difference in creative thinking between the students of open and traditional classrooms. Ramey & Piper (1974) found that open class students were higher in figural creativity and traditional class students were higher in verbal creativity.

Somewhat more conclusive are the studies researching the manipulation of environmental conditions immediately prior to a creative thinking activity which indicate that children's performance on these tasks can be significantly altered (Torrance, 1972a). Prior classroom context (Elkind et al., 1970), promise of reward (Torrance, 1965),

test-like versus game-like instructions (Kogan & Morgan, 1969), and play warm-up (Nash, 1975) have been variables studied in the context of pre-creative activities.

The effect of direct practice and instructions immediately prior to creative problems (free association) was researched in a series of studies by Maltzman and his associates (1958a, 1958b, 1960). Results indicated that a) frequency of original responses was increased, b) the increase in originality transfered to similar problems, and c) higher levels of originality were maintained over several months.

A number of extended instructional programs and approaches designed to stimulate creative thinking have been developed for use in industry and later adapted for use in the public schools (Davis & Houtman, 1968; Covington, Crutchfield, & Olton, 1974; Myer & Torrance, 1965; Gordon, 1961). Most of the studies that have evaluated extended creativity programs in college or elementary school classrooms seem to support the view that creativity can be trained (Covington & Crutchfield, 1965; Reese & Parnes, 1970; Khatena & Dickerson, 1973). However, Mansfield et al. (1978) recommend caution regarding the result of these and other similar studies because of the lack of demonstrated transfer of skills to dissimilar problems and the lack of evidence that the programs influence creativity outside the school setting.

Extended creativity stimulation programs attempt to externalize nonrational and combinatorial processes. However, another approach, the alteration of states of consciousness, intends to create a favorable environment within the person for creative thinking (Green & Green, 1977).

Research into altered states of consciousness involving hypnosis (Gur & Reyher, 1976), meditation (Travis, 1979), mind-expanding drugs (Harman et al., 1966), and biofeedback (Green & Green, 1977) have indicated varying degrees of positive effects on aspects of creative functioning.

Imagery, Fantasy, and Creativity

Imagery awareness during various stages of the creative process has been reported by many individuals generally acknowledged for their creativity. These reports have been an important impetus for investigating the connection between imagery and creativity (Durio, 1975). One of the most frequently cited examples is Albert Einstein's description of his creative thinking: "The psychical entities which seem to serve as elements in thought are certain signs and more or less clear images which can be voluntarily reproduced and combined" (Ghiselin, 1952, p. 32).

Although the occurrence of imagery in the creative process of recognized creative persons has been widely reported, little empirical evidence exists that demonstrates the relationship between imagery variables and creative thinking. Schmiedler (1965) reported a low positive correlation between self-reports of vividness of visual imagery and the creative interests of college students. Another variable, autonomy of imagery, was shown to correlate with creative self-perception (Khatena, 1975b).

Theoretical propositions regarding the relationship between visual imagery and creativity are more frequent than empirical studies of that relationship. Gordon (1972), in describing the link between creative thought and imagery, referred to images as "the raw material of the

imagination" (p. 79). Gowan (1979) added the role of brain hemispheric specialization to the imagery-creativity connection:

> Mastery of a particular discipline is a necessary but not a sufficient condition for creative production. The sufficient condition is incubation and the production of imagery, or at least the ability to allay left hemisphere function enough to pay some conscious attention to it. (p. 40)

One type of visual imagery associated with creativity is "imagination imagery" (Samuels & Samuels, 1975). Imagination images may contain elements of past experiences but these elements are often arranged in unique and fanciful ways. The process of experiencing or creating imagination images has been referred to as fantasy. Fantasy has been studied in children through observation of make-believe play activities and by measurement of fantasy predisposition (Singer, 1973). Links between fantasy and creative thinking have been reported with indications that fantasy predisposition is positively correlated with creative story writing (Singer, 1973). Similarly, creative high school students and college women reported a higher frequency of childhood imaginary playmates and daydreams than their less creative peers (Schaefer, 1969; Helson, 1965).

Fantasies (imaginary visual imagery) can occur spontaneously or they may be verbally directed and guided by a person other than the one actually experiencing the fantasy. Guided fantasy visualization as a technique has been utilized extensively both in psychotherapy and in counseling and has been reported to be effective in resolving phobias,

depression, and interpersonal problems (Kelly, 1972; Singer, 1974; Klimek & Canfield, 1979).

Although guided fantasy visualization (GFV) has been used in both psychotherapy and counseling, the effect of GFV on creative thinking has been studied infrequently. Guided fantasy visualization has been found to have significant positive effects on the verbal creative thinking of college students (Bagley, 1977) and of gifted elementary students (Hershey & Kearns, 1979). Similarly, the fluency and originality of solutions to verbal, creative, problems was significantly improved when college students were requested to imagine themselves to be in different physical settings (Davis & Manske, 1970). These GFV studies suggested that guided fantasy visualization stimulates creative thinking, but further research is needed to verify and extend this implication.

Statement of the Problem

While anecdotal reports and theoretical statements have alluded to the importance of visual imagery in the creative process, the question of whether or not visual imagery can be used to facilitate creative thinking needs continued research. The guided fantasy visualization technique may represent a practical and efficient method for stimulating some aspects of short-term creative thinking. The present study examined the effect of a guided fantasy visualization on the figural and verbal originality scores of upper elementary school children.

Null Hypotheses

1. The figural originality scores of upper elementary students who experience a guided fantasy visualization will not be significantly

different than scores of students who did not have a guided fantasy visualization.

2. The verbal originality scores of upper elementary students who experience a guided fantasy visualization will not be significantly different than scores of students who did not have a guided fantasy visualization.

Importance of the Study

As a creativity stimulation technique, guided fantasy visualization may be particularly useable because of its simple format and its adaptability to different school subjects. Thus, guided fantasy visualization may help promote the integration of creative thinking throughout the school curriculum. The study will also add to the empirical literature on the effectiveness of such training.

Limitations of the Study

Generalizability of the findings of the study is limited because of the narrow range of representation of socioeconomic, geographic, and racial groups in the present study. Additionally, the high level of academic achievement obtained by the sample restricts generalizability.

There are still some questions to be resolved regarding the long-term predictive validity of the test instrument used in this study. Therefore, any score on the TTCT may reflect an ability to think creatively in a test setting rather than the likelihood of later scientific or artistic creative achievement.

Definitions of Terms

Creative Thinking

A process resulting in a product or idea that is novel and appropriate for the particular context (MacKinnon, 1975). Creative thinking is used synonymously with "creativity" and "creative problem-solving."

Originality

The degree of novelty or uniqueness that a creative product or idea is judged to possess and still be appropriate for the particular problem context. Operationally, originality is the scale on the Torrance Test of Creative Thinking (TTCT) that is determined by the statistical infrequency the product possessed in the norming sample (Torrance, 1974). Figural originality applies to situations in which problem characteristics and resulting solutions are primarily visual and non-verbal. Verbal originality applies to problem characteristics and resulting solutions that are primarily in written verbal form.

Guided Fantasy Visualization (GFV)

Verbal instructions given to generate visual images of objects and ideas that may not be associated in ordinary reality.

Visual Imagery

Internal figural representations which are related to sensory experiences (Durio, 1975). Visual imagery is used synonymously with "visualization."

Fantasy

The process of creating or experiencing imagination images.

Chapter 2

REVIEW OF LITERATURE

Introduction

In this chapter a number of variables that appear to influence or relate to creative thinking are reviewed. These variables include long-term school environment, short-term pre-creative activity stimulation techniques, organized extended creativity training programs, and altered states of consciousness. In most cases the intent of the research is to determine methods for enhancing creative thinking.

Following the review of creativity variables, the focus is directed toward the role that visual imagery and fantasy play in the creative process. The use of guided fantasy visualization in psychotherapy and counseling is reviewed. Finally, studies that explore the possibility of enhancing creativity through guided fantasy visualization are analyzed.

Creativity Stimulation Research

School Environment and Creativity

The impact of long-term school environmental variables, such as school "atmosphere" and teacher characteristics, on the creative thinking of children has been the subject of investigation. Can a school-wide climate of informality and openness positively affect creative thinking? Haddon and Lytton (1968) studied 211 British primary school students between ages eleven and twelve matched for SES and verbal reasoning who were attending one of four "formal" or "informal" schools. They found significant mean differences in favor of the informal school

students for verbal, non-verbal, and composite creative thinking scores as measured by the TTCT. School approach (formal or informal) was determined on the basis of reports from local school inspectors. These reports were supported by the observations of the researchers. Informal schools displayed more freedom of movement and collaboration between teachers and students, whereas formal schools operated on a more confined teacher expository approach. In a follow-up study four years later (Haddon & Lytton, 1971), the former informal school students were again found to be superior on the Torrance subtests. No attempt was made to determine if the secondary schools currently attended were formal or informal. The long-term positive effects of the informal schools regarding creative thinking were attributed to the high degree of student self-initiative that was emphasized.

When students from two private American elementary schools, one "open" and one "traditional" were compared using the TTCT, there was a school-creative dimension interaction (Ramey & Piper, 1974). Open school students scored higher in figural creativity while traditional students were superior in verbal creativity. The authors point out that since there was no random assignment to open or traditional schools, socioeconomic factors or home influences could have determined the differences in group creativity means.

Forman and McKinney (1978) studied the influence of open and traditional second grade classrooms on creative thinking. The Walberg-Thomas Open Education Scale was used to determine if a particular classroom was open or traditional. No significant differences on a test of composite divergent thinking by Wallach and Kogan were found. In reading and math achievement, however, traditional class students were superior.

The attitude and behavior of teachers regarding the degree of control they exercise over their students may have some influence over their students' creative thinking. When scores on the TTCT of elementary students attending the classes of either high or low controlling teachers were compared, the results were mixed by type of creativity (Wodtke, 1963). Students of low controlling teachers made greater gains in composite verbal creativity at the fourth grade, whereas students of high controlling teachers made greater gains in figural elaboration at the fifth grade level. In a later study by Wodtke (1965) gain scores were not used. Rather, the students of high and low controlling teachers were administered the TTCT and then classified as high or low creatives. These students were then observed during six different fifteen-minute sessions. It was found that student classroom behavior on such dimensions as Nonconformity and Self-Initiated Student Talk did not correlate with scores on the TTCT. There was no evidence for the hypothesis that high controlling as opposed to low controlling teachers had a differential effect on the classroom behavior of high and low creative pupils, at least in the short run.

The classroom environmental variables of teacher-imposed control and structure on second grade class discussions and subsequent effects on creative play were investigated by Crabtree (1967). Results indicated that students were significantly more original and flexible in their dramatic play following class discussion in which topics to be discussed were jointly determined by students and teachers. When topics for discussion were predetermined by the teacher, students' play was more realistic and convergent. Results in this study may have been less

ambiguous than previously mentioned classroom environmental studies because the six class discussions under each control format were immediately followed by a 25-minute period of observed and measured play. Thus the link between treatment and effect was much closer temporally than other studies of long-term variables.

The attitudes and motivations of teachers toward creativity appears to be more influential on students' creative thinking than the teachers' creative ability. Fifth grade students of teachers identified as highly creative made no greater gains on the TTCT than students of low creative ability teachers (Broome, 1967). Similarly, high creative teachers were no better at judging pupil creativity than low creative teachers (Baker, 1973). However, Torrance (1965) found that a significantly greater proportion of the kindergarten students made gains on total TTCT scores when taught by teachers who were highly motivated to foster creativity than when instructed by teachers not similarly motivated. Students of high creative motivation teachers also made significantly greater gains in creative writing than did students of teachers with low creative motivation.

The effects of teachers' attitude toward creativity on seventh grade males and females was studied by James (1963). Male students of high creative motivation teachers scored significantly higher on the Minnesota Test of Creative Thinking in total creativity than did students of low creative motivation teachers. Female students of high creative motivation teachers were higher in fluency, elaboration, and non-verbal creative thinking.

Torrance (1962, 1964) has investigated other variables in the classroom environment that potentially influence students' creative thinking. Peer attitudes toward highly creative students appear to be negative. Peer disapproval of high creatives within groups of five elementary students engaged in creative problem solving took the form of openly expressed hostility, criticism, ridicule, and shunning. This study did not indicate, however, whether these peer responses tended to reduce the productivity of the highly creative students.

Torrance (1968) reports that creative thinking test scores from American fourth grade students generally decline from the scores obtained by the same students in the third grade. Torrance accounted for this result by referring to a number of inhibiting aspects typical of the classroom environment, and particularly emphasized in the transition between third and fourth grade. These creativity inhibiting factors are peer pressure to conform, orientation toward correct answers, disapproval toward questioning and exploration, emphasis on speed, and divergency equated with abnormality.

Does competition, which can be characteristic of the classroom environment, affect creative thinking? Torrance (1961) studied children in grades one through six and found that competition produced greater fluency, flexibility, and originality in creative thinking tasks at each grade level. However, when the scores of students under competitive conditions were compared to those of students who did not compete but instead had a creative warm-up activity prior to testing, it was found that the competitive condition subjects were superior at three of the six grade

levels (Torrance, 1965). Torrance concluded that the advantage of competition over non-competition was reduced but not eliminated when the non-competitors had a creative warm-up activity.

Summary

In summary, the results regarding the influence of school and teacher orientation (open or traditional) on students' creative thinking are not conclusive. Less tentative are the results of studies that indicate that teachers' motivation to encourage students' creative thinking can have a significant effect on that creative thinking but that teachers' creative ability does not appear to have such an effect. The role of peer pressure in influencing students' creative thinking remains speculative, but another classroom variable, competition, does seem to enhance aspects of psychometrically measured creativity.

Short-Term Pre-Creative Activity Stimulation Techniques

The manipulation of short-range environmental variables immediately prior to a creative activity appears to have direct and positive effects on performance during the creative activity. Elkind et al. (1970) studied the influence of classroom activities and students' attitude toward these activities on subsequent performance on tests of creative thinking. Thirty-two children with ages ranging between five and twelve were tested on alternate forms of the Wallach-Kogan Creativity Test following participation in either of two motivating conditions. One condition involved participation in individual activities that each child had determined to be interesting and the other condition involved doing an "uninteresting" activity, such as searching for letters and numbers.

Each child was told that he would return to finish that particular class activity following the creativity testing. Results indicated that the children, regardless of age, performed significantly higher on the creative thinking tests when they left an uninteresting activity. Elkind speculated that children's motivation to do well on the creativity test was influenced by the prior classroom context and expectation about returning to that context.

Scores on subsequent creative thinking tests improved significantly when elementary students were offered either ten minutes extra recess or money (Glover & Gary, 1976; Torrance, 1965) and when college students were offered extra points on a class test (Halpin & Halpin, 1973). However, Torrance (1972) cautions that extrinsic rewards "have to be reapplied each time the desired performance is required and cannot be counted upon for continued creative thinking" (p. 129).

Motivation for a subsequent creative exercise can be improved through so-called "warm-up" activities. Besides motivation, these activities may help induce a readiness or set for the impending creative exercise. Nash (1975) examined the effects of three different warm-up activities on the verbal creativity of 105 primary age disadvantaged children. The experimental groups received twenty minute warm-up activities consisting of either free play, listening to humorous and dramatic stories, or creative dramatics. A control group received no warm-up. Small groups of six children were then scored as an individual on the Product Improvement subtest of the TTCT. Results indicated that only the listening and creative dramatics groups were significantly higher than the control group. Nash concluded that free play does not necessarily immediately

stimulate creative thinking and that the listening and creative dramatics warm-up activities encouraged a behavioral set for continued production of imaginative responses.

Disadvantaged primary students were the subjects for a comparison of the effects of two different warm-up activities on the TTCT Verbal Form B (Aliotti, 1969). Two groups of children received a 40-minute warm-up session which stressed creative dramatics, make-believe play, and interpretive dance. On the following morning the first group was administered the TTCT while the second group had a warm-up consisting of verbal expression and original association to concrete stimuli. The second group and the control group, which had received no warm-up, were tested on the third day. No significant differences were found between any of the three groups. However, the creativity testing did not immediately follow the warm-up activities. Thus the potency of these activities for creative set induction could have dissipated from one day to the next.

Figural, rather than verbal, creative thinking was the dependent variable in another investigation of the impact of warm-up activities (White, 1976). One hundred sixty fourth graders were randomly assigned to a control group for one of three 5-minute warm-up activities: movement to music, drawing in response to verbal stimulation, and brainstorming. All activities focused on response to and manipulation of a geometric form, the square. Immediately following the warm-up activities the subjects were administered the Circles subtest of the TTCT. Although none of the three experimental groups differed among themselves, they all had significantly higher scores on the figural creative thinking test

than the control group. Enhancement of creative thinking scores was attributed to the common context of geometric form in warm-up and testing situations as well as the divergent set induction produced by the warm-up activities.

Listening to a dramatized tape recording of a fantasy space journey and then drawing a picture of the newly discovered planet was the pre-creative warm-up activity in a study by Carrol (1980). Second and sixth graders, but not fourth graders, in the experimental groups showed a significant superiority in figural creativity over a control group, which did not have a warm-up activity.

A wide range of warm-up activities appears to stimulate creative thinking when these activities both involve aspects of creative thinking and are followed immediately by the primary creative activity. Content of instructions also appears to affect performance on creative activities, i.e., creative thinking tests. Gilchrist and Taft (1972) found that architectural students had significantly more original responses on the Guilford Unusual Uses Test administered immediately following the instructions which emphasized unexpected and imaginative ideas. This instruction effect did not interact with the students' previously measured creativity or achievement skill level.

Trentham (1973) found that giving examples of original responses along with regular test instructions for the TTCT did not significantly boost scores as compared to receiving regular instructions alone. These findings, however, do not seem to contradict the Gilchrist and Taft study (1972) since the regular TTCT instructions already contain exhortations to produce original ideas. Originality-invoking test

instructions were superior in enhancing creativity scores to instructions which fostered a game-like attitude (Kogan & Morgan, 1969; Belcher, 1975).

Maltzman and his associates (1958a, 1960) not only examined the effects of instructions on creative performance but also studied the effects of direct training carried out immediately prior to creative problem solving. In one study (Maltzman et al., 1958a), the training of the experimental groups consisted of making five different free association responses to a word list prior to responding to another word list and taking the Guilford Unusual Uses Test. A control group was allowed only one response to each word on the training list. One of the two experimental groups received intermittent praise for original response and all three groups were subdivided by either receiving originality-oriented instructions or not. Results indicated that both training and instructions produced a significant increase in originality on the free association test list. Additionally, the experimental subgroups receiving training as well as originality instructions were significantly more original than the control group receiving instructions alone. These results indicated that the training might have produced effects independent of instructions to be original. Transfer of training to the Unusual Uses Test was not clearly indicated but did occur in a subsequent series of experiments (Maltzman et al., 1960). Maltzman summarized his series of experiments stating:

> In all of the experiments, successive training trials in the standard experimental condition (evoking multiple free

> association responses to the same word stimuli) are accompanied by increases in the uncommonness of responses. The originality induced in this manner transfers to different stimulus materials and these effects tend to persist. (p. 239).

The effects of modeling creative responses on subsequent creative problem-solving performance is another short-term environmental variable that has been investigated. Mueller (1978) found that presenting models of figural creative solutions could either enhance or inhibit figural creative thinking depending on whether the model responses were high or low in creativity. However, verbal creativity was not affected by modeling. Modeling was a primary short-term training procedure in an intriguing experiment by Meichenbaum (1975). Undergraduate subjects observed models of creativity-enhancing self-statements: e.g., "Release controls; let your mind wander. Just be free wheeling. You have to put the elements together differently." This was followed by rehearsal to make the self-statements quieter and more internalized. When compared with two control groups, the experimental group manifested a significant increase in originality on two tests of creative thinking.

Summary

Creative thinking, occurring in a classroom or a laboratory, seems to be responsive to events that immediately precede it. Short-term manipulation of environmental variables, whether set-inducing warm-up activities, instructions, or training, appear in the majority of cases to alter creative thinking, at least in the short run.

Synectics

There exist a number of organized, systematic approaches to improving creative problem solving. Among these are brainstorming (Osborn, 1963), morphological analysis (Zwicky, 1969), attribute listing (Crawford, 1954), checklists and forced relationships (Whiting, 1958), and several extended instructional programs designed for use in schools which utilize a number of previously mentioned techniques (Myer & Torrance, 1965; Davis & Houtman, 1972; Covington, Crutchfield & Olton, 1974). Synectics (Gordon, 1961) is another extended approach that, because of its systematic attempts to stimulate fantasy and imagination in the creative problem-solving process, will be described in greater detail.

The word "synectics" is of Greek origin and means the bringing together of dissimilar elements. The synectic system is a group approach to creative problem solving that attempts to systematically pull pre-conscious thinking into awareness through the use of analogies and metaphors. The key to the synectic approach is the process of "making the familiar strange" (Gordon, 1961). Gordon states:

> To make the familiar strange is to distort, invert, or transpose the everyday ways of looking and responding which render the world a secure and familiar place. The pursuit of strangeness is not a blasé search for the bizarre and out of the way. It is the conscious attempt to achieve a new look at the same old world, people, ideas, feelings, and things. In a familiar world objects

> are always right-side-up; the child who bends and peers at the world from between his legs is experimenting with the familiar made strange. (p. 22).

The following four mechanisms are used in the synectic method to make the familiar strange:

1. Personal Analogy - The investigating person becomes the problem, feeling and thinking as the problem might. Members of the synectic group can even assume the role of inanimate objects but empathy and emotion must be invested in the role.

2. Direct Analogy - Here facts or knowledge from one field are used in another. Biology is an area that is frequently used for direct analogies in solving problems. For example, a shipworm tunneling into wood serves as an analogy to solve problems in underwater construction.

3. Symbolic Analogy - This form of analogy "uses objective and impersonal images to describe the problem . . . . It is a compressed description of the function or elements of the problem as he views it" (Gordon, 1961, p. 25). Examples of symbolic analogy are "structured freedom" or "wax cloud" (p. 239).

4. Fantasy Analogy - Here a synectic group member might state a problem in terms of how he wishes the world would be. It is a "Let's pretend, let's imagine" approach. For example, the synectic group that was working on a vapor proof closure for space suits asked the question, "How do we in our wildest fantasies desire the closure to operate" (cited in Stein, 1974, p. 190).

Attempts have been made to utilize synectic techniques in education but empirical research of its effectiveness is scant. One of the synectic mechanisms, Personal Analogy, was combined with brainstorming and compared to a group that utilized only brainstorming (Bouchard, 1972). The experimental group of college students using Personal Analogy produced more solutions to the nine creative problems than the brainstorming only group, although only four of the nine differences were statistically significant.

Korth (1973) investigated the usefulness of the synectic approach with a college student population. Both experimental and control groups (total N=57) were pre-tested with a battery of creativity tests and personality tests. The experimental group then received 30 hours of training in synectic problem solving. After training, students were retested with the original test battery as well as several additional practical problems. The synectic group was significantly more improved on the creativity measures but not on the real-life problems or the personality measures.

The overall synectic approach was evaluated by Stein (1974) who stated:

> Awareness of the importance of nonrational processes and the attempt to engage them through the purposeful use of metaphors probably reflects the uniqueness of the synectic approach. Many individuals have theorized about the role of the preconscious and unconscious in the creative process, but no one has so systematically tried to engage these

sources of creative possibilities as have the synectic people. (p. 180).

Evaluation Studies of Creativity Training Programs

A number of extended creativity stimulation programs administered in a series of lessons have been evaluated. One of these, the Purdue Creative Thinking Program (Feldhusen, Speedie & Treffinger, 1971), is intended for fourth and fifth grade students and uses audiotapes with accompanying printed exercises. An evaluation study which compared the Purdue program with the Productive Thinking Program (Covington, et al., 1974) involved 793 pupils from thirty-six fifth grade classes in a pre-test post-test design (Treffinger, Speedie & Brunner, 1974). A number of variables were involved including teacher creativity, teacher involvement, and length of programs. Although the results were complex, the Purdue program subjects were superior to uninstructed students on only one of six scores from the TTCT. There was no significant difference in overall effectiveness between the two creativity stimulation programs.

Another creativity training program developed by Parnes (1967) used brainstorming and other techniques derived from suggestions by Osborn (1963). Reese and Parnes (1970) evaluated the Parnes program in a study involving 188 students from six high schools. Three treatment conditions were randomly assigned to two schools each. A group of "program" students studied the course entirely through workbooks, while an "instructor" group studied the same materials presented by instructors using conventional classroom techniques. A control group received no creativity instruction. All groups were pre- and post-tested on seven verbal tests of divergent thinking. Significant effects of training were

found on all seven tests and in general the "instructor" groups tended to be superior to the "program" groups.

Khatena and Dickerson (1973) have reported the evaluation of a training program that provides instruction and practice in five creative thinking strategies: breaking away from the obvious, transposition, analogy, restructuring, and synethesis. The training study involved 59 sixth graders, 31 of whom were given 360 minutes of instruction over nine days with both verbal and figural training. The verbal subtests of the TTCT were used as post-tests. Significant effects of training were found for fluency, flexibility, and originality.

Summary

It would appear that certain extended creativity training programs can enhance test-measured creative thinking. Caution regarding the efficacy of the programs may be warranted, since the evaluators of the programs tend often to be the authors of the same programs. In addition to certain methodological problems with the evaluation studies, Mansfield, et al. (1978) advise caution in assuming that the training of certain divergent thinking skills can have a positive effect on real-life creativity.

Altered States of Consciousness and Creativity

An altered state of consciousness is any shift in consciousness away from the person's ordinary baseline state. If a person's waking state is the baseline, then hypnotic trance, reveries, drug intoxication, and meditative absorption can be altered states of consciousness (Tart, 1969).

The relationship between the hypnotic state and creative thinking has been an area of interest for researchers. Positive correlations

between hypnotic susceptibility and creative thinking have been reported (Bowers & Meulen, 1970). In a study to determine the effect of actual hypnotic trance on creative thinking, Gur and Reyher (1976) divided 36 highly hypnotically susceptible males into hypnosis, hypnotic simulation, and waking groups. These subjects were given the TTCT with modified instructions requiring them to wait passively for visual images in response to test stimuli. Twelve other waking subjects received the same test under standard instructions. The hypnotized group scored significantly higher than the other three groups on figural but not verbal creativity. The authors speculated that the enhancement of figural creativity might have been the result of the combined effect of hypnosis and passive imagery on increasing right hemisphere activity.

Using hypnosis as a vehicle to implant a guilt complex, MacKinnon (1971) studied the effects of this artificially induced complex on the resulting dream content of three writers. A hypnotic suggestion was given that directed each subject to dream about the complex and then write the dream down. MacKinnon reported that only one of the subjects produced an imaginative reworking of the implanted complex, and McKinnon related this creative catharsis to the Jungian personality variable of introversion-extroversion. The capacity to draw preconscious material into awareness was suggested as a critical component.

The effect of the altered state of consciousness induced through meditation and its relationship with creative thinking was investigated by Travis (1979). Forty-six subjects prior to initiation into the transcendental meditation program were compared with forty control subjects

on TTCT figural and verbal subtests. The groups were not significantly different on the pre-test. Following five months of meditation training it was found that only the meditators made significant gains on figural originality and flexibility. Verbal creativity had not changed for either group. The superiority of the experimental group in figural creativity was attributed to the meditation-induced brain wave synchrony between hemispheres which allowed nonrational images generated in the right hemisphere to be more accessible for creative problem solving.

The one-time ingestion of two psychedelic drugs, LSD and mescaline, were reported to influence the creative thinking of 27 male professionals (Harman, et al., 1966). Significant increases occurred on three creativity tests as well as subjective ratings of creativity in solving actual work-related problems. Additionally, subjective ratings stressed the lowering of defenses, and the increase in visual imagery and fantasy during the drug-induced state. Several of the subjects reported continued positive effects of the drug experience on their work-related creativity several weeks later. The authors advised caution about the findings of this exploratory study, and in fact two of three "creativity" tests, the Embedded Figures Test and the Miller Object Visualization Test, sample primarily spatial abilities.

Ingestion of alcohol and its effect on creative thinking has not been directly studied but Stein's (1974) interpretation of a previous study by Nash (1962) indicated that small doses of alcohol did facilitate an individual's associative processes. Nash stated the following:

> While creative solutions to different problems are unlikely to be conceived and fully elaborated under the influence of large quantities of alcohol, more moderate quantities may shake one's everyday, unquestioned views. . . . Such altered ideas, even if not acted on at the time of intoxication, may provide the basis for later constructive action. (cited in Stein, p. 111).

The ability to maintain continuous self-control over an altered state of consciousness which might then prove conducive to creative thinking was the subject of a study using biofeedback techniques (Green & Green, 1977). The authors noted that visual imagery had been frequently reported in the creative thinking of acknowledged geniuses, and visual imagery had also been associated with theta and low frequency alpha waves. They hypothesized that individuals could be trained to self-induce the theta or alpha state for potential creative problem solving through the use of biofeedback. Subjects were able to increase the production of alpha waves and to a lesser extent theta waves with biofeedback. Awareness of and ability to control and report imagery also improved with practice. However, Green and Green left it to future researchers to determine if certain brain wave states accompanying imagery would then lead to actual enhancement of creativity.

Creative insights experienced during dreaming have been reported by several creative geniuses, but empirical studies of the relationship between dreaming and creativity have been few in number. The MacKinnon (1971) study dealt in part with the process by which

psychological conflicts were resolved creatively in dreams depending on an individual's personality type.

The dreams of high school male students were found to vary in the quantity of primary process thinking according to student creative ability (Domino, 1976). High creative students, based on scores from the Remote Associates Test and teacher nomination, had significantly more primary process dreams in terms of unusual combinations, symbolism, and condensation than a low creative group. Within each group, though, there was a statistically significant positive correlation between creativity test scores and quantity of primary process thinking.

Similar results were obtained by Adelson (1960) in which 42% of the dreams reported by high creative subjects were "unrealistic," i.e., logically or physically impossible, as compared to only 15% of the dreams of the low creative group. The high creative students' dreams tended to involve more transformations of the dreamer's identity; use a greater variety of scenes; and entail more humor, color, and sex than the low creative group.

Presumably, as techniques for guiding and recalling dreams improve, the opportunity to resolve creative problems during sleep may increase. LaBerge (1981), who has described a method for inducing self-awareness during dreaming, speculates, "Is it not possible that the fantastic but unreliable creativity of the dreaming state could be brought under conscious control? . . . Dreams could be the magic theater of all possibilities and a workshop of creativity and growth" (p. 56).

Summary

Various methods for temporarily altering consciousness have been studied to determine their influence on creative thinking. The underlying assumption of these studies seems to be that through altering consciousness, thought processes originating from the preconscious or the right cerebral hemisphere are allowed greater access into awareness for use in creative problem solving. Although this area of creativity research is considered exploratory, hypnotic and meditative states appear to have some influence on aspects of creative thinking.

Imagery, Fantasy, and Creativity

Reports of Visual Imagery in the Creative Thinking of Creative Geniuses

The raw material which later fueled speculation about the relationship between creativity and mental imagery came from the reports of creative geniuses who described visualizing problem solutions. For example, the Dutch chemist Kekule, who was trying to synethesize benzene, reported:

> I turned my chair to the fire and dozed. Again the atoms were gamboling before my eyes. The smaller groups kept modestly in the background. My mental eye, rendered more acute by visions of this kind, could now distinguish larger structures, of manifold conformations, long rows sometimes more closely fitted together, all twining and twisting in snake-like motion. But look! What was that? One of the snakes had seized hold of its own tail and the form whirled mockingly before my eyes. As if by a flash of lightning I awoke. (cited in Gowan, 1979, p. 45).

The result was the now famous formula for the benzene ring.

Beveridge (1957) reported that James Maxwell, who theorized the fundamental relationship between electric and magnetic fields, "developed the habit of making a mental picture of every problem" (p. 64). Poincare, a 19th century French mathematician who discovered fuchsian functions wrote:

> Every day I seated myself at my work table, stayed an hour or two, tried a great number of combinations and reached no results. One evening, contrary to my custom, I drank black coffee and could not sleep. Ideas rose in clouds; I felt them collide until pairs interlocked, so to speak, making a stable combination. (cited in Giselin, 1954, p. 26).

Finally, Max Ernst describes an experience of imagery and inspiration in an act of artistic creativity:

> One day, in 1919, being in wet weather at a seaside inn, I was struck by the way the pages of an illustrated catalogue obsessed my nervously excited gaze. It was a catalogue of objects for anthropological, microscopic, psychologicical, mineralogical, and paleontological demonstration. I found here united elements such poles apart that the very incongruousness of the assembly started off a sudden intensification of my visionary faculties and a dreamlike succession of contradictory images--double, triple, and multiple images coming one on top of the other with the persistence and rapidity peculiar to memories of love, and to the dreams that come

> between sleeping and waking. These images themselves suggested new ways for them to meet in a new unknown (the plane of unsuitability). All I had to do was to add, either by painting, or drawing, to the pages of the catalogue. And I had only to reproduce obediently what made itself visible within me, a color, a scrawl, and landscape strange to the objects gathered in it, a desert, a sky, a geological event, a floor, a single line drawn straight to represent the horizon, to get a fixed and faithful image of my hallucination; to transform what had been commonplaces of advertising into dramas revealing my most secret desires. (Ghiselin, p. 61).

The presence of visual imagery during creative thought processes has been reported by a number of persons widely recognized for their scientific and artistic creativity. Their visual imagery was frequently described as arriving spontaneously at a point in the creative process when novel solutions became apparent. These reports of visual imagery have provided much of the impetus for study into the visual imagery-creativity link.

Visual Imagery Variables and Creativity

Few empirical studies were found that directly investigated variables of mental imagery and how they relate to aspects of creative thinking. Schmeidler (1965) used two questionnaires to determine the degree of vividness of visual imagery and the quality of independence of judgment (presumed by the author to be an element of creative thinking) in 307

college students. A low positive but statistically significant correlation ($r = .21$, $p < .01$) was found for men but not for women. Women were significantly higher on a measure of vividness of imagery than men. Although the author's choice of a measure for creativity is questionable, she concluded that college students who were low in creative thinking tended to not have vivid visual images.

Khatena (1975a) also examined the imagery variable of vividness but compared it to creative self-perceptions of college students. Using questionnaires to measure the variables, Khatena found a low positive but significant correlation ($r = .20$, $p < .05$) between vividness of imagery and creative self-perceptions. Results also suggested that high vivid imagers had higher creative self-perceptions than moderate or weak imagers but the difference was not statistically significant.

In two other studies, Khatena (1975b, 1976) investigated the autonomy of imagery and its relationship to creativity. McKellar (1957) had indicated that subjects who formed autonomous, unbidden images were often surprising and highly creative. Khatena (1975b) found that persons with ability to manipulate images (low autonomy) had significantly lower creative self-perceptions than persons with low control of images (high autonomy). In the second study, Khatena (1976) compared autonomy of imagery with verbal originality and found that persons with moderate autonomy of imagery were significantly more original than persons with low autonomy. The findings of the Khatena studies regarding autonomy of imagery and creativity are viewed with caution because of the questionable assumption by Khatena that the ability to control and manipulate

visual images precluded the occurrence of spontaneous unbidden images. Presumably, a person could be high in both autonomy and control of imagery.

The degree of imagery arousal (the number of reported images) appears to correlate significantly ($r=.36$, $p < .01$) with creativity when creativity is defined as aesthetic participation (Leonard & Lindaur, 1973). Aesthetic participation was measured by a questionnaire indicating the extent of involvement in literature, art, music, and theater. Arousal of imagery was measured by a self-report rating scale scored in response to 45 sensory words. The authors indicated that the next step would be to correlate aesthetic participation and imagery arousal with some more direct measure of creative thinking.

The tendency to draw objects in unusual perspective has been reported to have some relationship with creative thinking (Torrance, 1972). To the extent that visual imagery is involved in the process of depicting objects in unusual angles and directions, the Torrance study provides an indirect link between creative thinking and imagery. A statistically significant correlation ($r=.39$, .49, .45; all significant at .001) was discovered between drawings on the TTCT Repeated Figures subtest having a visual perspective other than static, upright, and straight on and data gathered twelve years later regarding quantity of creative achievement, quality of creative achievement, and the creative aspirations of the subjects.

An investigation into the effects of sensory bombardment on the process of encoding images, i.e., drawing, was carried out by Taylor

(1970). The experimental group of 19 gifted high school students was asked to draw a picture of flowers in a vase for five minutes before and after a fifteen-minute period of sensory stimulation which involved being in a room with pungent incense, a floor vibrator, a phosphorescent Archimedes spiral wheel, and loud percussion-type music. Drawings were evaluated in terms of size, psychological openness, and aesthetic creativeness. Data analysis indicated that sensory stimulation had a significant effect on the size of drawings (the drawings were larger) and the drawings became more psychologically open as rated by three judges, and were more aesthetically creative. Although all subjects were given a pre-and post-test battery of creativity measures, no results were reported nor was any comparison with the control group reported.

Creativity and imagery were linked in an experiment in which 16 college students were subjected to two hours of sensory deprivation (Kubansky, 1961). Following sensory deprivation, subjects were interviewed about all images experienced. Results indicated a significant positive correlation between scores on creativity tests taken prior to treatment and the number of visual images experienced, as well as the clarity and complexity of these images.

Certainly more numerous than empirical studies of the relationship between creativity and imagery are openly hypothetical and speculative arguments regarding this relationship. Durio (1975) sees the theoretical position that imagery is a language system separate from symbolic coding as the best perspective for studying the imagery-creativity link. She stated:

> It has been noted that imagery allows a greater degree of individualization than does linguistic coding, which is based on symbolic categorization, the attributes of which have been more determined by consensus. An individual's image in response to a given stimulus is unique to him, while the symbolic code for that same stimulus shares semantic commonality with the coding of others. The use of imagery allows more concrete elaboration of the components of a problem than does linguistic coding alone. A visual representation may allow playful shifting of the elements in a problem situation, providing a measure of novelty in the imager's solution process that is not available to the verbalizer. (p. 240).

The proposition that images are not exact copies of reality but are personalized reformations of reality has been stated by Arieti (1976):

> No matter how extensive the discrepancy is between the original perception and the image, we must say that the discrepancy is just as important as the similarity to the original perception. If we can say that images deform or distort, we can also say that images liberate us from a punctilious reproduction of reality and introduce something new: the first elements of creativity. Imagery is thus poor history or a poor keeping of archives, but it shows the first germs of creativity. (p. 48).

Walkup (1967) goes as far as to speculate that a major difference between creative and less creative individuals is in their distinctive use of imagery.

> Creative individuals appear to have stumbled onto and then developed to a high degree of perfection an unusual ability to visualize mentally - almost hallucinate - in the areas in which they are creative. Furthermore, successful creating seems to depend on the degree to which these mental images can be manipulated and the skill with which the individual can sense the properties of these new combinations of things. (p. 285).

Summary

The few studies linking aspects of visual imagery with creativity appear to be tentative and methodologically questionable. Theoretical propositions regarding the imagery-creativity link are more numerous than empirical studies and are often based on the anecdotal reports of acknowledged creative individuals.

Fantasy Disposition and Creativity

When visual images of past events are combined in unique and fanciful ways the results may be referred to as fantasy (Samuels & Samuels, 1975). Although the link between fantasy and creativity may seem apparent, investigations of the relationship between these two variables have been infrequent (Singer, 1973).

In a study investigating correlates of high and low fantasy predisposition (Singer, 1973), 40 children ages six through nine were asked to tell stories in response to verbally administered stimuli, e.g., "a

mother and her son. They looked worried" (p. 66). The high fantasy group, determined by an interview which asked about daydreams, images, and imaginary playmates, had significantly higher ratings of creativity for their stories than did the low fantasy group. Singer cautioned against assuming that the high fantasy children would be creative in other areas and he adds, "The extent to which daydreaming frequency might be associated with general originality in nonliterary fields is an intriguing area for study" (p. 72).

Fantasy has been linked with the M response (human movement) on the Rorschach. Dudek (1968) compared the creativity of two groups of adults who differed markedly in the number of M responses they gave on the Rorschach. Measures of creativity used were the TAT, free drawings, and the Lowenfeld Mosaic Test. The high M group scored significantly higher on all creativity measures. However, generalizability of the study was limited since at least 75% of each group was in psychotherapy at the time and group mean IQ's were in the Superior range on the WAIS.

The reported occurrence of one type of childhood fantasy, creation of imaginary companions, was compared to the creativity of high school students in several different fields (Schaefer, 1969). Eight hundred high school students were categorized into four groups by sex, by level of creativity, and field of achievement (art, science, or writing). Criteria for creative achievement consisted of teacher evaluations and scores on two Guilford divergent thinking subtests. Significant differences in frequency of reports of childhood imaginary companions were obtained by high creatives in writing, but not art or science.

The relationship between reported childhood fantasy activity and creativity in female college students was investigated by Helson (1965). She found a significant positive correlation ($r=.44$, $p < .05$) between creativity as judged by college teachers and personality measures, and childhood activity involving imaginative manipulation of symbols such as painting, writing stories, and putting on shows.

Singer and Antrobus (1963) found no relationship between the frequency and content of the daydreams of college freshmen and creative thinking as measured by several Guilford subtests. However, Singer (1966) attempted to interpret the results, stating the following:

> Intuitively, despite the lack of evidence from this study, one cannot avoid the impression that persons who daydream frequently should be likely to produce a greater variety of cognitive or original material. It may be that persons with considerable ideational tendency are slower to respond and do less well on timed tests because there is more of a response to internally produced stimuli, which slows down reaction. (p. 72).

Summary

Despite a seemingly logical relationship between fantasy disposition and creativity, there have been few empirical investigations of this relationship. The results of available studies gave modest but not conclusive evidence that persons who are prone to fantasize display some tendencies toward creative thinking.

Guided Fantasy Visualization in Psychotherapy and Counseling

When fantasies occur as the result of the verbal promptings of another person, the process is referred to as guided fantasy

visualization (GFV). Guided fantasy visualization has been used as a tool of psychoanalytic therapists. The basic goal of the GFV technique is the gaining of insight into unconscious problems through symbolic imagery.

According to Singer (1974), Robert Desoilles' "guided waking dream" technique began with the therapist instructing the patient to relax and then visualize a sword, if male, or a container, if female. The therapist then asks the patient to visualize among other things, a descent into a cave in which a wizard, a witch, or a dragon are encountered. The therapist intervenes periodically as necessary to make suggestions that might impose conflicts as well as help resolve impasses.

The "guided affective imagery" method of Hanscarl Leuner is also Freudian in orientation but is more structured than Desoilles' technique (Singer, 1974). Leuner also begins with instructions in relaxation and then moves the patient through ten specific visualizations including a meadow, the ascent of a mountain, a stream, a house, a fierce beast, a sexual situation, and a swamp. Singer (1974) reported that psychothereapy patients tested before and after guided affective imagery displayed improvement on measures of rigidity, extroversion, neuroticism, and anxiety.

Guided fantasy visualization has been an important element in Joseph Wolpe's systematic desensitization technique for the treatment of phobias (Singer, 1974). The patient is asked to construct a hierarchy of anxiety-producing situations. He then is asked to relax and visualize the least anxiety producing scene in the hierarchy. If anxiety arises,

relaxation techniques are employed until the scene can be visualized with little or no anxiety. In some uses of desensitization, GFV is further utilized by substituting images of pleasant scenes for the deep muscle relaxation instruction (Lazarus & Abramovitz, 1962). The overall positive effectiveness of the desensitization approach has been reported by Bandura (1969).

Guided fantasy visualization has been successfully used to reduce the anxiety of chronically ill children (Olson, 1981). The 26 children in the experimental group ages 5 through 9 were suffering from such chronic illnesses as cystic fibrosis, hemophilia, and spina bifida. The experimental group and the 26 healthy children in the control group were each subdivided by treatment. One-half of each group had eight 15-minute sessions at home during a two-week period in which the child and his mother played fantasy games from Put Your Mother on the Ceiling (De Mille, 1967). The other half of each group and their mothers played with blocks and games of skill and chance. Results of post-testing on standard questionnaires of anxiety show that the chronically ill children who experienced GFV were significantly lower in anxiety than the chronically ill children who played other games. The healthy children who played fantasy games showed a similar but less marked pattern of anxiety reduction.

Guided fantasy visualization has been increasingly used as an adjunct to other techniques in counseling. Kelly (1972, 1974) advised counselors to use GFV in a counseling relationship to encourage relatively freely associated communication, to alleviate impasses, and

to encourage preliminary emotional expression. The approach was reported by Kelly to be especially appealing to young people, particularly because of the self-control the counselee can exercise over the situation.

The advantage of using GFV in counseling to plan positive future interpersonal contacts has been reported by Pulvina and Hossman (1976). Likewise, in career counseling, motivations, goals, and competencies have been explored through GFV that take the counselee into a future job situation (Morgan & Skovholt, 1977; Hoenninger & Skovholt, 1974).

The use of GFV as a group counseling technique in the classroom for the purpose of helping students realize inherent potentialities has been reported (Klimek & Canfield, 1979; Weinhold, 1979). These authors, as did others using GFV in counseling, stressed the importance of specific procedures. In particular the gradual introduction of the technique, explaining its function and the role of the counselee, is crucial in establishing trust and involvement. Mechanical variables such as voice quality and pacing are also considered important. In the Life Purpose Fantasy, Klimek and Canfield asked students to regress in time and visualize a "special guide" who would discuss with them their purpose in life. Following the GFV, children were asked to draw and write about their experience. The creative quality of their artistic exprssions was apparent:

> The drawings have contained many moving archetypal symbols, such as light, rainbows, the sun, contact with another being, meadow, flowers, animals, and so on. The

writing has been poetic, creative, beautifully simplistic, and yet full and rich. (p. 139).

Summary

Support for the GFV technique in counseling and psychotherapy has rested for the most part on the anecdotal reports of experienced practitioners. The GFV technique has been introduced into elementary school classrooms primarily as a method for promoting affective education, although in some cases increased creative expression has also been reported.

Guided Fantasy Visualization and Creativity

One of the outcomes of the Klimek and Canfield study (1979), cited in the previous section, was the creative expression of children following a GFV. However, there have been a few research studies which have attempted to determine the influence that GFV can have on creative thinking.

In one of the GFV investigations, Bagley (1977) devised the theoretical construct "affective gatekeeper" to describe the preconscious censor which, when relaxed, loosens primary process thinking and creative abilities which already exist. He hypothesized that a GFV which would include metaphorical statements to relax and utilize inherent creative potentials, would enhance creative thinking. Twenty-seven college students were given the TTCT Verbal Form A as a pre-test. All subjects were then ranked from the highest to lowest based on fluency scores. Three days later the subjects were alternately assigned to either control or experimental groups in order of fluency scores.

The control group went to a room and relaxed and conversed for ten minutes before taking the TTCT Verbal Form B post-test. The experimental group received the GFV prior to post-testing. Pre- and post-test gain socres indicated significantly greater gains in composite creativity as well as fluency and originality for the experimental group.

Verbal creative thinking was also the dependent variable in a study by Kearns and Hearshey (1979) which examined the responses of gifted elementary students to a series of GFV's. Subjects for the study were 51 fourth, fifth, and sixth grade students. The subjects were randomly assigned to two groups stratified by grade level. The experimental group had eight, weekly, half-hour, relaxation-guided fantasy sessions while the control group had arithmetic games during that same time period. Results indicated that the GFV group scored significantly higher than the control group in verbal fluency, originality, and flexibility.

Although limited in content, a GFV appeared to have significant effects on the verbal creative thinking of college students (Davis & Manske, 1966). The experimental group subjects were asked to visualize themselves at a picnic, a party, and in a classroom, and to list as many uses as possible for a hanger, a wire, and a screwdriver. Responses were rated for originality, usefulness, and quantity, and then compared with responses from two other groups who had received either neutral or motivational instructions. The visualizing group produced a significantly greater number of original and useful ideas than the other two groups.

Summary

Few research studies pertaining to the creativity-enhancing qualities of guided fantasy visualization have been carried out. There does appear to be reason to speculate that this technique used with upper elementary school children could have positive effects on creative thinking.

Chapter Summary

Several variables that affect creative thinking have been discussed. Short-term environmental variables, including training, instructions, and warm-up activities, appear to have a consistent and significant effect on creative thinking. The effects of long-term environmental variables on creative thinking are mixed. It appears, though, that the attitude of the teacher toward creative thinking does have a significant effect on student creative thinking. Teacher attitudinal variables appear to affect creative thinking on the part of the student, while teacher creative abilities do not.

Several structured and extended instructional approaches to creativity stimulation appear to improve students' scores on tests of creative thinking although evaluation studies of these approaches have been criticized on methodological grounds. Investigations of altered states of consciousness and subsequent effects on creativity test scores may be considered exploratory, but under certain conditions it appears that hypnotic and meditative states influence some subscales on psychometric measures of creativity.

The relationship between visual imagery and creativity was reviewed and found to rest primarily on anecdotal reports and theoretical

statements. Several empirical studies of visual imagery and fantasy and their respective relationship with creativity do report modest correlations, but emphasize future research needs rather than drawing conclusions. Guided fantasy visualization has been utilized in psychotherapy and counseling with anecdotal reports of efficacy. Those few studies that investigate the use of GFV for enhancing creative thinking indicate some effectiveness when employed on a short-term basis with a college population as well as on a longer basis with gifted upper elementary school children.

Chapter 3

METHODOLOGY OF THE STUDY

The purpose of this research was to study the effect of a guided fantasy visualization (GFV) on the verbal and figural originality scores of upper elementary school children. Subject selection and pre-treatment characteristics; instrumentation, the scoring procedure, and the inter-rater reliability; and the treatment procedures are described in this chapter.

Subjects

Initially the participants were 59 students, 38 females and 21 males, enrolled in three different classrooms in grades four through six at Malcolm Price Laboratory School, University of Northern Iowa, Cedar Falls, Iowa. Grade levels were represented as follows: 18 fourth graders, 14 fifth graders, and 27 sixth graders. There were two criteria for subject selection: enrollment in one of the three upper elementary classrooms and written parental permission. Of the original 59 subjects, 56 completed participation in all phases of the study. The two fifth grade and one sixth grade females who didn't complete the treatment phase were either absent from school on that day or didn't leave the regular classroom after being called.

The school's student population is drawn primarily from the surrounding white, middle class neighborhood. The mean composite achievement scores on the Iowa Test of Basic Skills were above the 90th percentile on national norms for each of the three upper elementary

grades. Approximately 12% of the Price Laboratory School student body consists of black children, and the percentage of black students in the sample of the present study was 11%.

Instrumentation

TTCT: Description, Reliability, and Validity

In the Torrance Tests of Creative Thinking (TTCT) there are two tests, Verbal and Figural, and two equivalent forms of each test, yielding a total of 16 subtests. In this study the Parallel Lines subtest of Figural Form A; the Circles subtest, Figural Form B; and Unusual Uses-Boxes subtest, Verbal Form A; and the Unusual Uses-Tin Cans subtest, Verbal Form B were the only subtests administered. The TTCT were designed to measure four aspects of creative thinking: fluency, flexibility, elaboration, and originality. Since the focus of the present investigation was on originality, the TTCT subtests were evaluated only in terms of originality.

Torrance (1974) summarized the results of several studies, with a variety of age ranges, as evidence for the test-retest reliability of the TTCT. Considering only the upper elementary age subjects and only the originality scale results, one finds a range of test-retest reliability coefficients from .60 to .88. Such coefficients indicate a range of the variance accounted for between the two administrations of 36% and 79%. While the lower coefficients raised concerns about the use of the originality scale as a dependent variable measure, it was judged that the reliability was sufficient for the purposes of the present study.

Evidence of construct, concurrent, and predictive validity for the TTCT is cited in the 1974 test manual. The construct validity studies referred to deal primarily with the relationship between personality variables and scores on the TTCT. For example, the TTCT is reported to correlate significantly with playfulness, strength of self-image, independence, and sense of humor. Concurrent validity is claimed by comparing scores of the TTCT with peer and teacher nominations of creative students. Regarding predictive validity, Torrance cites nine short-range (one week to nine months) predictive studies. The creativity scores in these studies predicted at the .01 level of significance (correlations were not reported) such creative behavior of elementary school children as humor, fantasy, and originality in imaginative stories. Five long-range predictive validity studies are reported. In the longest, a twelve-year study at the University of Minnesota High School, validity coefficients between originality scores and measure of quantity of creative achievements, quality of creative achievements, and creativeness of future aspirations were all significant at the .01 level ($r=.51$).

Anecdotal Record

The subjects were observed during pre-testing, treatment, and post-testing, and behaviors that were felt to be significant were recorded by the researcher. The observations were recorded either during the student's participation or as soon thereafter as possible.

Pre-Test and Group Assignment Procedures

Two subtests from the TTCT, Unusual Uses-Boxes from Verbal Test, Form A and Parallel Lines from Figural Test, Form A, served as pre-tests

and were group administered to fourth, fifth, and sixth grade subjects in their own classrooms. In addition to the standard TTCT subtest instructions, the following introductory remarks were read to each class:

> We are interested in learning about how students use their imaginations to think up new ideas. I think you will enjoy the two short activities we have for you today because you will have a chance to stretch and exercise your imagination. In each of the two activities we want you to think of the most interesting and unusual ideas you can, ideas that no one else in this group will think of. There will be a ten minute time limit on each activity. Try to keep thinking of ideas but if you run out of ideas before time is called, please sit quietly and wait until you are told to begin the second activity. If you have any questions after we start, please don't speak out loud. Raise your hand and I will come to you and try to answer your question. Are there any questions now before we begin?

Pre-tests were scored for originality and then subjects were randomly assigned by grade level into experimental and control groups. This insured approximately equal representation of each grade level in experimental and control groups and through randomization, approximately equal numbers of males and females in each group. A t-test for independent means showed no significant differences between total experimental and control group mean originality scores on the pre-test.

Treatment Phase Schedule

Following a four-week interval, the treatment phase of the study was scheduled as follows:

Sixth Grade			
	Experimental	3-12-81	8:45-9:30 a.m.
	Control	3-12-81	10:20-11:05 a.m.
Fourth Grade			
	Experimental	3-12-81	1:20-2:05 p.m.
	Control	3-12-81	2:20-3:05 p.m.
Fifth Grade			
	Experimental	3-13-81	8:45-9:30 a.m.
	Control	3-13-81	10:15-11:00 a.m.

This schedule was developed after consultation with the classroom teachers so as to minimize the disruption of their activities. The experimental group was scheduled first in each grade level solely as a convenience to the experimenter.

General Treatment Phase Procedures

The procedure for conducting the treatment phase required the students to be taken from their assigned classrooms to another room (cafeteria), as in no grade did the entire class participate as a single group. The experimenter went to each class, called out the names of the students for the experimental group, took the group to the cafeteria in the school, conducted the experimental group treatment, administered the post-test, and then returned the students to their classroom. Following the intervals noted in the preceding section, the experimenter returned to the same room and called for the students assigned to the

control group, took them to the cafeteria, conducted the control group treatment, administered the post-test, and then returned the students to their classroom. This procedure was followed for each grade level on the days and at the times noted in the preceding section.

Experimental Group Treatment Procedures

Once the experimental group subjects were seated in the cafeteria, the treatment was begun. The instructions to the experimental group, including the guided fantasy visualization, were as follows:

> All of us have seen movies. You know that through special techniques, movies can show us things that we might never see in "real" life.
>
> Did you know that we can make movies in our minds? These movies that we can see in our minds can show anything we want, things that are real and things that are imaginary. When we see imaginary things in our minds we are using our imaginations. Imagination is something that can help us to think up creative ideas. We are going to make movies in our minds of some things that you may have seen before and also of things that you have never seen.
>
> Now I would like you to feel you body becoming very relaxed./ [the / mark indicates a pause of between 10 and 20 seconds] Your breathing becomes deep and steady. All parts of your body are very relaxed./ Now you can put your head down and close your eyes if you wish and feel relaxed while at the same time your mind is quite alert and clear./

Now in your mind imagine you are in your bedroom at home. Look around your room./ See what is on the walls./ See all the furniture./ See all the small objects in your room./

Sometimes what you see in your mind will be very clear and sharp; other times it may be quite faint or hazy. Either way, let the pictures in your mind be as they are without trying to force them to change.

Now imagine you are back in your bedroom again. Have the light bulb in your room change color./ Have it change color again./ Now have it change size./ Have it change size again./ Have it change shape./ Have it change shape again./ Now have it take the shape of a light bulb again./

Let's imagine now that you are in a store. This store has many different things--food, clothing, games, and lots of other things. As you walk down an aisle you look at the items for sale and then you look quickly again because you notice that these items look like things you have seen before but there is one aspect of each thing that is different. It may be that its color is different or its shape or its size. For example, something that is usually quite small may be very large or something that is square may be round. Take some time to enjoy seeing all these ordinary things that are now unusual because they are different in one way./

Now as you walk down another aisle you are startled again by ordinary objects that look strange. You scan the items and

realize this time that all of them are as they usually are except that they have a part that is odd. Each item has a part that is something very different. Take some time now and enjoy seeing these items that look strange because one part has been replaced by something very different./

Now move to a different area of the store and see objects for sale that are so strange because they are really combinations of ordinary things. It's as if two or three ordinary objects have been blended together to make something very unusual and at the same time something that may be still useable. Take some time to enjoy looking and and picking up these unusual combination objects./

Now have a strange vehicle outside your house. Have it be different than any vehicle you have seen before. Take some time to study the unusual vehicle./

Now get into the vehicle. You can see the controls to make the vehicle go where you want it to go./ Travel very quickly in your vehicle to a land that is unlike any that you have seen before. Look out of your vehicle at this interesting place. Take time to observe all the shapes and colors you see./ Have your vehicle come down into this strange place and get out./ Have several friendly creatures nearby. Have their shapes, and colors, and sizes be whatever you like. Take some time to look at a few of these creatures./ Have one of the creatures come forward and invite you to visit the place where it lives. Have

a good time observing the unusual place where the creature lives. Take time to look at the outside and inside of its dwelling./ Have the creature show you some of his inventions. Observe and use some of these inventions./ Have a good time visiting the creature./ Say goodbye to the friendly creature and return to your vehicle. Have your vehicle take you back to your own house./ Enjoy remembering all the strange and interesting things you saw on your trip./ Now as you open your eyes you will feel alert and refreshed. Now I have two more activities that I think you will enjoy. They will give you a chance to stretch and exercise your imagination. In each of the two activities we want you to think of the most interesting and unusual ideas you can--ideas that no one else in this group might think of.

There will be a ten minute time limit on each activity. Try to keep thinking of ideas, but if you run out of ideas before time is called, please sit quietly and wait until you are told to begin the second activity. If you have any questions after we start, please don't speak out loud. Raise your hand and I will come to you and try to answer your question. Are there any questions now before we begin?

[At this point the examiner reads aloud the written instructions on the TTCT while the students follow along after which they begin the post-test.]

Control Group Treatment Procedures

Specifically, the control group subjects were given a maze and word-find, paper-and-pencil puzzle to work on for fifteen minutes. At the end of the time period they were given the two TTCT post-tests. The instructions to the control group were as follows:

> I have some activities for you this morning that I think you will enjoy. I'm going to hand three papers out to you. One is a maze puzzle and the other two papers are a word find puzzle. You can work on these puzzles for fifteen minutes and will be able to take them back to your classroom if you wish. At the end of the fifteen minutes I will have two different activities for you to work on.
>
> [after fifteen minutes] Now I would like you to turn your puzzle papers over. I have two more activities that I think you will enjoy. They will give you a chance to stretch and exercise your imagination. In each of the two activities we want you to think of the most interesting and unusual ideas you can--ideas that no one else in this group might think of.
>
> There will be a ten minute time limit on each activity. Try to keep thinking of ideas, but if you run out of ideas before time is called please sit quietly and wait until you are told to begin the second activity. If you have any questions after we start, please don't speak out loud. Raise your hand and I will come to you and try to answer your question. Are there any questions now before we begin?

[At this point the examiner reads aloud the written instructions on the TTCT while the students follow along, after which they begin the post-tests.]

Test Scoring and Inter-Rater Reliability Procedures

Scoring of the TTCT subtests was done by a paid scorer who is a certified elementary teacher. The scoring instructions in the TTCT manual as well as hypothetical responses were discussed by the researcher and the scorer prior to actual scoring. Adherence to TTCT scoring criteria and consistent application of scoring criteria were emphasized. The researcher randomly selected and then scored two pre-test protocols from each of the three grade levels. When these scores were compared with those of the paid scorer, an interscorer reliability coefficient of .96 was obtained for verbal originality and a coefficient of .92 was obtained for figural originality.

Chapter 4

RESULTS

This study was concerned with the effect that a guided fantasy visualization (GFV) would have on the verbal and figural originality scores of upper elementary school children. The mean figural and verbal originality scores of experimental and control group subjects were compared by means of a t-test of independent means to determine the treatment effect. The means and standard deviations for experimental and control groups on each of the four dependent variables are presented in Table 1. Neither of the null hypotheses could be rejected. Those subjects receiving a GFV did not differ from those subjects who had not received a GFV on post-test figural originality ($t = .24$, $p > .05$). Likewise, the two groups did not differ significantly on post-test verbal originality scores ($t = -1.12$, $p > .05$). Specifically, this would indicate that the GFV did not significantly improve verbal or figural originality test performance for a sample of upper elementary school children.

Experimental and control groups were compared at each grade level to help delineate any possible effect of age on the responsiveness to the GFV. Means and standard deviations for experimental and control groups at each grade level are presented in Table 2. The only significant difference at the fourth grade level occurred on the post-test figural originality scores in which subjects with a GFV were higher than those who did not have a GFV ($t = 2.48$, $p < .05$). Although at the fifth grade

no differences were found between groups, at the sixth grade level the subjects who did not receive the GFV had significantly higher mean verbal originality scores ($t = -3.08$, $p < .005$).

To further examine the effect of age on post-test originality, means were compared across grade levels and are presented in Table 3. A significant difference was found in favor of the sixth grade on pre-test verbal originality ($f = 3.92$, $p < .05$), and on post-test verbal originality ($f = 3.51$, $p < .05$).

In addition to analyzing age effects on originality scores, it was considered useful to compare the effects of a GFV within sexes. The means and standard deviations displayed in Table 4 indicate that males who received a GFV did no better on originality variables than males not receiving the GFV. The same was true for females.

Finally, originality scores were compared between sexes and means and standard deviations are presented in Table 5. The results indicate that neither sex was superior to the other on any of the originality variables.

Anecdotal Observations

Subject behavior at each grade level during the pre-testing was similar: students were attentive, cooperative, and in some cases enthusiastic. The fourth grade subjects differed to the extent that they seemed more restless and asked more questions than the older subjects. Classroom teachers were present during the pre-testing but not during the treatment and post-testing.

In the experimental treatment situation, subject response to the GFV was similar across grade levels. Very few subjects were able to

close their eyes, and there was frequent giggling and fidgeting displayed by some of the subjects.

Control group subjects appeared to be actively involved in solving the two paper and pencil puzzles for the fifteen minute time period allowed. A number of students conversed and compared papers, but this was not discouraged by the examiner.

In the post-test setting for both experimental and control groups, there appeared to be considerably more talking among subjects than had occurred during the pre-testing. Some of the talk appeared to involve either sharing ideas or comparing the quantity of responses produced. The examiner attempted to discourage these interactions by quietly reminding students that individual effort was the focus of the research study. These reminders were only partially successful in inhibiting student interaction during the post-testing.

Table 1

Mean Originality Scores and Standard Deviations for Children With and Without a Guided Fantasy Visualization

Originality Variables	n	Means	S.D.
Pre-test Figural			
With	30	19.70	6.49
Without	29	20.07	8.06
Pre-Test Verbal			
With	30	17.70	10.33
Without	29	19.86	13.87
Post-test Figural			
With	28	21.71	9.56
Without	28	21.07	10.80
Post-test Verbal			
With	28	23.07	14.68
Without	28	28.36	20.26

Table 2

Mean Originality Scores and Standard Deviations for Children Across Grade Levels With and Without a Guided Fantasy Visualization

	Grade		
	4	5	6
Originality Variables	Mean S.D.	Mean S.D.	Mean S.D.
Pre-test, Figural			
With	20.33 (9)[a] 6.12	21.71 (7) 6.13	18.29 (14) 6.99
Without	20.89 (9) 9.87	19.14 (7) 4.98	20.00 (13) 8.56
Pre-test, Verbal			
With	13.33 (9) 4.90	17.00 (7) 14.73	20.86 (14) 9.94
Without	14.33 (9) 10.08	16.14 (7) 8.07	26.17 (13) 16.90
Post-test, Figural			
With	24.89* (9) 10.42	16.83 (6) 5.91	21.77 (13) 9.96
Without	15.00 (9) 5.85	24.00 (6) 14.60	23.92 (13) 10.48
Post-test, Verbal			
With	26.33 (9) 13.59	20.67 (6) 23.32	21.92 (13) 11.09
Without	20.78 (9) 15.96	12.00 (6) 6.45	41.15* (13) 19.56

[a]Numbers in parentheses indicate number of subjects.

*$p < .05$, f-test comparison.

Table 3

Mean Originality Scores and Standard Deviations

by Grade Level

	Grade		
	4	5	6
Originality Variables	Mean S.D.	Mean S.D.	Mean S.D.
Pre-test Figural	20.61 7.97	20.43 5.53	19.11 7.68
Pre-test Verbal	13.83 7.70	16.57 11.42	23.31* 13.58
Post-test Figural	19.94 9.65	20.42 11.26	22.85 10.08
Post-test Verbal	23.56 14.66	16.33 16.93	31.54* 18.40

*p > .05, f-test comparison.

Table 4

Mean Originality Scores and Standard Deviations for Females and Males With and Without a Guided Fantasy Visualization

Originality Variables	Females Mean S.D.	Males Mean S.D.
Pre-test Figural		
With	20.85 6.56	17.40 6.10
Without	20.28 9.29	19.73 5.92
Pre-test Verbal		
With	16.05 7.27	21.00 14.63
Without	18.00 13.91	23.20 13.86
Post-test Figural		
With	21.39 8.52	22.30 11.68
Without	22.24 9.69	19.27 12.59
Post-test Verbal		
With	21.06 13.52	26.70 16.69
Without	27.18 20.65	30.19 20.50

Table 5

Mean Originality Scores and Standard Deviations

for Females and Males

Originality Variables	Females Mean S.D.	Males Mean S.D.
Pre-test Figural	20.58 7.85	18.62 5.97
Pre-test Verbal	16.97 10.82	22.10 11.96
Post-test Figural	21.80 8.98	20.71 11.96
Post-test Verbal	24.03 17.37	28.52 18.40

Chapter 5

DISCUSSION AND SUMMARY

Results from the present research indicated that a single guided fantasy visualization did not appreciably enhance the performance of upper elementary students on a test of figural and verbal originality. These results can be put into a more useful perspective when compared with the findings of several similar investigations.

One of the investigations that most closely approximates the present study is that of Bagley (1977). Bagley found that with a single exposure to a guided fantasy visualization college students displayed a significant gain on the TTCT Verbal in originality and fluency. There are several possible explanations for the difference in results between Bagley's investigation and the present study. One explanation centers on the obvious differences in ages between the two sample populations. The undergraduate students at the University of Tennessee were presumably more developed and stabilized cognitively and emotionally than the upper elementary students at Price Laboratory School. Following the theoretical position of Durio (1975) that imagery formation is no less cognitively sophisticated as an information coding system than is symbolic processing, one would expect that the more cognitively developed college students might be better able to integrate and utilize a once-offered guided fantasy visualization in a cognitive exercise such as creative problem solving.

Likewise, the more mature college students, when compared to upper elementary school children, might have found that closing their eyes and listening to the rather novel directions of the GFV to be less threatening or anxiety producing. The open-eyed giggling and fidgeting exhibited by some of the elementary students could be an indication that they felt anxious and perceived some threat rather than delight with the one-time treatment situation. The potential for anxiety might have been exacerbated for some of the elementary students by the fact that during the treatment period they went with an unfamiliar person, whose expectations and tolerances were not well known to them, to a location in which the classroom teacher was not present.

Another possible influence on the different outcomes between Bagley's study and the present research may be the actual content of the visualization treatment. At least 50% of the guided fantasy designed by Bagley was devoted to instructing students to visualize body parts containing switches that could be turned off to aid in relaxation. The other segment of the treatment did not specifically ask the subjects to visualize but that they incorporate as characteristic of themselves certain positive statements regarding creative personality traits.

The GFV in the present study devoted only two statements to relaxation and assigned the majority of the instructions to visualization of fanciful objects and combinations of objects. Given the emphasis on relaxation and the minimal focus on visualization in the Bagley study it might be questioned whether his results came from effects other than visualization.

A further aspect of GFV content should be considered. Bagley (1977), during his experiences in creativity workshops prior to beginning his research, noted that

> Many subjects not practiced in the structured fantasy technique reported that the insertion of large metaphoric leaps in the fantasy broke their concentration. For example, asking subjects to imagine holding a ball of clay, then willing the clay to form itself into a shape symbolizing some problem at hand, typically drew reports of momentary fantasy disruption. (p. 40).

In the present study subjects visualized their bedrooms, then a variety store, and finally unusual creatures in a strange land. It is possible in the present study that the requested leaps into fantasy were too large and too quick and thus the subjects, as in Bagley's observations, lost their concentration.

Bagley implied that these disruptions in subject concentration did not occur for subjects who were experienced with the guided fantasy visualization technique. This raises an important consideration: the role that practice plays in successful utilization of a GFV to stimulate creative thinking. Hershey and Kearns (1979) found that when gifted upper elementary students were given one-half hour per week for eight weeks of training in relaxation and guided fantasy visualization they significantly improved on verbal originality, fluency, and flexibility. It may be that this training, albeit limited, allowed the students to become comfortable with the guided fantasy visualization technique so

that preconscious influences on creative thinking could be tapped during the experimental treatment. It is also possible that the subjects' high intellectual level may have enhanced their ability to profit from GFV training.

Relaxation was an important aspect of the treatment in the Hershey and Kearns study as it was in the Bagley investigation. Other details as to the specific content of the GFV in the Hershey and Kearns study were not reported.

The salient points that emerge when comparing the aforementioned studies to the current investigation are subject age, length of GFV training, and GFV content. It would appear possible that as a person's age increases, fewer exposures to the GFV technique are required to significantly improve short-term creative problem solving. Conversely, as training in GFV increases, age may reduce in importance as a variable that affects creative thinking's responsiveness to GFV. In the present investigation the majority of subjects had neither the advantage of training nor of age. Likewise, if relaxation is an important content variable in a GFV's effectiveness as a creativity stimulant, then the Price Laboratory subjects were again at a disadvantage in the experimental treatment.

Regarding the importance of training in successful utilization of GFV as a stimulator of creative problem solving, the teacher of the Price Laboratory School fourth grade subjects reported after completion of the current investigation that she had periodically during the school year, asked the students to visualize situations that arose during

instruction, particularly in reading and social studies. These informal experiences with visualization were designed to enhance students' comprehension and memory of written material. No similar classroom experiences with visualization were reported by the teachers of the older subjects. It is interesting to note that the only significant difference in favor of the GFV group occurred at the fourth grade level on figural originality. Likewise, it is noteworthy that the fourth grade GFV group had a higher mean than the control group on post-test verbal originality although the difference did not reach significance. Also, although the fourth grade experimental subjects had a lower mean on the pre-test of verbal originality than experimental subjects in the fifth and sixth grades, the fourth graders had a higher mean verbal originality score following the GFV. In neither of these comparisons of experimental fourth grade subjects with older experimental subjects were the differences statistically significant. However, the apparent responsiveness of the fourth graders' short-term creative thinking to GFV may be an indication that practice in visualization, spontaneously integrated into the educational program, is helpful in allowing upper elementary age subjects to utilize a GFV to stimulate creative thinking.

The author's theoretical model, described in Chapter 1, hypothesized that a GFV would act as a triggering and releasing mechanism to cause past memories to combine in unusual ways in the preconscious and then be released into awareness for use in creative problem solving. According to this theoretical viewpoint, if images are not formed in response to a GFV, then it is not likely that preconscious stimulation and release

to consciousness will occur. The role of practice in the GFV technique may be to allow elementary-age subjects to become more skilled, and possibly less inhibited in forming fantasy images which then can act on the preconscious. Specifically, practice in GFV would serve to increase the upper elementary student's cognitive skill in image formation as well as promote his/her emotional comfort with the GFV process in a group setting.

On the basis of the findings of the present study and the comparison with related research studies, several guidelines can be proposed for future research with the GFV technique as a stimulus to creative thinking. The relationship between age and GFV training as that relationship pertains to the enhancement of creative problem solving needs further investigation. It would be useful to delineate the minimum training needed at various age levels to significantly influence creative thinking as well as to discover at what point in the GFV training program creativity gains level off.

The influence of specific GFV contents on creative thinking needs to be investigated. Is relaxation instruction a necessary component in GFV? How do the GFV instructions need to vary for different age groups? What is the influence of varying mixes of instruction to visualize specific content and instructions that are loosely structured and abstract in nature?

In terms of GFV procedures and setting it would be of interest to discover ways to insure that students had been given enough time to visualize a scene before receiving new instructions. Effective ways to

introduce and terminate the GFV need to be worked out and it would be useful to clarify the influence of lighting, environmental sound, and seating arrangements on receptiveness to the GFV.

The Torrance Test of Creative Thinking is the most widely used measurement of creative thinking. However, the TTCT is limited by its paper and pencil format and questionable long term predictive validity. The effect of a GFV on creativity might in the future be measured in a variety of ways, one of which could be the judgment of experts regarding the originality of "real-world" creative products, be they sculptures, poetry, or unique solutions to business problems.

Finally, future research might be directed toward investigating the influence of personality and cognitive variables as they interact on the relationship between GFV and creative thinking. For example, do persons with certain personality traits gain more in creative thinking from experience with GFV than other persons? Regarding cognitive qualities, it would be interesting to know if persons with the capability to visualize vividly respond creatively to a GFV more than persons with less vivid imagery. A similar question would pertain to the differential response of high creatives versus low creatives to a GFV.

Summary

The purpose of the present research study was to determine the effect that a single guided fantasy visualization would have on the figural and verbal originality scores of a sample of upper elementary school children. Fifty-nine children from the fourth, fifth, and sixth grades at Price Laboratory School in Cedar Falls, Iowa, were pre-tested on one figural

and on one verbal subtest from the Torrance Test of Creative Thinking (TTCT). These subtests were scored only for originality. Subjects were randomly assigned by grade level into experimental and control groups. Four weeks later experimental subjects at each grade level were given a fifteen-minute guided fantasy visualization (GFV) followed immediately by post-testing with two alternate form TTCT figural and verbal subtests. Control subjects were given word puzzles and mazes to work prior to TTCT post-testing. Fifty-six of the original fifty-nine subjects participated in post-testing.

Results indicated that the group receiving the GFV did not achieve significantly higher mean figural and/or verbal originality scores than the group that did not have the GFV. Data analyzed by grade level indicated that the fourth grade GFV subjects were significantly higher in figural originality than the fourth grade control subjects, and that sixth grade control group subjects had higher mean verbal originality scores than sixth grade GFV subjects. No differences in mean originality scores by sex were found.

The findings of the present study were interpreted in light of the results of two similar investigations. The important influences of age, prior experience with GFV, and GFV content on the effectiveness of a GFV as a stimulator of creative thinking were discussed. Based on the findings of the present study, recommendations for future research were suggested.

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EVALUATING THE EFFECT OF A GUIDED FANTASY VISUALIZATION ON THE FIGURAL AND VERBAL ORIGINALITY OF UPPER ELEMENTARY STUDENTS

An Abstract of a Thesis

Submitted

In Partial Fulfillment

of the Requirements for the Degree

Specialist in Education

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ABSTRACT

This study investigated a method for stimulating several aspects of short-term creative thinking. It was hypothesized that the figural and verbal originality scores of students receiving a guided fantasy visualization (GFV) would be significantly different from those scores of students not receiving a GFV.

Fifty-six children from the fourth, fifth, and sixth grades of Price Laboratory School, Cedar Falls, Iowa, were pre-tested on one figural and one verbal subtest from the Torrance Tests of Creative Thinking (TTCT). After scoring the subtest on the originality scale only, students were randomly assigned to experimental and control groups. Following a four week interval, experimental group students at each grade level were given a 15-minute GFV in which they listened to instructions to visualize fanciful objects and situations. Immediately following the GFV, students were administered two alternate form TTCT figural and verbal subtests. Students in the control group were given a paper-and-pencil word puzzle and a maze to work on for 15 minutes prior to TTCT post-testing. All students completed treatment and post-testing procedures outside the classrooms with their teachers not present.

Results indicated that students receiving the GFV did not achieve significantly higher mean figural and/or verbal originality scores than students who did not have the GFV. Data analyzed by grade level indicated that the fourth grade GFV students were significantly higher in figural originality than the fourth grade control students and that

students in the sixth grade control group had higher mean verbal originality scores than sixth grade GFV students. No differences in mean originality scores by sex were found.

Results of the present study and two similar investigations suggest the possibility that upper elementary students need considerably more experience with the GFV than college students for the GFV to have a significant effect on short-term creative thinking. Additionally, the results indicate that the contents of a GFV may need to include a substantial amount of relaxation instruction before a GFV can produce a change in creative thinking. Finally, based on the findings of the present study, recommendations for future research were suggested.