

AN ABSTRACT OF THE THESIS OF

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Title: An Investigation of Perceived Levels of Creativity in Freshmen
and Senior College Males

Abstract approved: Roberta L. Daniels

This study was conducted to investigate the perceived levels of creativity of freshmen and senior male students at Emporia State University in Emporia, Kansas, as measured by the What Kind of a Person Are You? inventory (Khatena & Torrance, 1976) pre- and posttest creative perception index scores. The specific hypotheses were formulated to determine if there were any significant differences relative to freshmen and senior males; experimental and control groups; the three schools of concentration, Education and Psychology, Applied Arts and Sciences, and Liberal Arts and Sciences, as well as What Kind of a Person Are You? (WKOPAY) pre- and posttests for the entire group of 36 male subjects.

The methodology of the study included the administration of the WKOPAY inventory and the administration of 20 individual training activities to the experimental group. These 20 activities were representative of the current training techniques for developing creativity by many professionals as described in the theory section of the

manuscript. The control group participated in the WKOPAY pre- and posttest but did not take part in the training activities. The results failed to indicate significant differences relative to freshmen and senior males, the three schools of concentration, and WKOPAY pre- and posttest scores. No significant difference was found to exist between the experimental and control groups. These results substantiate the findings of Daniels (1981) that University and social influences have attenuated creative perception in freshmen and senior male college students. It is possible that the training activities which were utilized in this study are an effective means of increasing creative perceptiveness as evidenced by the higher posttest scores of the experimental group relative to the control group. However, as noted earlier, the difference between the two groups was nonsignificant. Future studies may obtain more positive results if more extensive and prolonged training is administered.

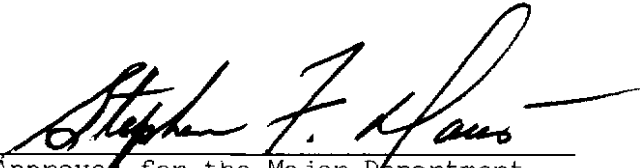
AN INVESTIGATION OF PERCEIVED LEVELS OF
CREATIVITY IN FRESHMEN AND
SENIOR COLLEGE MALES

A Thesis
Presented to
the Department of Psychology
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. . . . To Maggie whose love
and understanding helped
me go when the
going was tough

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Chapter 1

INTRODUCTION

In the past, our society has generally encouraged, supported, and produced convergent or noncreative type thinkers. This means that originality as a form of creativity has been suppressed. Informational regurgitation is often rewarded in the form of high grades in school. Institutions of higher learning have placed little emphasis on the training of gifted and creative students. The assumption seems to have been that students who possess creative potential learn no differently from other young people (Heist, 1968). According to McConnel (Note 1), students are being pressured to conform to long standing university and community standards, and consequently creative responses are seldom recognized or encouraged.

According to Torrance (1970) creativity is initially inhibited in the early elementary grades. Independence in judgment, courage in convictions, and participation in creative activities are frequently discouraged and/or suppressed. Parents and teachers are frequently frightened by this creative behavior because it is contrary to their training and with what they are most comfortable.

Creativity is a very complex entity to define and as such, most definitions emphasize the following components: an instance of behavior, development of distinctive products, varied mental processes, personality transformations, and/or relevance to a particular environment (Daniels, 1981). Mooney (1957), Roweton (1970), Torrance (1970), and

Welsh (1973) refer to these components as the person, process, and product.

Creativity, as classified by Roweton (1970), includes only the process and product orientations. The process orientation includes the definitional, dispositional, and psychoanalytic approaches. The definitional approach is based on introspection and speculation. It is the least objective and rigorous of all the approaches. The dispositional approach utilizes individual measures such as personality inventories and cognitive measures to investigate personality correlates of creativity. The experimental method is a verification utilized in the dispositional approach; however, it is more objective than the definitional approach. The psychoanalytic approach is based on the findings of humanistic and clinical psychology. Anxiety reduction (Nydes, 1962) and sublimation of libidinal energy are key psychoanalytic concepts.

The product orientation as described by Roweton (1970) includes both the S-R behaviorist and operational approaches. The S-R behaviorist approach utilizes findings from associative and reinforcement theories. The Remote Associates Theory (Mednick, 1962) is the most influential theory in this area. This theory is discussed in detail in the theory section of this manuscript. The operational approach encourages creativity training programs such as group problem solving and the institute for creative problem solving.

Creativity as defined and classified by Mooney (1957) includes the person, the product, the process, and the environmental orientations. The person orientation consists of the pattern of characteristics which identifies creative persons or separates them relative to a particular

unique talent. Products are observable and are of particular interest as products are ultimately made available to the public.

The creative process is important because creative individuals can share their wisdom to benefit others. The environment consists of circumstances and stimuli relevant to creative production. The four dimensions according to Mooney (1957) may be useful relative to the assessment of individual needs and interests.

Torrance (1970) defined creativity relative to the person, product, and process. He places emphasis on becoming sensitive to problems, solving them and communicating the results. His definition is indicative of modern creativity training procedures which utilize and synthesize information from a variety of creativity models and approaches.

Theories of Creativity

In addition to the classification of various definitions of creativity it is also important to explore the numerous theories of creativity. Most theoretical models are as diverse as the definitions concerning creativity. A brief review of seven theories has been described in the following sections of the manuscript.

The Remote Associates Theory of Creativity

Creativity according to Mednick (1962) is any condition which tends to bring the associative elements together. As the process progresses, the speed and probability of creativity increases. There are three ways in which this is achieved.

1. Serendipity--The associative elements are evoked into accidental environmental appearance.

2. Similarity--The associative elements are evoked as a function of similarity. They share a common attribute but otherwise are different.

3. Mediation--The associative elements are evoked by mediation of common symbols (Mednick, 1962, 221-222).

In the associative hierarchy Mednick (1962, 222-223) illustrated how individual differences are incorporated into the associative theory. An individual with a "steep associative hierarchy" would tend to be restricted to one or two stereotypic responses and would be less creative than a person with a "flat associative hierarchy." The individual with a "flat associative hierarchy" would tend to have more responses than an individual with a "steep associative hierarchy."

An example is utilized here to provide clarification of the terms "steep" and "flat" hierarchy. Assume an experimenter presented a subject with the word "fish." The individual characterized by a "steep" hierarchy would be restricted to the stereotypic responses, "hook," "line," and "rod" and the individual's responses would end immediately. The creative individual characterized by a "flat associative hierarchy" would more often respond with many varied and remote responses to the word fish, such as "lure," "boat," and "water." These remote associations, flat associative terms, are the basis of creative production according to Mednick.

It is apparent that Mednick's theory fits the Roweton (1970) S-R behaviorist approach because of the emphasis on association relative to verbal creativity. The Remote Associates Test was developed from this theory and is described in the assessment instrument section of this manuscript.

The Structure of Intellect Theory

Guilford created the Structure of Intellect (SI) model in 1959 and provided great impetus to the study of intelligence. Divergent production is one of five operations in the SI model and it measures various aspects of creativity. Properties such as fluency, flexibility and elaboration are measured in the creativity component.

According to Guilford (1959) creativity is present in everyone in a multitude of differing degrees. The method or procedure for the assessment of creativity is complex. Multiple predictions and multivariate procedure are necessary according to Guilford (1971) for an adequate assessment of creative ability.

Creativity can be fostered according to Guilford (1967), by the utilization of systematic methods such as: morphological analysis, brainstorming, attribute listing and ideation. Any one method or combination promotes the building of self-confidence, initiative, and inquisitiveness.

As noted earlier, the Structure of Intellect (SI) model is not strictly a theory of creativity. The divergent production component which refers to creativity may be classified relative to the Roweton (1970) operational approach of the product orientation due to the emphasis on creativity training. Guilford is an advocate of the factorial approach to studying creativity; that is, he believed that there were many different components of creativity and many ways of producing creative responses or products (Daniels, Note 2, 32).

The Reciprocal Theory

The theory of creativity as espoused by Gordon (1977) addresses the process and person orientations and conceptualizes creativity relative to four stages as described below. The creative process as described by Gordon (1977) depends on an individual's ability to mobilize contradictory, but mutually reciprocal qualities. There are four stages in the development of creativity that are consistent with the reciprocal theory.

The four stages are:

1. Preparation Stage--The person becomes involved with the problem.

The person is drawn into a period of struggle.

2. Incubation Stage--A person sleeps on it. He feels baffled, confused, or ignorant.

3. Inspiration Stage--A person experiences insight as a solution appears.

4. The Coming Down to Earth Stage--The stage of critical testing and finding of relevant solutions (Gordon, 1977, 116).

Gordon (1977) stressed the importance and relative duration of each stage in that it varies from one person to another in terms of a transformation between birth and death. Gordon (1977) further asserted that birth involves assuming control and responsibility in life, while death is concerned with chaos and the unknown. People who can adapt to the unknown without panic, pain, or resentment and assume control and responsibility in life have the greatest creative potential according to this particular theory.

This theory may be included in the Roweton (1970) psychoanalytic approach of the process orientation because of the emphasis upon birth and death. It may also fit the Mooney (1957) process and person

categories because of the emphasis on stages of the creative process and reference to characteristics of creative individuals.

The Environmental Theory

The environmental theory developed by Torrance (1970) incorporates the utilization of reinforcement techniques to increase the probability of creative behavior. Creativity has been defined by Torrance (1970, 1) as a process of becoming sensitive to problems, identifying the apparent difficulty, searching for solutions, formulating hypotheses about the deficiencies, testing and retesting the hypotheses and communicating the results. According to Torrance (1970) a positive environment which encourages originality enhances the preceding process. According to Torrance (1970) creativity may be enhanced if parents respect the questions children ask, encourage opportunities for practice, and reward original thinking.

Several requisite circumstances are mentioned by Torrance (1970) which facilitate the creative process. These personality needs are described as follows:

1. Curiosity Needs--These needs enable a child to explore the environment. These needs will determine how a child will develop his creative potential.
2. The Need to Meet a Challenge--This need involves attempts at difficult tasks, exploring the unknown, being different, and testing the limits.
3. The Need to be Honest--This need involves self-strength, initiative, and assertiveness.

4. The Need to Give Oneself Completely to a Task--This need involves the process of being absorbed in a task. Extraneous environmental stimuli are tuned out (Torrance, 1970, 15-22).

The person, process, and product aspects of creativity are reflected in the Torrance (1970) environmental theory. The dispositional, S-R behavioristic and operational approaches as described by Roweton (1970) are relevant to this theory as the investigation of personality correlates of creativity, reinforcement procedures, and training programs are emphasized. Torrance, like many other theorists is an eclectic relative to a theory of creativity (i.e., he has incorporated the person, product, and process) in addition to defining creativity and formulating a theory of creativity. Torrance has also been instrumental in the development of assessment devices to measure and predict creative behavior. Two of his instruments are discussed in the assessment section of the manuscript.

The Cognitive-Environmental Interaction Theory

No universal definition or measurement technique relative to the creative process currently exists. Khatena (1978) ascribes to a definition relative to terms of originality. Creativity involves breaking away from old habits so as to restructure ideas, thoughts and feelings into novel and meaningful bonds (Khatena, 1978, 241).

The left hemisphere of the brain was identified by Khatena (1979) as the area involving divergent production, while the right hemisphere of the brain is involved in convergent production and is critical in producing imagery, the vehicle through which incubation produces creativity. Incubation is a relaxed state prior to creativity.

Preparation is associated with the left hemisphere and involves the acquisition of knowledge and skills.

Creativity can be enhanced by imagination restructuring, synthesis, and production of analogies. These training procedures are described by Torrance (1977) as follows:

1. Imagination--This is a strategy which is utilized in breaking common habits.
2. Restructuring--This is a process of disassembling elements and recombining in a different way to produce an original identity.
3. Synthesis--Synthesis, unlike restructuring, provides freedom of manipulation and expression. Elements are combined to produce the new and original.
4. Analogy--This process involves the communication of thoughts, feelings, and expressions that do not lend themselves to easy explanation by relating them to a familiar situation.

The cognitive environmental interaction theory can be classified relative to the Roweton (1970) dispositional approach due to the emphasis on personality characteristics, the S-R behavioristic orientation because of the emphasis on the associative description of incubation, and to the operational orientation because of the emphasis on training. Khatena (1977) advocates a system which synthesizes various techniques and theoretical findings to foster creative potential.

The Threshold Variable Theory

According to Gowan (1972) creativity is a product of developmental stages. The creative process Gowan describes is a series of maturation stages with an accompanying energy transformation. The stages include

trust, autonomy, initiative, industry, identity, intimacy, generality, ego integrity and agape love. These stages are divided into three categories: latency, identity, and creativity. The three categories are defined as follows:

1. Latency--refers to change and experience. The latency category includes the stages named as trust, industry, and generativity.

2. Identity--refers to the ego and involves being different, prodding introspection and defiance of authority. The identity category includes the stages named as autonomy, identity, and ego integrity.

3. Creativity--refers to the love relationship as it develops from self love to heterosexual love. The creativity category includes the stages named as initiatives, intimacy, and agape love (Gowan, 1972, 56).

A periodic chart combining and comparing Gowan's, Erickson's and Piaget's theories illustrates the stages through which creativity is developed. This periodic chart by Gowan (1972, 28) may be observed in Table 1.

The chart illustrates the interaction between the three categories or views of the world, and the nine stages. The interaction is important according to Gowan, because man can not comprehend all the aspects of reality at once. Reality is easier to comprehend if ordered through a succession of partial views. The developmental process is not a smooth progression. Therefore, the transformation of energy mentioned earlier can not be expended on the three categories or views of the world simultaneously. Energy must be expended separately through each of the three categories (Gowan, 1972).

Table 1

A Periodic Chart Pertaining to Gowan's, Erickson's,
and Piaget's Developmental Stages

		LATENCY	IDENTITY	CREATIVITY
		3 it, they	1 I, me	2 thou
		THE WORLD	THE EGO	THE OTHER
INFANT	Erikson	1	2	3
	Piaget	TRUST	AUTONOMY	INITIATIVE
	Mode	Sensimotor	Preoperational	Intuitive
	Erikson Virtues	none	imperative	optative
	Age	Drive-- hope	Self-control-- willpower	Direction-- purpose
YOUTH	Erikson	4	5	6
	Piaget	INDUSTRY	IDENTITY	INTIMACY
	Mode	Concrete operations	Formal operations	(Creativity)
	Erikson Virtues	interrogative	subjunctive	
	Age	Method-- competence	Devotion-- fidelity	Love-- affiliation
ADULT	Erikson	7	8	9
	Erikson Virtues	GENERATIVITY (Psychedelic)	EGO-INTEGRITY (Illumination)	(AGAPE--LOVE)
	Age	Production-- care	Renunciation-- wisdom	
		26-40	40-onward	

Note. From Development of the creative individual by J. C. Gowan, San Diego: Robert R. Knopp, 1972.

The Gowan threshold variable theory can be classified according to Roweton's psychoanalytic approach and process orientation (Daniels, Note 2). Gowan stressed the idea that practice and encouragement are critical to the development of creativity.

The General System Theory of Creativity

According to Parnes (1977), a "general system" refers to man's interrelationship with the total universe. We are gathering, storing and processing data every day to meet our needs and objectives. Parnes (1977) defines creativity relative to our ability to produce creative responses from the data we have on file in our brains.

The Creative Problem Solving Institute (CPSI) was designed as a system to help maximize the interrelationships we make with the vast amount of data which the brain stores. Creativity involves forming new and relevant associations among the data. Parnes (1977) noted there were five processes that enable us to form new and relevant association for optimal creative potential: fact finding, problem finding, idea finding, and acceptance finding.

The CPSI system stresses flow and spontaneity. The flow of thoughts can be directed toward an accomplishment by controlling external and internal factors mutually. In other words, the environmental influences and inner self are controlled. The system stresses and encourages sensitivity to problems, experimentation, and synthesis to meet present and future needs creatively. According to Parnes (1977) the CPSI system integrates and synthesizes findings from the diverse theories of creativity, and is an eclectic theory. The CPSI stresses the development of creativity in each individual at all levels.

This general system theory is representative of the Roweton (1970) operational approach because of the emphasis on training creativity, and the S-R behavioristic orientation relative to the association of data in

the brain. The CPSI is truly representative of the current trend of combinational approaches in creativity training.

Creative Assessment Instruments

There are a variety of creativity assessment instruments available to researchers, educators, and psychologists. These instruments claim to measure some aspect of creativity. Virtually all creativity training programs stress that individual's attitudes and interests should be modified for optimal creative behavior development to occur. Thus, researchers and educators should consider the use of attitude and personality instruments. Four of these instruments are reviewed in this section of the manuscript. The following tests, inventories, and check-lists have been selected for review: Torrance Test of Creative Thinking, Remote Associates Test, Creative Disposition Scale, How Do You Think Inventory, Group Inventory for Finding Creative Talent, Something About Myself, and What Kind of a Person Are You?

Torrance Test of Creative Thinking (TTCT)

The Torrance Test of Creative Thinking (TTCT) (Torrance, 1966) was designed to measure four aspects of creativity related to either verbal or figural. Included are the dimensions of fluency, flexibility, originality and elaboration which are defined as follows:

1. Fluency--the ability to think and form creative associations rapidly.
2. Flexibility--the ability to adapt creatively to a variety of situations.

3. Originality--the ability to respond in a novel and unique manner.
4. Elaboration--the ability to communicate creative concepts.

Figural and verbal scores are provided for each of the four dimensions.

Reliability data relative to the test-retest method varied from .35 to .73 for a three-week interval. Interscorer reliability (Hoepfner, 1967) ranged from .76 to .99. The variability of the test-retest reliability, according to Hoepfner (1967), was probably due to fluctuations in the motivational states of the subjects. Updated norms and a better association of the test to real life creative behavior (Baird, 1974, 836-837) are needed. The TTCT is useful but it should be utilized with caution until more current normative information is provided.

The Remote Associates Test (RAT)

The Remote Associates Test is based on the Mednick (1962) associative theory of creativity. Two forms are available from age nine to adult and each form contains ten items which measure the subject's ability to see relationships between apparent dissimilarities. The test is heavily weighted with verbal intelligence and thus may be inappropriate for measuring other forms of creativity (Backman & Tuckman, 1972). Numerous convergent thinking items are present which are contrary to creative thinking.

An odd-even reliability coefficient of .90 was reported by Davis and Belcher (1971). The validity of the RAT is questionable according to Backman and Tuckman (1972) and Davis and Belcher (1971), as it has little relationship to other forms of creativity such as problem solving, as correlations between the RAT and non-verbal measures of the Torrance

Test of Creative Thinking (Torrance, 1974) ranged from .02 to .14 (Clark, 1974).

Further research is necessary to establish appropriate reliability and validity data. Until such information is available the utility of this instrument is questionable for assessing creativity.

The Creative Behavior Disposition Scale (CBDS)

The Creative Behavior Disposition Scale (CBDS) by Taylor, Sutton, and Haworth (1974) provides measures of expressional creativity, characterized by freedom; technical creativity, characterized by skill; inventive creativity, characterized by ingenuity; innovative creativity, characterized by new ideas; and emergence creativity, characterized by the origination of a new idea. The adult paper and pencil instrument consists of 75 behavioral items. Each item is responded to on a scale of zero to one hundred which indicates the degree the subject feels the item reflects his behavior.

Reliability data (Taylor, Sutton, & Haworth, 1974) is adequate as split-half coefficients of .82 and .96 were reported. Validity is moderately high as expressive disposition correlated .46 relative to figural fluency, .42 relative to figural originality, and .49 relative to verbal originality. No other validity or reliability data was reported.

The CBDS has potential in assessing persons self perceptions, and may be helpful in diagnosing strengths and weaknesses pertaining to expressional technical inventive, innovative, and emergence creativity. However, reliability and validity data are limited and further research is warranted.

The How Do You Think Inventory
(HDYTI)

The How Do You Think Inventory (HDYTI) (Davis, 1975) is a biographical instrument designed to assess the attitudes, interests, personality correlates, and values that underlie creative behavior. Two forms of the HDYTI are available. Form B contains 102 items and Form D contains 80 items. Each item is a creative or non creative characteristic which is circled if it applies to the subject's behavior.

Reliability coefficients were .93 on Form B and .81 on form D (Davis, 1975). The validity criterion consisted of a creative rating (1-13) based on students' creative performances on a creativity project.

The project consisted of the administration of the HDYTI to a group of 63 students on the first day of a graduate class in creative thinking. About two and one-half months later as part of the course requirements, students turned in a creative writing project, ideas for two inventions, and ideas for a creative teaching strategy.

Form B correlated .42 ($p < .01$) with the validity criterion for the total sample of 62 college students. Validity coefficients for the 15 males and 47 women was .64 ($p < .01$) and .36 ($p < .01$) respectively (Davis, 1975). Validity coefficients relative to form D were .46 ($p < .05$) for 21 males and .35 ($p < .01$) for females. The HDYTI has adequate reliability and validity, although more normative data relative to males is required. The HDYTI may be a useful device for screening person's attitudes relative to creativity.

The Group Inventory for Finding
Creative Talent (GIFT)

The Group Inventory for Finding Creative Talent (GIFT) (Rimms & Davis, 1976) was based on the results of the How Do You Think Inventory (Davis, 1975). According to Davis the inventory may be used for screening elementary and secondary students for programs of the creatively gifted. It is a group test and is relatively easy to administer and score. The GIFT is available in a primary (grades 1 and 2), elementary (grades 3 and 4), and upper elementary (grades 5 and 6) form. The upper elementary form contains 36 items and the primary and elementary forms contain 25 items. Each item is a creative or non-creative characteristic which is to be circled if it applies to the subject's behavior.

Reliability coefficients for the primary, elementary, and upper elementary forms were .55, .69, and .68 respectively (Rimms & Davis, 1976). Test-retest reliability over a six-month period based on 126 students was .56. Interrater reliability coefficients ranged from .75 to .85 relative to stories, and .78 to .79 relative to pictures.

Validity criterion (Rimms & Davis, 1976) consisted of teacher nominations for creative ideas, and experimenter ratings of short stories and pictures based on a five point scale. For the total population correlations between test scores and the criterion were significant, $r = .30$, ($p < .01$). Correlations between the criterion and GIFT scores of grades three through six were significant, $r = 2.7$, ($p < .05$), $r = .35$, $.35$, $.32$ and $.39$ ($p < .01$).

There is apparently a tendency for GIFT validity to increase with higher grade levels (Rimms & Davis, 1976). According to Rekdal (1977) this tendency may indicate that GIFT may place low expectations relative

to children's creativity. However, the GIFT inventory has acceptable reliability and validity, and appears to be valuable for creativity assessment and research.

The Khatena-Torrance Perception Inventory

The Khatena-Torrance Creative Perception Inventory is comprised of two separate measures of creative perception, the What Kind of a Person Are You? (WKOPAY) and the Something About Myself (SAM) inventories (Khatena-Torrance, 1976). The WKOPAY is based on the rationale that each individual has a psychological self which incorporates creative and non-creative ways of thinking. The SAM is based on the rationale that creativity is reflected in the personality characteristics, thinking strategies and emerging products of the individual. The Khatena-Torrance Creative Perception Inventory as a whole can be described as a biographical measure of creative perception. According to Khatena (1977) educators, businessmen, parents, and psychologists may utilize the inventory for identifying creative individuals. The two inventories are described separately in the following pages of the manuscript.

Something About Myself Inventory (SAM)

The Something About Myself Inventory (SAM) (Khatena, 1971) is a biographical checklist which provides an index of an individual's creative perception. The inventory is based on the rationale that creativity is reflected in the personality characteristics, thinking strategies and emerging creative products of the individual (Khatena & Torrance, 1976). There are six factors relative to the creative orientation. The six factors are: environmental sensitivity, initiative,

self strength, intellectuality, individuality, and artistry. The six factors are described as follows:

1. Environmental Sensitivity--openness to ideas of others, humor, interest in beauty.
2. Initiative--playing leads in dramatic and/or musical productions, producing new formulas or products.
3. Self Strength--self-confidence in matching talents against others, resourcefulness, willing to take risks.
4. Intellectuality--curiosity, enjoyment of challenging tasks, imagination, preference for adventure over routine.
5. Individuality--working by oneself, being a self starter, critical of others, working for long periods of time without getting tired.
6. Artistry--production of objects, models, paintings, carvings, musical compositions, plays, poems, and other literary pieces (Khatena & Torrance, 1976).

Reliability relative to interscorer ratings is high, $r = .99$, ($p < .01$). Internal consistency was determined using the split-half method. Odd and even items were correlated with coefficients of .92, .95, .94 for adolescent, adult, and adolescent-adult groups respectively. Construct validity was determined when high creatives compared with low creatives as measured by SAM were found to be significantly more original on two other tests, Sounds and Images, $t = 2.19$, ($p < 2.19$) (Torrance, 1975); and Onomatopoeia and Images, $t = 2.15$, ($p < .05$) (Khatena & Cunnington, 1973). Content validity was established via the comparison of SAM scores with the Children's Version of Sounds and Images and Onomatopoeia and Images. Correlations ranged from .20 to

.39 ($p < .05$) for Sounds and Images, and .15 to .34 ($p < .05$) for Onomatopoeia and Images.

The reliability and validity data of SAM is excellent. According to Khatena (1976) this inventory has a wide range of applications. It may be used as a screening or diagnostic tool assessing an individual's strengths and weaknesses or as a research instrument.

What Kind of a Person Are You? (WKOPAY)

The What Kind of a Person Are You? inventory (WKOPAY) (Khatena & Torrance, 1976) is based on the rationale that each individual has a psychological self whose structures have incorporated creative and non-creative ways of thinking and behaving. The test consists of 50 forced choice items designed to measure an individual's creative perception (Khatena & Torrance, 1976). The WKOPAY includes five factor scores which are described below:

1. Acceptance of Authority--obedient and conforming behavior.
2. Self-Confidence--well adjusted, thorough, curious.
3. Awareness of Others--courteous, socially well adjusted, considerate of others.
4. Disciplined Imagination--energetic, persistent, industrious.
5. Inquisitiveness--self assertive, emotionality (Khatena & Torrance, 1976, 18-19).

Factor analysis (Khatena, 1977) revealed that acceptance of authority was a non-creative orientation, and disciplined imagination was a creative orientation. Self-confidence, inquisitiveness, and awareness of others are comprised of both creative and non-creative elements. Thus, the more creative individual would be expected to score

low on acceptance of authority and high on disciplined imagination. The reverse would be true for the less creative individual.

Reliability data relative to the test-retest method was .86 ($p < .01$) (Joesting & Joesting, 1973). Other reliability coefficients relative to the test-retest method (Torrance & Khatena, 1970) includes .97 for test occurring within the same day, .71 for a week, and .71 for a month.

Construct validity (Torrance, 1976) was established via correlations between WKOPAY and Sounds and Images (Cunnington & Torrance, 1965), $r = .75$ ($p < .05$); imaginative stories, $r = .73$ ($p < .01$); Onomatopoeia and Images (Khatena, 1969), $r = .48$; and the Provocative Questions Test (Torrance, 1966), $r = .60$ ($p < .01$).

This instrument was deemed appropriate due to its relationship with the Torrance (1970) environmental theory. The person, product and process orientations are present in the theoretical model. Either instrument would have been appropriate for this particular study. The study completed by Daniels (1981) utilized the SAM and this author assumed it would be valuable to conduct a similar study utilizing WKOPAY. It would be interesting to compare results of the two instruments from the results of this study and the 1981 study by Daniels.

Further, it would be interesting to compare the SAM and WKOPAY relative to the type of items each test has to establish whether different types of test items influence creative perception index scores. The WKOPAY, as mentioned earlier, contains creative and non-creative forced choice items relative to socially acceptable and non acceptable situation while the SAM contains characterological items in which the subject is

asked to circle those items which most accurately apply to himself or herself.

The SAM and WKOPAY inventories have adequate reliability and validity, especially in comparison to the other tests which have been reviewed in this section of the manuscript. The HDYTI and GIFT inventories appear to have limited use. However, the SAM and WKOPAY are easier to score and administer and provide useful and valuable information related to the measurement of creative perceptions and attitudes.

Chapter 2

METHOD

Subjects

Thirty-six freshmen and senior male undergraduate students of Emporia State University, Emporia, Kansas, enrolled in English, psychology, speech, and sociology classes served as subjects in this study. These classes were considered to be representative of the Schools of Education and Psychology, Applied Arts and Sciences, and Liberal Arts and Sciences.

It must be noted at this point that the 36 males were the subjects who completed the pre- and posttests of What Kind of a Person Are You? (Torrance, 1976) out of a total of 69 male students in the 25 classes sampled. The individual classes were randomly assigned to an experimental and a control group. Males were chosen for this study because of the experimenter's interest in creativity and in comparing the results with a similar study utilizing college males by Daniels (1981).

Assessment Materials

The What Kind of a Person Are You inventory (WKOPAY) (Torrance, 1976) was administered to both the experimental and control groups. The 50-item biographical inventory is based on the rationale that individuals have underlying psychological structures which incorporate creative and non-creative ways of thinking and behaving. The 50 individual items

require a choice between two socially desirable characteristics in some instances and two socially undesirable characteristics in other instances. The WKOPAY results in a creative perception index score and five individual factor scores: acceptance of authority, self-confidence, inquisitiveness, awareness of others, and disciplined imagination. The inventory is easily administered to adults and adolescents in groups or individually and is usually completed in five to ten minutes. Each subject in this study was presented with a copy of the test sheet and was instructed to place a check mark beside the characteristic which best described his behavior.

Scoring was accomplished via reference to a scoring guide (Khatena & Torrance, 1976). Creative responses received a credit of one point. A total score of 50 was possible on WKOPAY pre- and posttest, creative perception index. Raw scores for the WKOPAY pre- and posttest were converted into standard scores for data analysis by using a score transformation guide in the Creative Perception Index Manual (Khatena & Torrance, 1976).

Procedure

The classes containing the individual subjects were randomly assigned into an experimental or control group. The experimental group participated in the WKOPAY pre- and posttest and 20 individual training activities. The control group also participated in the pre- and posttest but did not participate in the 20 individual training activities.

The 20 individual training activities included procedures designed to enhance creativity relative to inquiry, flexibility, questioning, critical thinking, attribute listing, morphological analysis, synectics,

applied imagination, fluency, originality, alternative outcomes, divergent production, and tolerance for ambiguity. These 20 activities are assumed by many professionals to be vital for the elimination of psychological blocks to creativity, to aid the enhancement of self perception, and to foster the development of experiences or products through which creativity is increased. The individual training activities may be found in Appendix A.

Upon entry into the experimental and control classes each subject was presented a printed paper which described the investigation and assured each subject the opportunity to participate or not to participate in the study. The subjects were assured of anonymity relative to future publications of the study, and were asked to sign a consent form if they chose to participate in the study. The consent form and a description of the investigation are provided in Appendix B.

A split plot factorial analysis of variance with repeated measures on the pre- and posttest factors was employed to determine if any significant differences existed relative to the experimental and control groups, pre- and posttests, three schools of concentration, and freshmen and senior males.

Chapter 3

RESULTS

This section of the manuscript will present and discuss each of the four research hypotheses. Each hypothesis will be discussed along with the results and analysis. A split plot factorial analysis of variance with repeated measures on the pre- and posttest factors was utilized to analyze the hypotheses.

Null Hypothesis One

There are no significant differences between freshmen and senior men as measured by WKOPAY pre- and posttest creative perception index scores. Analysis of the WKOPAY pre- and posttest scores relative to freshmen and senior men failed to yield significant differences $F(1,70) = .27, p > .25$. The means relative to pre- and posttests for freshmen and seniors respectively are illustrated in Table 2.

Table 2

WKOPAY Pre- and Posttest Means Relative
to Freshmen and Senior Men

Group	Pretest	Posttest	N
Freshmen	4.55	4.50	9
Seniors	4.46	4.85	27

Based on the previous analysis of variance the null hypothesis was not rejected and the alternative hypotheses: (1) freshmen male students will score significantly higher on the WKOPAY pre- and posttests than senior male students, and (2) senior male students will score significantly higher on the WKOPAY pre- and posttests than freshmen male students can not be accepted. In summary, freshmen did not exhibit a significantly higher level of creative perception than seniors.

Null Hypothesis Two

There are no significant differences between the subjects' fields of concentration (i.e., Education and Psychology, Applied Arts and Sciences, and Liberal Arts and Sciences) as measured by WKOPAY pre- and posttest scores. An analysis of variance was utilized to determine if there were any differences between pre- and posttest scores relative to the subjects' field of concentration (i.e., Education and Psychology, Applied Arts and Sciences, and Liberal Arts and Sciences). It was found there were no significant differences among the fields of concentration $F(2, 69) = .33, p > .25a$. Pretest means were 4.00, 4.47, and 4.40 for Education and Psychology, Applied Arts and Sciences, and Liberal Arts and Sciences respectively. Posttest means were 4.33, 4.47, and 4.40 for Education and Psychology, Applied Arts and Sciences, and Liberal Arts and Sciences respectively.

Therefore, the null hypothesis was not rejected and the alternative hypotheses: (1) the male subjects enrolled in the School of Education and Psychology will score significantly higher on the WKOPAY pre- and posttests than male subjects enrolled in the Schools of Applied Arts and Sciences and Liberal Arts and Sciences, (2) male subjects enrolled in the

School of Applied Arts and Sciences will score significantly higher on the WKOPAY pre- and posttests than male subjects enrolled in the Schools of Education and Psychology and Liberal Arts and Sciences, and (3) male subjects enrolled in the School of Liberal Arts and Sciences will score significantly higher on WKOPAY pre- and posttests than subjects enrolled in the Schools of Education and Psychology and Applied Arts and Sciences were not accepted. Thus, there are no significant differences in creative perceptiveness relative to the male students' fields of concentration.

Null Hypothesis Three

There are no significant differences between the experimental and control groups as measured by the WKOPAY pre- and posttest scores. Comparisons of the experimental and control groups relative to WKOPAY pre- and posttest means failed to yield a significant difference between the two groups [$F(1,34) = 3.41, p > .05$] as illustrated in Tables 3 and 4.

Table 3

Experimental and Control Group Means Relative
to WKOPAY Pre- and Posttests

Group	Pretest	Posttest	N
Experimental	4.47	4.82	17
Control	4.15	4.21	19

Thus, the null hypothesis was not rejected and the alternative hypothesis: The experimental group will score significantly higher on WKOPAY pre- and posttests than the experimental groups is not accepted. The alternative hypothesis: The control group will score significantly

Table 4

ANOVA Relative to the Experimental and
Control Groups WKOPAY Posttest Scores

Source of Variation	DF	Sum of Squares	Mean Squares	F
Between Groups	1	3.37	3.37	3.41
Within Groups	34	33.63	.99	
Total	35	37.00		

higher than the experimental group on the WKOPAY pre- and posttests is not accepted. In summary, the experimental group did not exhibit a significantly higher level of creative perceptiveness than the control group.

Null Hypothesis Four

There are no significant differences between WKOPAY pre- and posttests for the entire group of 36 male students. Comparisons of WKOPAY pre- and posttest scores for the entire group of 36 male students failed to yield significant differences, $F(1, 70) = .46$, $p < .25$. The pre- and posttest means were 4.31 and 4.47 respectively.

Thus, the null hypothesis was not rejected and the alternative hypotheses: (1) the entire group of 36 male subjects will score significantly higher on the WKOPAY posttest than the pretest, and (2) the entire group of 36 male subjects will score significantly higher on the WKOPAY posttest than the pretest are not accepted. Therefore, the entire group of 36 male subjects did not exhibit a significant increase in creative perceptiveness between WKOPAY pre- and posttests.

Summary of Results

An analysis of variance supported the null hypothesis: There are no significant differences between freshmen and seniors WKOPAY pre- and posttest scores. It was concluded that there were no significant differences in creative perception relative to the preceding groups as indicated by a non-significant F ratio.

An analysis of variance supported the null hypothesis: There are no significant differences relative to the male student's field of concentration (Education and Psychology, Applied Arts and Sciences, and Liberal Arts and Sciences) as measured by WKOPAY pre- and posttest scores. This is apparent due to the non-significant F ratio. Thus, it was concluded that there were no differences in creative perception relative to the male subjects fields of concentration.

Comparisons of experimental and control groups' WKOPAY pre- and posttest scores lent support to the null hypothesis: There are no significant differences between the experimental and control groups as measured by WKOPAY posttest scores. This is apparent due to the non-significant F ratio, and it is concluded the experimental group did not exhibit a higher level of creative perceptiveness than the control group.

An ANOVA was utilized to compare WKOPAY pre- and posttest scores for the entire group of 36 males. A non-significant F ratio supported the null hypothesis: There are no significant differences between the pre- and posttests. Thus, there were no differences in the males' creative perceptions relative to WKOPAY pre- and posttests.

Chapter 4

DISCUSSION AND SUMMARY

This section of the manuscript was provided to summarize and restate the rationale, methodology, discussion of the results, and implications of this study along with suggestions for further research.

Rationale

This thesis presented a variety of definitions, theoretical models, and assessment instruments relative to creativity. This experimenter has attempted to measure and analyze the perceived level of creativity of university freshmen and senior males, and to determine if experimental training had an effect on perceived levels of creativity. Another objective of this study was to determine if there were any differences in creative perceptiveness relative to the subjects' field of concentration: Education and Psychology, Applied Arts and Sciences, and Liberal Arts and Sciences.

The null hypotheses of this study were as follows:

1. There are no significant differences in the creative perceptions of freshmen and senior men as measured by WKOPAY pre- and posttest creative perception index scores.

2. There are no significant differences in the creative perceptions of the male subjects relative to their field of concentration, Education and Psychology, Applied Arts and Sciences, and Liberal Arts and Sciences as measured by WKOPAY pre- and posttest scores.

3. There are no significant differences in creative perceptiveness relative to the experimental and control groups as measured by WKOPAY creative perception index posttest scores.

4. There are no significant differences between WKOPAY pre- and posttest creative perception index scores of the entire group of 36 subjects.

Methodology

A total of 69 male university students participated in the study. Of these 69 subjects 36 completed the WKOPAY pre- and posttests. Thus the subjects who completed both the pre- and posttest were utilized for data analysis. The classes containing the freshmen and senior males were randomly assigned to either an experimental or control group. The experimental group and control group were similar in that they both participated in the WKOPAY pre- and posttests. They were different in that the experimental group participated in 20 individual training activities while the control group did not participate in the exercises.

Discussion of Results

It appears that the preceding results are consistent with Daniels' (1981) findings that social and university pressures have inhibited freshmen and senior male college students' creative perceptions. This is supported by the non-significant differences relative to WKOPAY pre- and posttests for the entire group of 36 subjects, the three fields of concentration, and freshmen and senior males. It is indeed possible that more extensive and prolonged training would have increased the scores significantly.

It also appears that training may foster creative perceptiveness to some degree as evidenced by the higher posttest scores of the experimental group relative to the control group. However, the difference between the two groups was not statistically significant, and support for the training methodology in this study should be substantiated by further research.

Suggestions for Future Research and Implications

The SAM and WKOPAY inventories, as mentioned in the assessment instrument section of the manuscript, have different types of items. It is possible that the forced-choice item format of the WKOPAY may have placed some pressure and anxiety on the original 69 subjects as only 36 of them completed both the pre- and posttests. In the Daniels' study, in which the SAM was utilized, all 69 subjects completed both the pre- and posttests. However, at this point, any proposition in reference to forced-choice items and the pressure they exert on subjects is unsubstantiated until further research is done. Future studies of a similar nature may also benefit if they attempt to utilize the same time of training activities as provided in this study. As was mentioned earlier, it may be advisable for these activities to be more prolonged and extensive in nature so as to produce a significant change in individuals' self perceptions of creativity.

Creativity is a multifaceted and complex entity. No one theory or definition can describe or explain it. No one training procedure is superior in fostering creativity. Many professionals such as Torrance, Khatena, Gowan, and Parnes stress that training should include the

utilization of a variety of techniques such as synectics analogy, brainstorming, and synthesis. A positive environment which rewards originality should be provided, and blocks to creativity such as old unproductive problem solving habits, over emphasis on conformity to popular beliefs and attitudes, should be lessened or eliminated. Courage, independence, curiosity, resourcefulness, and risk-taking should be rewarded and encouraged.

Creativity has unlimited growth and potential. Many of our nation's problems might some day be solved by creative and unconventional means. New technology may develop from the world's creative minds. An obvious example is the rise of the computer and the vast number of applications it has provided for science, industry, and education.

Education surely must no longer neglect the development of creative thinking and behavior. In today's complex and stressful society original thinking may be necessary for survival. The phrase, "There is more than one way to skin a cat," still holds true.

REFERENCE NOTE

REFERENCE NOTE

1. McCannel, T. R. The rediscovery of the gifted student. Paper presented at the Pacific Northwest Conference on Higher Education, Southern Oregon College, July 1959.
2. Daniels, R. Perceived and behavioral levels of creativity for university women. Unpublished doctoral dissertation, University of Nebraska, 1980.

REFERENCES

REFERENCES

- Backman, M. E., & Tuckman, B. W. Review of the RAT highschool form. Journal of Educational Measurement, 1972, 9(2), 161-162.
- Baird, L. L. In O. K. Buros, The seventh mental measurements yearbook. Highland Park, New Jersey: The Gryphon Press, 1972.
- Bledsoe, J. C., & Khatena, J. Factor analytic study of the test, something about myself. Psychological Reports, 1973, 32, 1176-1178.
- Clark, L. In O. K. Buros, The seventh mental measurements yearbook. Highland Park, New Jersey: The Gryphon Press, 1972.
- Cunnington, B. F., & Torrance, E. P. Sounds and images. Boston: Ginn & Co., 1965.
- Daniels, R. Perceived and behavioral levels of creativity for university women. Unpublished doctoral dissertation, University of Nebraska, 1980.
- Daniels, R. The investigation of perceived levels of creativity for college men. Journal for the Education of the gifted, 1981, IV(4), 255-260.
- Davis, G. A. In frumious pursuit of the creative person. Journal of Creative Behavior, 1975, 9(2), 75-87.
- Davis, G. A., & Belcher, T. L. How shall creativity be measured? Torrance's tests RAT, Alpha Biographical, and IQ. Journal of Creative Behavior, 1971, 5(3), 153-161.
- Gordon, R. Death and creativity: A jungion approach. Journal of Analytical Psychology, 1977, 22(2), 106-124.
- Gowan, J. C. Development of the creative individual. San Diego: Robert R. Knopp, 1972.
- Gowan, J. C., Khatena, J., & Torrance, E. P. Educating the ablest. Itasca, Illinois: F. E. Peacock Publishers Inc., 1977.
- Guilford, J. P. Nature of human intelligence. New York: McGraw-Hill, 1967.
- Guilford, J. P. Some misconceptions regarding the measurement of creative talents. Journal of Creative Behavior, 1971, 5(2), 77-87.
- Heist, P. (Ed.). The creative college student: An unmet challenge. San Francisco: Jossey-Bass Inc., 1968.

- Hoepfner R. Review: The Torrance tests of creative thinking. Journal of Educational Measurement, 1967, 67(4)(3), 191-192.
- Joesting, J., & Joesting, R. Some correlations of what kind of a person are you? A test of creativity. Psychological Reports, 1978, 32, 1137-1138.
- Khatena, J. Onomatopoeia and images: Preliminary validity study of a test of originality. Perceptual and Motor Skills, 1969, 28, 335-338.
- Khatena, J. Something about myself: A brief screening device for identifying creatively gifted children and adults. Gifted Child Quarterly, 1971, 15, 262-280.
- Khatena, J. Facilitating the creative functions of the gifted. Gifted Child Quarterly, Summer 1977, 21-22, 220-226.
- Khatena, J. The Khatena-Torrance creative perception inventory for identification diagnosis facilitation and research. Gifted Child Quarterly, 1977, (4), 517-525.
- Khatena, J. The creatively gifted child: Suggestions for parents and teachers. New York: Vantage Press, 1978.
- Khatena, J., & Torrance, E. P. Manual for the Khatena-Torrance creative perception inventory. Chicago, Illinois: Stoelfing, 1976.
- Mednick, S. A. The associative basis of the creative process. Psychological Review, 1962, 69(3), 220-232.
- Nydes, J. Creativity and psychotherapy. Psychoanalytic Review, 1962, 49, 29-33.
- Parnes, S. J. Cpsi: The general system. Journal of Creative Behavior, 1977, 1(11), 1-10.
- Rekdal, C. K. In search of the wild duck: Personality inventories as tests of creative potential, and their use as measurements in programs for the gifted. Gifted Child Quarterly, 1977, 21(4), 501-516.
- Rimm, S., & Davis, G. A. Gift: An instrument for the identification of creativity. Journal of Creative Behavior, 1976, 10, 178-182.
- Roweton, W. E. Creativity: A review of theory and research. Madison, Wisconsin: Wisconsin University, 1970. (ERIC Document Reproduction Service No. ED 044 012)
- Taylor, Sutton, & Haworth. The measurement of creative transactualization: A scale to measure behavioral dispositions and creativity. Journal of Creative Behavior, 1974, 8(2), 114-115.
- Torrance, E. P. Encouraging creativity in the classroom. Dubuque, Iowa: Wm. C. Brown Co. Publishers, 1970.

Torrance, E. P. Torrance tests of creative thinking: Norms technical manual. Princeton, New Jersey: Personal Press, 1974.

Welsh, G. S. Perspectives in the study of creativity. Journal of Creative Behavior, 1973, 7(4), 231-246.

APPENDIX A

Subject's Name	Age	Sex	Grade
School	Date	Scorer	

WHAT KIND OF PERSON ARE YOU?

Below is a list of characteristics frequently used in talking about people. Indicate by placing a check mark (✓) beside a or b of your test sheet the one term of each pair that best describes you. Remember, even if neither term describes you exactly, select the one term of each pair which is nearest to being a description of yourself.

- | | |
|--|--|
| 1. <u> </u> a. Likes to work alone | 14. <u> </u> a. Attempts difficult tasks |
| <u> </u> b. Prefers to work in a group | <u> </u> b. Desires to excel |
| 2. <u> </u> a. Industrious | 15. <u> </u> a. Disturbs existing organization and procedures |
| <u> </u> b. Neat and orderly | <u> </u> b. Accepts the judgment of authorities |
| 3. <u> </u> a. Socially well-adjusted | 16. <u> </u> a. A good guesser |
| <u> </u> b. Occasionally regresses and is playful and childlike | <u> </u> b. Remembers well |
| 4. <u> </u> a. Persistent | 17. <u> </u> a. Quiet |
| <u> </u> b. Does work on time | <u> </u> b. Obedient |
| 5. <u> </u> a. Popular, well-liked | 18. <u> </u> a. Independent in judgment |
| <u> </u> b. Truthful even if it gets you in trouble | <u> </u> b. Considerate of others |
| 6. <u> </u> a. Considerate of others | 19. <u> </u> a. Critical of others |
| <u> </u> b. Courageous in convictions | <u> </u> b. Courteous, polite |
| 7. <u> </u> a. Conforming | 20. <u> </u> a. Feels strong emotions |
| <u> </u> b. Nonconforming | <u> </u> b. Reserved |
| 8. <u> </u> a. Sophisticated | 21. <u> </u> a. Emotionally sensitive |
| <u> </u> b. Unsophisticated | <u> </u> b. Socially well-adjusted |
| 9. <u> </u> a. Sense of humor | 22. <u> </u> a. Imaginative |
| <u> </u> b. Talkative | <u> </u> b. Critical |
| 10. <u> </u> a. Visionary | 23. <u> </u> a. Receptive to ideas of others |
| <u> </u> b. Versatile | <u> </u> b. Negativistic |
| 11. <u> </u> a. Adventurous | 24. <u> </u> a. Fault-finding |
| <u> </u> b. Does work on time | <u> </u> b. Popular, well-liked |
| 12. <u> </u> a. Becomes absorbed in tasks | 25. <u> </u> a. Determined |
| <u> </u> b. Courteous, polite | <u> </u> b. Obedient |
| 13. <u> </u> a. Curious | 26. <u> </u> a. Intuitive |
| <u> </u> b. Energetic | <u> </u> b. Thorough |

27. __a. Never bored
__b. Refined
28. __a. Haughty
__b. Courteous
29. __a. Cautious
__b. Willing to take risks
30. __a. Affectionate, loving
__b. Courteous, polite
31. __a. Always asking questions
__b. Quiet
32. __a. Competitive
__b. Conforming
33. __a. Energetic
__b. Neat and orderly
34. __a. Remembers well
__b. Talkative
35. __a. Self-assertive
__b. Reserved
36. __a. Sense of beauty
__b. Socially well-adjusted
37. __a. Self-confident
__b. Timid
38. __a. Versatile
__b. Popular, well-liked
39. __a. Self-sufficient
__b. Curious
40. __a. Thorough
__b. Does work on time
41. __a. Eccentric
__b. Socially well-adjusted
42. __a. Self-confident
__b. Spirited in disagreement
43. __a. Spirited in disagreement
__b. Talkative
44. __a. Prefers complex tasks
__b. Does work on time
45. __a. A good guesser
__b. Receptive to ideas of others
46. __a. Curious
__b. Self-confident
47. __a. A self-starter
__b. Obedient
48. __a. Intuitive
__b. Remembers well
49. __a. Unwilling to accept things
on mere say so
__b. Obedient
50. __a. Altruistic, working for
the good of others
__b. Courteous, polite

EMPORIA STATE UNIVERSITY

You are invited to participate in a study of creativity as it relates directly to you. I hope to learn how creative you believe yourself to be, and if training or task activities increase the amount of creativeness you believe you possess. You were selected as a possible participant in this study because you were a member of a particular English, Speech, or Psychology class which I have elected to utilize because of their relationship to the field of education.

Should you decide to assist me in this study of creativity with University freshmen and seniors, I will plan to spend two class periods with you, approximately 50 minutes each session (within a two-week span of time); a ten-minute pre- and posttest will be administered at the beginning of the first session and at the end of the second session. The pre- and posttest (the inventory checklist) will result in a score (or an index) of your perceived level of creativity. There are no right or wrong answers, just a personal assessment. Only I will see these individual scores and they will be identified only by your identification number so that I may compare pre- and posttest scores. The information will remain confidential. I do not perceive this test inventory to be anxiety producing in any way. However, if the inventory bothers you, please feel free to talk with me about it. In any event, you are free to withdraw from the experiment at any time. A series of activities or tasks related to creativity and the inventory will follow. These activities or tasks are intended to be enjoyable, to help free a pattern of thinking, and non-threatening to you. I will be demonstrating a variety of activities and tasks and will request that the group participate as they feel they can. Your responsibility as an individual will entail an attempt to produce a particular activity or task after I have demonstrated it. (These individual activities will not be presented to the class, but rather will be turned over to me with your identification number, so that I may make comparisons between the tasks and the inventory score. The information will remain confidential.) At the end of the second session a posttest (a repeat of the pretest) will be administered.

I will be comparing pre- and posttest scores along with results of task activities. I hope to determine the influence of activities and tasks upon the creativity inventory scores. The results of the study I will make available to you through your subject area professors, or you may contact me directly.

I do not envision any personal discomfort or risk involved for you and there will be no financial cost to you. I hope that you might envision yourself as a more creative person after the experiment. I cannot or do not guarantee or promise that you will in fact receive any benefits from this study. You will, however, have my deepest level of appreciation for cooperating.

If you give me your permission by signing this document, I plan to disclose information to Emporia State University as part of the requirement for a M.S. The information will be summarized as to a group of freshmen or seniors (not individuals) and will depict differences between freshmen, between freshmen and seniors, and between seniors relative to scores on the inventory and task activities. The purpose being to ascertain if the objectives of the study have been met relative to my dissertation.

Your decision whether or not to participate will not prejudice your future relations with Emporia State university. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without prejudice.

If you have any questions, please feel free to ask me. I also may be reached by telephone in the Psychology Department 343-1200 ext. 317

You will be given a copy of this form to keep.

YOU ARE MAKING A DECISION WHETHER OR NOT TO PARTICIPATE. YOUR SIGNATURE INDICATES THAT YOU HAVE DECIDED TO PARTICIPATE HAVING READ THE INFORMATION PROVIDED ABOVE.

Date

Signature

Witness

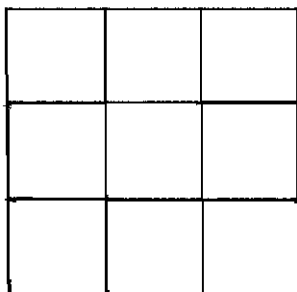
Steve M. Grady

Investigator

APPENDIX B

The following diversified activities were selected as perception stimulators for creativity because they represented various strategies as noted in the previous section. The various activities are in a varied order of difficulty to provide more variety to the training sessions.

1. How many different squares do you see in the diagram?



2. Divide '8' into two equal halves.
3. Complete the following three numbers in the series that follows:
 1, 1, 2, 3, 5, 8, 13, 21, 34, ____, ____, ____, ____
4. I wish to construct a building which provides southern exposure on each of the four sides. I have been told to forget the idea. Can you think of an idea for such a location on this planet?
5. What unusual characteristics do these words have in common?
 deface sighting calmness unopened stunt
6. Rhyme and reason. After each "definition," note two rhyming words to which it refers.

For example: TV...boob tube
 Large hog...big pig

Now do these: Happy Father
 Weak Man
 Criticism lacking in effectiveness
 Highest ranking policeman
 Mature Complaint
 False Pain
 Clever Beginning

7. Find the general rule that dictates this series of numbers:

18, 11, 15, 14, 19, 16, 13, 12, 20

8. You have just learned about the first test of the semester. How many ways can you think of to prepare for taking the test?

9. How many ways are university like the high school you attended?

10. How might we solve the problem of students cheating?

How can present students help with solutions?

How can former students help with solutions?

How is cheating like winning?

How is cheating like losing?

11. Suppose you could select the student governing board? What would happen if you could select the student governing board?

changes, continue the same, combinations, start new, or create for examples.

12. Someone created the paper clip for a very useful purpose. How might we change the paper clip according to the following new idea checklist?

Put to other uses

Adapt

Modify

Magnify

Minify

Substitute

Rearrange

Reverse

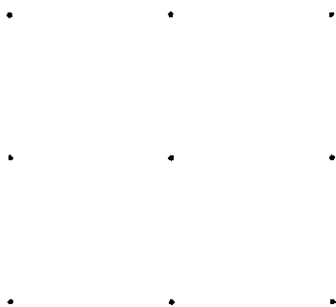
Combine

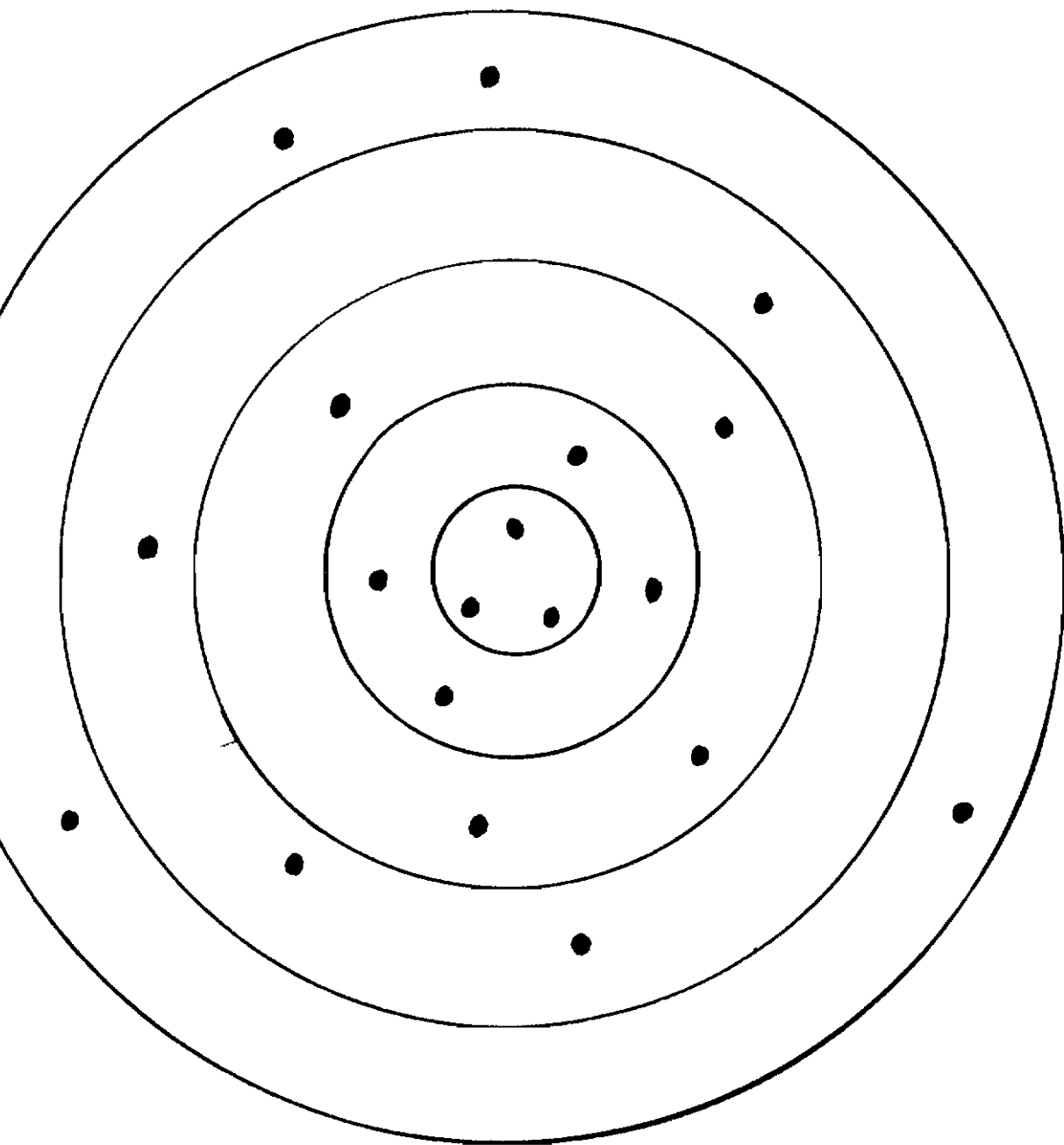
13. Take an original art object and find as many alternative uses, adaptations, or substitutions, etc. as possible.

Substitute
Combine
Adapt
Modify, magnify, minify
Put to other uses
Eliminate
Reverse

14. Use two straight lines and separate all dots leaving each dot in its own private compartment.

15. Draw four (4) straight lines that go through all nine (9) dots, but through each dot only once. You should not lift the pencil from the paper after you begin drawing the four lines.





16. Use three lines to connect the four dots. The lines must be ruler straight and must enclose the asterisk.



17. While walking through a park, I met two mothers who were with their two daughters. They were friends of long standing, so I stopped and visited with them for a while. As a departing gesture, I gave them three large red apples that I had with me. When they divided the three apples among themselves, each had a whole apple. How was this possible?
18. The board of education of a certain school district consists of five members: they are Mrs. Slater, Mrs. Johnson, Dr. Brooks, Mrs. Pierce, and Mr. Turner. At their first meeting they were assembled at a round table in the above order. They decided to elect a chairman. The first ballot was a standoff; each member had either voted for his neighbor or himself. The second time around they stuck to their original choices, except for Dr. Brooks, who then voted for Mr. Turner. Thus Mr. Turner became chairman. Who voted for Mrs. Johnson the first ballot?

19. Mr. and Mrs. Smith, Mr. and Mrs. Brown, and Mr. and Mrs. Green are seated equally spaced around a circular table. No man is sitting next to his wife, but each lady has a man on each side of her. The names of the men and their wives, not necessarily respectively are: Tom, Dick, Harry, Nancy, Joan, and Mary. The occupations of the men, again not respectively are: architect, politician, and machine operator.

Dick and Mrs. Smith often play bridge with the architect's wife and Mrs. Green.

The machine operator, who is an only child, has Mary on his right. The politician is sitting nearer to Nancy than he is to Mrs. Brown.

Harry is the architect's brother-in-law, and he has his only sister sitting on his left.

The architect is sisterless.

Find their names, their occupations, and the order in which they are sitting around the table.

20. Clark, Jane, Louie, Marie, and Ossie are freshman, sophomore, junior, senior, and graduate students in dentistry, education, medicine, ministry, and law, but not respectively. The following facts are known:

Ossie was graduated from law school last year with honors.

The education student graduated from the same high school as Clark and Louie.

Jane will become an intern next year.

Marie is in a higher class than Clark.

Clark and the sophomore ministry student room together.

Pair off the students according to profession and class in school.