CREATIVITY LEVELS AND PERCEIVED FAMILY TYPE OF INTERIOR DESIGN AND HOTEL AND RESTAURANT ADMINISTRATION UNDERGRADUATES

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Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF PHILOSOPHY
July, 1989

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ACKNOWLEDGMENTS

The completion of this dissertation and resulting doctorate was possible with the aid of many individuals. I would like to thank Dr. Margaret Weber for her guidance. I would like to express my appreciation to Dr. James Moran, III, for the insightful comments and helpful sessions when I dropped by with data problems. I would like to acknowledge Dr. Kay Bull for his expertise in and role model for creativity research. I would like to thank Dr. Esther Winterfeldt for her continued suggestions and support even after she moved.

I would like to thank and acknowledge Dr. Charles Gardner, Jr. for the professional attitude and utmost integrity with which he conducts his life. He has been my role model and mentor.

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CHAPTER I

INTRODUCTION

The need for the most creative minds is becoming increasingly important in this country as competition in the highly technical and intellectual professions becomes more pronounced with each year. It is the creative process in humans that is the key to success or failure in the quest for knowledge in man's journey beyond the bounds of the sure and known and in his exploration of the unknown (Barron, 1968). In the past, our forefathers were forced to practice creativity because of their circumstances. They had to force their minds and muscles to the utmost or fail and had to think up new ways to solve new problems. "Their creative instincts were sharpened on the stones of adversity" (Osborn, 1965, p. 59). It seems in the information processing age in which we find ourselves today, a need for highly creative people to arrive at solutions for tomorrow is at least as vital as yesteryear. This problem solving process will be experienced by those young people who are in the educational system today.

Past and present research indicates differing but contributing views to the concept of creativity. The term 'creativity' presents a challenge today, shown by the numerous definitions. It has only been in the last third of a century that any intensive attempts have been made to understand the complexity of the creative process.

With awareness training and exercising of the creative process via workshops, seminars and classes, such as in interior design, it would seem that creativity can increase over time. According to some, it is believed that creativity can be taught (Torrance & Torrance, 1973; Parnes, 1962). While believing that creative thinking can be taught, it is also important to understand possible patterns in human characteristics that may lead to or help predetermine creative ability.

It is necessary to consider the creative process and to assess personality characteristics, birth position within the family, sex and parental occupations of creative individuals. The family unit is also vital and is expressed through the creative individual's perceptions of his/her family's adaptability and cohesiveness. Through self report, it is found that creative people possess certain attitudes and personality patterns that predispose them to act creatively (Davis, Peterson & Farley, 1974). Creative

adolescents believe they are independent, uninhibited, creative (Schaefer, 1969), individualistic, enthusiastic, eager to explore, serious, and rational (Domino, 1970). Creative undergraduates also tend to have a high tolerance for ambiguity and express impulsive urges (Phillips, 1973). High creatives also score high in emotional and intellectual over-excitability (Schiever, 1985). It is believed students with these personality traits experience and respond to their environment with greater intensity (Schiever, 1985). Creative people break away from old familiar patterns, find alternatives and converge on new solutions. They innovate and aim toward newness (Young, 1985). The ability to see patterns and to sense problems are characteristics usually included in creativity. It is the ability to "know when you don't know" (Taylor & Holland, 1964, p. 21) that may be crucial to making original contributions.

When considering school majors in the level of creativity, studies show differing creativity levels among engineering and scientific professionals (Gough, 1976). Business majors tend to have low levels of creativity while students in architecture have high creativity levels (Bergum & Cooper, 1977). Other research indicates there is no evidence of creativity being linked to a particular college major (Daniels,

Heath & Reed, 1983). There seems to be a need for additional research in the area of college major.

When looking at parental occupation in its role toward the child's high creativity level, it is found that having a father in a high level occupation (Dewing & Taft, 1973) with high autonomy scores (Weisburg & Springer, 1967) is important. When considering maternal employment, research shows opposing findings where creative children do have a mother employed outside the home (Asha, 1983) as well as one who is not presently employed outside the home (Lunneborg & Lunneborg, 1969).

When considering birth position within a family, some research suggests both firstborns (Clark & Rice, 1982) and later borns (Farley, 1978) are the most creative. Other research finds no statistical significance in family size when measuring achievement levels (Cicirelli, 1967). Again, research does not seem to be conclusive. When considering sex, it is found that the later born female and firstborn male tend to be more creative than their siblings (Eisenman, 1967a, Eisenman, 1968b). Other research finds no creativity differences in firstborn versus later born among females (Eisenman & Schussel, 1970). It is indicated that sex and birth position are closely correlated.

As one looks at the family environment, it is found that the family of highly creative individuals is one where divergence is permitted and risks are accepted (Getzels & Jackson, 1967). Sometimes, however, creativity and contentment are not compatible within the family (Goertzel, Goertzel & Goertzel, 1978). Also, those children with creative potential describe their parents as 'rejecting' (Siegelman, 1973). On the other hand, those with 'permissive' mothers score higher on creativity tests (Parish & Eads, 1977).

It is interesting to note that research shows a dichotomy in scores. This may be due to the difference in the operational definitions used for creativity. The creative student is seen both as aloof and active; enthusiastic and reserved; and sensitive and tactless (Domino, 1970). The creative person apparently recognizes these opposing forces, such as impulsive and reflective, and is able to integrate them into his or her personality (Schaefer, 1969).

Statement of the Problem

As seen in the discussion, data has been collected on the socio-demographic status and personality characteristics of creative individuals. Research has also been conducted in various fields to determine creativity levels and personality traits. It is

important to know the personality characteristics of the creative individual, but what enhances the creative process is deemed more critical. It is here that the home environment becomes a significant and critical contributor to the development of the individual. There appears to be a need for more fully understanding the creative individual and his or her perception of the home environment and sense of family adaptability and cohesiveness. The present evolution through which the family unit appears to be going makes it important to address the issue of perceived family adaptability and cohesiveness. The healthy development of creative individuals will have a significant impact on future decisions made in the world. It is upon the premise of perceived family adaptability and family cohesiveness that this creativity study is based.

Purpose of the Study

The purpose of this study is to look at high, medium and low creativity levels among the respondents and to assess their perceived degree of family adaptability and cohesion. Among the goals of determining roles of school major, sex and parental occupations in one's creativity level is also to assess the degree of adaptability and cohesion a highly creative person perceives he has in his family

environment. To understand more fully the creative mind and process, two different groups of undergraduate students were chosen for this study. One group was in a traditionally artistic plan of study while the other group was in a management/business plan of study.

The study was conducted using freshmen and sophomore interior design students in interior design classes (HIDCS 1123, HIDCS 2223 and HIDCS 2313) in the College of Home Economics and freshmen and sophomore hotel and restaurant administration students in a class (HRAD 1102) in the College of Home Economics. It is believed that at the freshman and sophomore level, the student has not yet been exposed to purposeful teaching and training of creativity and is also not yet fully into his or her particular academic major program which may either accentuate or de-emphasize the creative process. It is also thought the undergraduate who is away from home will have a more objective perception of his family interrelationships as he is not presently under the influence or pressure of a family structure. To discover patterns of a personality profile of the highly creative person, his college major, parental occupations, birth position, sex and perceived family adaptability and cohesion are also assessed.

Objectives of the Study

The following objectives which guide the study include:

1. to compare the socio-demographic factor of school major in relation to creativity levels among freshman and sophomore interior design students and freshman and sophomore hotel and restaurant administration students in the College of Home Economics at Oklahoma State University.
2. to contrast the socio-demographic factor of parental occupations in relation to creativity levels among freshman and sophomore students in the College of Home Economics at Oklahoma State University.
3. to determine the socio-demographic factor of birth position within the family structure in relation to creativity levels among freshman and sophomore students in the College of Home Economics at Oklahoma State University.
4. to assess the socio-demographic factor of sex of respondent in relation to creativity levels among freshman and sophomore interior design students and freshman and sophomore hotel and restaurant administration students in the College of Home Economics at Oklahoma State

University.

5. to determine respondent's perceived family adaptability and cohesion in relation to creativity levels among freshman and sophomore students in the College of Home Economics at Oklahoma State University.

Definitions

For purposes of this study, relevant terms are defined as follows:

Creative Person refers to "possessing qualities of flexibility, initiative, perceptiveness,...high self esteem...high energy level" (Dohr, 1982, p. 25); "originality, adaptiveness" (MacKinnon, 1967, p. 228); "openness, growing" (Kollen, 1984, p. 4).

Family Adaptability refers to the ability of a marital/family or relationship system "to change its power structure, role relationships and relationship rules in response to a situational or developmental stress" (Russell, & Olson, 1983, p. 26; Olson, Sprenkle, & Russell, 1979, p. 12).

Family Cohesion refers to "the degree of emotional bonding family members have toward one another" (Olson, Russell, & Sprenkle, 1983, p. 70; Olson, Sprenkle, & Russell, 1979, p. 5).

Moderate Family refers to a balanced family as shown by the adaptability and cohesion score lying within the central four areas of the circumplex model; (according to the Family Adaptability and Cohesion Evaluation Scales, Olson, Portner, & Lavee, 1985); these are characterized by "Flexibly Separated", "Flexibly Connected", "Structurally Separated" and "Structurally Connected". Families in this area are high functioning because they are able to handle situational and developmental crises successfully (Russell, 1979).

Assumptions

The scope of research is conducted with the following assumptions considered:

1. Each respondent will respond to questions as accurately and honestly as he or she can;
2. The respondents in this study are representative of interior design students and hotel and restaurant administration students in the College of Home Economics at Oklahoma State University.

Limitations

It is understood that the following limitations affect the generalizability of the research. They include:

1. The study is limited to freshman and sophomore students in the College of Home Economics at Oklahoma State University;
2. The operational definitions of creativity and family types do not represent all the definitions of creativity that exist and have been used in research and are not intended to be all inclusive.

CHAPTER II

REVIEW OF LITERATURE

For the last several decades, researchers have attempted to define the term 'creativity'. It is recognized that creativity occurs at almost all ages, in some aspects of all cultures and even to some degree in all fields of endeavor. This chapter will be looking at socio-demographic variables such as birth position and sex of the creative subject within his or her family and the role these variables play in the level of creativity. It will also assess the contribution of the person's college major as well as the influence of parents' occupations as contributing factors to the level of creativity in the student. Another factor includes the creative person's self report of his or her own perceptions toward the sense of cohesion and adaptability within the family. The purpose of this study is to look for any differences of statistical significance in the population of responding freshman and sophomore college students in levels of creativity when considering the variables just listed.

Starting with the research surge in the 1950's, a popular question has been, "What is the relationship between creativity and intelligence?" It is believed by some researchers (Guilford & Christensen, 1973) that creative potential is an important part of intelligence. Others conclude original thinking is distinct from intelligence (Moore & Sawyers, 1987), the interaction of I. Q. and fluency is not significantly related to creative performance (Runco, 1986) and that genius is not positively related to high I. Q. (Ehrenwald, 1984). For purposes of this study, it will be assumed there is some moderate correlation (Guilford, 1967) and a differentiation (Weisburg & Springer, 1967) between both creativity and intelligence. There is also some correlation between birth order and intelligence (Zajonc & Markus, 1975; Zajonc, 1976). The focus in this study will be, specifically, creativity.

Much literature expresses various traits of creativity. It is believed that creative people can be self-starting, uncourteous, childish, playful, negativistic or emotional (Torrance, 1963). They are also somewhat stodgy (Hogan & Weiss, 1974) and not necessarily the most original (Torrance, 1969).

According to some literature, it is suggested a generalized disposition exists to distribute one's creative efforts across various areas such as fine arts,

crafts, performing arts, math-science, literature and music. Certain attitudes, motivations, interests and values "predispose a person to think and behave more creatively" (Davis, 1975, p. 77). There seems to be a continuum of people ranging from "highly creative individuals who pursue excellence in a variety of ways to noncreative individuals who perhaps lack the ability or motivation" (Hocevar, 1976, p. 870). Creative aptitude may be the same irrespective of the discipline in which it is exhibited (Mednick, 1963) as many creative individuals "have evolved effective personal strategies for generating ideas" (Davis & O'Sullivan, 1980, p. 157). On the other hand, others believe (Hocevar, 1979) a person who is creative in one area has neither the time, ability, nor the motivation to be creative in other areas. Individuals have different creative aptitudes in different disciplines (Guilford, 1967).

Other research suggests the ability to express creativity does not seem related to experience while technical competence gradually increases with age (Trowbridge & Charles, 1966). The expression of creative needs may lead to loneliness, conflicts and alienation. The creative individual is, after all, a minority of one when a new idea is thought of which could also lead to few anchors in reality (Schiever,

1985). It seems independence appears to be a personality disposition for creative performance, (Albert & Runco, 1986). The creative person, in general, lives with great intensity, is strongly devoted to an idea or cause (Torrance, 1963), is sensitive to deficiencies (Torrance, 1959) and can pose problems as well as simply solve problems (Smilansky & Halberstadt, 1986).

Self Report of Personality Traits

Much research has been conducted on creative individuals by having them select self-describing adjectives. It is found that these self reports show a dichotomy in results. The creative student sees himself as both "active and aloof, enthusiastic and reserved, humorous and serious, sensitive and tactless, rational and unconventional" (Domino, 1970, p. 50). These adjectives suggest creative people not only recognize opposing forces in their nature but are able to integrate them into his or her personality as he or she possesses an "exceptionally strong" ego (Schaefer, 1969, p. 239).

One study shows (Schaefer, 1969) creative adolescents see themselves as creative, independent and uninhibited while those adolescents in the creative writing and art fields exhibit impulsivity, craving for

novelty, autonomy, have a stable self-concept and are able to reconcile the opposing forces in their nature (Schaefer, 1973). Creative people tend to possess certain attitudes and personality patterns. Studies of the creative person (Davis, Peterson & Farley, 1974), show much independence, self confidence, enthusiasm, energy, curiosity, sense of humor, risk taking, preference for complexity and originality. It is believed (Domino, 1970) the creative person is individualistic in a constructive manner and his or her enthusiasm and spirit of adventure are well utilized. He or she does experience emotional turmoil, is quick to act, is serious, rational and mature. As an inventor, (Rossman, 1964) one must believe in one's own ability to eventually overcome difficulty.

According to a study which looks at the moral ethical self it is shown those scoring as high creatives have a higher moral ethical self concept than those who score as low creatives (Whiteside, 1977). Other characteristics found to be related to creativity (Phillips, 1973) include the tendency to examine one's motives, enjoy poetry, paintings, architecture and to have more liberal views about the existence of God. Low scores on the same dimensions of creativity reflect a "dislike for philosophical or serious books;...lack of interest in the fine arts or artistic things; a need for

structure and controlled guidance;...unshakeable belief in God; and a lack of responsibility" (Phillips, 1973, p. 28).

In another study (MacKinnon, 1965), it is shown that among three groups of creative architects, Group III respondents, who are ranked the least creative, describe themselves most frequently to be "conscientious". Group II respondents, who are in the middle range of creativity, describe themselves most frequently to be "civilized", while the adjective selected most often by the most creative, Group I respondents, is "imaginative". In another study of architecture students (Gilchrist, 1982), one finds the high creatives to be more unconventional, sensitive, emotional, prefer perceptually complex stimulus patterns and have a tendency to become absorbed in emotional experiences such as those aroused by art and music.

In summary, according to the research, there is a dichotomy in adjectives self-selected by creative individuals. Creative people report themselves to be enthusiastic, humorous, sensitive, rational, independent, complex, intelligent, emotional, adventurous, have a stable self concept, original, energetic, curious, and imaginative. Creative individuals also have high self satisfaction, enjoy poetry, paintings and architecture

and believe in one's own abilities. The dichotomy exists when creative people also claim to be aloof, reserved, serious, tactless, unconventional, impulsive and report experiencing emotional turmoil.

School Major

When considering the role of college major in the creativity process, one finds literature from the fine arts to the sciences. Evidence suggests (Torrance, 1969) that creative high school seniors with great promise of creative achievement can be selected. Those who score highest on the measure of originality amass an extraordinary record of creative achievement in literature, science, music and art. Those gifted students also seem to have stronger interests in math science, medical science, writing and public speaking than older students of average ability (Fox, Pasternak & Peiser, 1976).

When discussing specific college majors, (Shelton & Harris, 1979) mean scores for fine arts majors are higher than education majors in sensitivity, imagination, experimentation, liberalness and self sufficiency. The mean scores of the education majors are significantly higher on measures of critical, serious, weak super-ego and self conflict. In another study (Stringer, 1967), male and female art students also show a significantly

high mean score in the drive for achievement and creative interests. When comparing education versus non-education majors (Daniels, Heath & Reed, 1983), it is believed there is no evidence to indicate that creativity is linked to a particular college major. Additionally, research (Karlins, Schuerhoff & Kaplan, 1969) indicates academic abilities and achievement seem ineffective as predictors of qualities necessary for architectural creativity.

When considering business majors (Eisenman, 1969), findings show low levels of creativity. It is speculated that business does not attract very creative students or that business simply does not promote creativity. If noncreative people are attracted to business, they are not likely to foster creativity as leaders, on their subordinates (Eisenman, 1969). Additionally, when comparing business students with psychology students (Maier & Hoffman, 1961) it is found that the business students give more new solutions (indicating less creativity) to problems and psychology students give more integrative solutions (both old and new solutions; indicating higher creativity) to the problems. It is speculated the formal authority structure tends to inhibit expressions of creative potential. Business may attract people who can work comfortably, but not creatively, in these formal

authority business systems (Maier & Hoffman, 1961).

In a five year followup study (Schaefer, 1973) there are no differences found in self descriptions, from adjective check lists, between the creative and control groups of math-science boys. A difference had existed originally. A possible explanation for this lack of significant differences in this field is that personality factors related to creativity are not considered to be relevant to scientific success by these college men and beyond (Schaefer, 1973).

Another comparison which includes self-selected adjectives by architecture and business students (Bergum & Cooper, 1977) shows results indicating the architecture students see themselves significantly more creative than business students. In a study consisting of creative professional architects, it is shown (Hall & MacKinnon, 1969), architects exhibit openness to their feelings and emotions and have a sensitive intellect and self awareness.

It is believed that students (Bergum & Cooper, 1977) with differing needs tend to gravitate to activities closely related to those needs. Those who perceive themselves as independent or creative enroll in the schools most associated with those characteristics.

It appears there is a selective process in the choices of undergraduate schools or majors. Those undergraduates of an individualist tendency may expect to succeed in those areas traditionally associated with their preferences and expectations. If there is a time that the undergraduate student whose self perceptions differ from those publicly recognized characteristics of their prospective disciplines, one might be well advised to switch career choices (Bergum & Cooper, 1977).

In summary, some research shows achievement can predict creative success, while other research says academic achievement can not predict some kinds of creativity. Others believe there is not evidence to indicate creativity can be linked to a particular college major. Findings indicate, however, art majors and architecture students are imaginative and score high in creative interests. Other high scores in creativity include architecture (students and professionals). Those who tend to score lower on creativity tests includes business majors and math-science majors. That distinct disciplines reflect differential creativity levels is suggested.

Parental Occupation

Another socio-demographic variable that may influence student creativity and is considered in this

study, is that of parental occupation. When administered creative thinking tests, it is found (Dewing & Taft, 1973) that creative junior high students have fathers who are engaged in professional or executive level occupations.

It is found that middle class families in three different societies (Straus, 1968) exhibit higher creativity test scores than do manual-working class families. It is suggested the deficiencies in communication and (to a lesser extent) creativity are among the factors that underlie the lower problem-solving ability of working class families. Other research shows that having the father employed in some area other than selling or having a technical occupation will enhance a student's performance in architecture (Lunneborg & Lunneborg, 1969).

When assessing the father's occupational autonomy in relation to the child's high creativity, one finds high autonomy scores among the physicians, attorneys and owners of repair shops and low autonomy scores among the bus drivers and civil servants (Weisburg & Springer, 1967). It is also found there is a significantly positive relationship between level of father's occupational autonomy and the child's level of performance on criterion tests of creativity (Weisberg & Springer, 1967). One criterion variable includes

expression without domination in a parent of the same sex as the child. Fathers of the more creative children have "greater occupational autonomy or independence than the fathers of their less creative peers" (Torrance, 1962, p. 78).

When looking at maternal employment, opposing views are found. According to one study, it is indicated that having a mother who is not presently employed outside the home will enhance a student's performance in architecture (Lunneborg & Lunneborg, 1969). It is also found that (Dewing & Taft, 1973) potentially creative girls have mothers who work outside the home at least part-time. This variable is not related to creative potential in boys in this study, however.

Another study indicates (Asha, 1983) that maternal employment has a facilitating influence on the development of creativity in the child. The performance of the children of working mothers is higher than that of the children of non-working mothers. It is suggested professional mothers may emphasize more independence on the part of the children so there is more opportunity for the child to develop curiosity, self-confidence and a sense of exploration that are regarded as essential for the development of creative potential (Asha, 1983).

In summary, research shows that high occupational professional status of the father or having a job other

than a selling or technical type, is related to higher creativity in the child. It is also shown that having a father with high occupational autonomy is related to high creativity in the child. Research doesn't agree, however, with regard to maternal employment, as creative children have mothers that do work outside the home and that do not work outside the home.

Birth Position and Sex of the Creative

When discussing socio-demographic variables of the individual in relation to creativity, birth position within the family and sex of the creative individual shows varying contributing findings. According to Clark & Rice (1982), firstborns are more creative than later borns when creativity is measured by a preference for complexity (an indication of creative potential) on complexity-simplicity tests. Other research suggests (Dember, 1964) however, firstborns have higher "need affiliation" or dependency needs than later borns. "Need affiliation" in this study is given a low motivational interpretation. It is believed (Schachter, 1959) because of differing parental treatment, the firstborn child may acquire stronger affiliative or dependency needs and that later born children (Sears, 1950) seem more independent and may be treated more permissively than firstborns in infancy.

Other research (Farley, 1978) indicates within a two sibling family, greater creativity is shown in the second born over the firstborn. It appears to be restricted to the two sibling family as the significantly greater creativity of the second born disappears with the addition of a third sibling. The conformity and greater seriousness of the firstborn may be associated more with convergent academic achievement while the lack of conformity and rebelliousness of second-borns might be more of the divergent creative type behavior (Farley, 1978). Additionally, one researcher finds Word Association creativity test results indicate later-born males and females score significantly higher than firstborn males and females (Staffieri, 1970). On the Unusual Uses test, there is a significant difference between the firstborn and later-born females but no significant difference between firstborn and later-born males, although the mean score for later born males was higher.

According to one study, when considering family size (from one child to eleven) there are no statistically significant differences on the Minnesota Tests of Creative Thinking scores. However, when comparing sexes, it is found that female children score significantly higher than male children on verbal elaboration and language achievement. Another study

indicates there are no significant differences in male versus female creativity measures or firstborn versus later-born differences on creativity measures among females (Eisenman & Schussel, 1970). There is, however, a significant difference in firstborn versus later born males in creativity scores where the firstborn males score higher than the later-born males. This is explained in this group, in part, by high creativity not being indicated in firstborns as much as low creativity is indicated in later borns (Eisenman & Schussel, 1970). Other findings indicate that firstborn males seem to be more creative, show more need for achievement but are also more conforming to peer influences than later-born males (Sampson, 1965).

In another study (Helson, 1968), creative individuals and their siblings is considered. Creative children and their male and female siblings show consistent superiority on intuition, complexity of outlook, originality and art scale creativity scores. It is suggested that if the creative is not the oldest (according to this study), there is an older brother who serves as a model and a younger sister whose competition serves to push the creative child toward independence (Helson, 1968). It is also suggested, however, since males do not necessarily surpass females, the competitive male makes his sibling more alert than does

the more passive female (Koch, 1954).

Additionally, (Eisenman, 1967a; Eisenman, 1968b) later born females prefer the greatest amount of complexity (an indication of high creativity) and later born males not only prefer the least complex shapes (indication of low creativity), results indicate they actually dislike the more complex shapes (shapes which indicate high creativity). The complexity-simplicity dimension has been linked to creativity and personality variables. With regard to the similarity of later-born females and firstborn males in preferring complexity, it is suggested (Eisenman, 1967b) that males receive an honored position in the family as the eldest male, while firstborn females may be more responsive to social influence which may inhibit the older female more than their less intensely socialized later-born sisters (Eisenman, 1967b). In another study by the same researcher (Eisenman, 1968a) creativity test results show that females prefer complexity regardless of birth order.

In summary, research indicates firstborn females are found to be less creative than later-born females but no significant differences are found for sex or birth position. Later-born females and firstborn males are found to be more creative than their sibling. It is suggested that having a brother may help more than

having a sister in influencing the creative child. The competitive brother may serve as a better model for the creative child than a more passive sister. It is also acknowledged (Schachter, 1963) that the repeated finding of a surplus of firstborns among eminent scholars appears to not be as related to birth order as it is just a reflection of scholars, eminent or not, derived from a college population in which firstborns are in marked surplus.

Research findings indicate both the firstborn and later-born children are considered most creative. When large families are considered, there does not seem to be a significant difference in creativity between firstborn and later-born children. When eminence is determined, the abundance of eminence among firstborns seems to merely be a function of more firstborns being in college. There appears to be much controversy among researchers when considering birth position, sex and creativity.

Perceived Family Characteristics and Cohesiveness

It is within the home environment that potential creativity may be realized. Research has been conducted regarding the family environment and creative individuals. It is indicated that family environment

influences the development of the creative individual (Kennett, 1984; Guilford, 1964).

It is a sense of safety and affection which ranks high as "only in a friendly environment can we expect creative growth of a healthy kind to take place" (Torrance, 1962, p. 185). It is within a home where parental concern should be focussed on the creative child's openness to experience, values, interests and enthusiasm (Torrance, 1962). It is suggested (Srivastava, 1977) that the sense of freedom, a greater chance of experimentation with completion, and cooperation in the home environment is responsible for creative growth.

Within the homes of those who become eminent, (Goertzel, et al., 1978) there is a love of learning in one or both parents, often accompanied by a physical exuberance and a persistent drive toward goals. The high-creative family is one in which individual divergence is permitted and risks are accepted (Getzels & Jackson, 1967).

The opposite type of home environment can also exist in the lives of eminent people (Goertzel, et al., 1978). Many homes may have been troubled by quarreling parents, divorce, financial ups and downs and parental inability to cope with the child's delinquencies, failures and wrong career choices. It appears that

creativity and contentment within the home are not always compatible (Goertzel, et al., 1978). Others also believe (Gowan, 1957) underachievers come from homes that show evidence of conflict, authoritarianism by the parent or domination by the child. Additionally, artistic boys may come from a home environment where the bond with the parents is not strong (Brooks, 1973). There is also some indication of separation from the family contributes to the creative potential of the child (Eisenman & Foxman, 1970). Contact with parents as one grows up, but separation during the college years leads to creativity. By the time one goes to college, living at home may reflect a lack of independence on the part of the child and the parents will probably continue to exert control. This is considered detrimental to creative functioning as one buys security by living at home but pays for it by giving up independence (Eisenman & Foxman, 1970).

When discussing parents of the creative versus control child, research shows that parents of creative children exhibit their own creative behavior (Domino, 1979) and that their responses are sometimes more unusual (Dewing & Taft, 1973). Fathers of female creative writers frequently have one or more hobbies of an artistic or literary nature (Anastasi & Schaefer, 1969).

When considering family cohesion, one study indicates (Nichols, 1964) expressed authoritarian child rearing on the part of the mother was related to lack of originality, although the child may obtain higher grades in school and receive favorable ratings by the teacher. Another study indicates (Heilbrun, 1971) college males who receive high control and low nurturance from their mother score lower in creativity. Earlier (Heilbrun & Waters, 1968), it was suggested that high control and high nurturing mothers may foster a home environment in which good habits toward academic achievement are learned by the son, resulting in more reactivity to social evaluation cues and dependency (lower creativity). Female college students perceive having overprotecting mothers are also more highly sensitized to social reinforcement (Heilbrun & Gillard, 1966). In another study (Siegelman, 1973) rejecting parents are more often reported by sons and daughters who possess creative potential, while loving parents are more frequently described by sons and daughters with less creative potential. In this particular study, it is speculated that rejecting parents unconsciously encourage a rebellious attitude, which results in independent thinking and action in the child. Loving parents, on the other hand, unconsciously encourage conformity in the child.

Another view shows (Heilbrun & Orr, 1966), when given a performance test those male undergraduates who perceive their mothers as accepting of them, maintain the least change in level of aspiration after the first experimental failure experience while those who perceive having rejecting mothers result in the lowest level of aspiration after their performance on Trial 1. What is indicated is the rejected students express less confidence in spatial discrimination ability than the accepted students. It is proposed that failure influences goal setting in the rejected group more than in the accepted group because of lower self esteem (Heilbrun & Orr, 1966).

Results from another study show (Domino, 1969) the creative-artistic male is more likely to daydream and his relationship to his parents appears to be centered around shared interests in artistic or literary pursuits more often than around a warm personal relationship. He also does not describe family discipline as always fair as frequently as the control group (Schaefer & Anastasi, 1968). Other research (Parish & Eads, 1977) indicates students who are perceived as having permissive mothers score significantly higher on measures of creativity. Another study (Helson, 1966) finds that mothers of highly creative college females are more frequently described as moody (than nurturant) and fathers are

perceived more frequently as strict.

In further research (Helson, 1967) creative female students at a private liberal-arts college report ties of differing quality but equal strength with each parent at present. When looking at female mathematicians (Helson, 1971) one finds they perceive their fathers to seldom be warm people and they feel ambivalence toward their mother.

Another study (MacKinnon, 1962) looked at present architects within their past family units. Results indicated there was often a lack of intense closeness with one or both parents (usually in relation to the father) and a tendency for the architect to have identified either with both parents or with neither. There also do not seem to be strong emotional ties (either positive or negative), between the child and parent and neither a sense of over-dependency or sense of rejection. It is speculated (MacKinnon, 1962) this has had a liberating effect on the child and through the lack of emotional closeness, the child is spared psychological exploitation. It is also believed (MacKinnon, 1962) discipline was almost always consistent and predictable with rules, family standards and the parental injunctions were known by the children and seldom infringed.

In summary, research shows that creative children come from varied home environments. Findings show creativity is encouraged by a friendly home environment that is open to experience, has a sense of freedom and cooperation. The family also encourages divergence and risks are accepted. On the other hand, studies indicate creative people report family conflict. In terms of family cohesion, being raised by authoritarian mothers, lack of creativity in the child is the result. Also, having rejecting parents is frequently related to a highly creative (and lower confidence) child. As stated previously, this rejection encourages rebelliousness and independent thinking. The college age creative tends to live away from home. There also appears to be a sense of distance from the parents which reflects neither overdependency nor rejection, thus no psychological exploitation.

In conclusion, creativity is a concept involving a diversity in definitions and characteristics when applied to different groups of people. It is both the process and product of creativity that is involved in all aspects of living as no part of existence is void of some kind of creativity. What has been presented here includes a sense of the creative individual's family where individual divergence is permitted, risks are accepted (Getzels & Jackson, 1962; Getzels & Jackson,

1967) and learning is valued "for its own sake" (Roe, 1953, p. 74).

CHAPTER III

METHOD AND PROCEDURE

There are many indicators for identifying creative people. What is worth noting is the validity of some of these tests (Suler, 1980) as well as the long range effects of education and training programs and environmental variables (Taylor & Holland, 1964). Bellak believes (1958), the creative person is usually inspired to create but when put into an experimental environment, he or she feels the requirement to create. For some people, the creative urge is a stable and constant variable, while sporadic in others so evaluating at particular times may present a problem.

It is also believed (Romaniuk & Romaniuk, 1981) that age and cohort groups differ in experiences, and approach to testing. Test sophistication, test anxiety, motivation and test conceptualization can influence consistency of test results, independent of creative abilities. It is to be noted these are self-report instruments which result in people's impressions (Reiss, 1983), but a useful way to measure creativity is to simply ask the subject if he is creative (Walkup, 1971) as he is aware of his unique abilities, habits and

experiences (Davis & Subkoviak, 1975) Most are quite honest about this point and the subject, in most cases, knows more about himself than peers, supervisors and teachers (Hocevar, 1981). It is for these reasons of the respondent's awareness of his own creative abilities (Davis & Subkoviak, 1975) and honesty about himself (Hocevar, 1981) that the How Do You Think? (Form E Adult, Davis, 1977) self-report creativity instrument was selected for this sample. The Family Adaptability and Cohesion Evaluation Scales instrument (FACES III, Olson, Portner & Lavee, 1985) also was selected for these reasons and was considered appropriate for assessing a sense of family within the family unit.

It is also acknowledged that social research is imprecise regardless of technique utilized Careful attention was given, however, to the sample selection procedure so that findings would represent those responding.

Research Design

This study was concerned with the relationships that exist between those respondents who were high, medium and low creatives and the level of perceived family adaptability and cohesion they experienced. This quantitative approach to research was concerned with analyzing the relationships between selected variables.

A general pattern or description was the intent rather than an individual uniqueness approach as would be present in qualitative research. The dependent variable in this descriptive study was creativity level, while school major, parental occupation, birth position, sex, and perceived family adaptability and family cohesion were the independent variables. It was of interest to determine how high or low in adaptability or how high or low in cohesion a family was perceived by the respondent in their resultant high, medium or low creativity levels. The objectives of this study were to compare differences or assess patterns, if any, in respondents' creativity levels when considering the respondents' school major, parental occupations, birth position, sex and family adaptability and cohesion.

Sampling Process

The sample chosen for this study included three classes of interior design majors and one class of hotel and restaurant administration majors. The three interior design classes were in the College of Home Economics (HIDCS 1123, HIDCS 2223, and HIDCS 2313) and totalled 36 students. The one hotel and restaurant administration class (HRAD 1102) was also in the College of Home Economics and totalled 44 students. All courses were offered at Oklahoma State University. It was

believed the freshman and sophomore status student had not yet been fully exposed to purposeful teaching of creativity (or noncreativity) as he or she was not yet fully into his or her particular academic major program which could accentuate or de-emphasize the creative process. A sample size of 36 students was determined to be statistically valid (Cohen, 1977) for the freshman and sophomore population who were interior design majors in the College of Home Economics and 44 students who were hotel and restaurant administration majors in the College of Home Economics. For this study, a medium sized effect was expected and at at least .8 power.

Instrumentation

Because of some creativity test validity, environmental effects, respondent motivation or performance anxiety and sporadic inspiration, it was decided an instrument which simply required the subject to respond with regard to his perception of his creativity would be quite appropriate. As previously mentioned (Walkup, 1971; Davis & Subkoviak, 1975), the respondent is well aware of his own levels of creativity and will be quite knowledgeable and honest about himself (Hocevar, 1981).

With these criteria in mind, the instruments chosen for this study were the How Do You Think?; Form E Adult

(HDYT; Davis, 1977) and the Family Adaptability and Cohesion Evaluation Scales (FACES III; Olson, Portner, & Lavee, 1985), Another instrument was developed to collect additional demographic information.

How Do You Think?

The How Do You Think? (HDYT) instrument was selected for assessing a predisposition toward creativity by collecting data regarding the respondent's personal perceived level of creative ability by indicating the degree to which the statement applied to himself or herself. The instrument consisted of 100 statement (five-choice rating scale) items which assessed traits of artistic and aesthetic interests, curiosity, risk taking, self confidence, energy level, adventurousness, sense of humor, self rating of creativity and originality and information pertaining to past hobbies and creative activities. The five choice answer scale consisted of response selections ranging from No (score value of 1) to Definitely (score value of 5); Totally Disagree (1) to Totally Agree (5); and False (1) to True (5). Reliability had been established on the earlier 102 statement How Do You Think?, Form B instrument (Bull, 1978) at .93. For this study, reliability was established by an SPSS-X reliability program on the How Do You Think? instrument

and was found to be .74. Validity was established with How Do You Think?, scores correlating to creativity ratings at a validity coefficient of .42 (for men, $r = .64$, $p < .01$; and for women, $r = .36$, $p < .01$) (Davis, 1975).

The How Do You Think? scale was categorized into low, medium and high creativity levels where a natural score break occurred. The scores of the creativity instrument ranged from 236 through 413 with a mean creativity score being 313.5. The low creative category included scores ranging from 236 through 295 ($n = 27$), the medium creative scores ranged from 296 through 324 ($n = 27$) and the high creative scores ranged from 327 through 413 ($n = 26$).

Family Adaptability and Cohesion Evaluation Scales

The Family Adaptability and Cohesion Evaluation Scales (FACES III; Olson, Portner & Lavee, 1985) circumplex model was chosen because it describes the underlying dynamics of a family system and was considered appropriate for this study of the respondent's sense of family adaptability and cohesion. It was a twenty item scale instrument with answers varying from 1 (almost never) to 5 (almost always). The numerical answers to the odd numbered questions were added to attain a score of cohesion while the numerical

answers to the even numbered questions were added to attain an adaptability score. This model categorizes dimensions of "rigid", "structured", "flexible", "chaotic", "disengaged", "separated", "connected" and "enmeshed".

The 20 items of the FACES III scale were selected from those items used in a national survey of 1,000 normal families (Olson, 1986). Validity was established with the adaptability and cohesion dimensions of the scale being uncorrelated (r = .03). Social desirability has an impact on many self report scales so the authors attempted to minimize its impact. The correlation between social desirability and adaptability is zero (r = .0) but there is some correlation between social desirability and cohesion (r = .39). The instrument was reported to have internal reliability with the cohesion scale having a correlation of .62 (Olson, 1986). For this study, reliability was established by an SPSS-X reliability program and was found to be .71 for the adaptability scale and .87 for the cohesion scale.

Both the How Do You Think? instrument (HDYT) and Family Adaptability and Cohesion Evaluation Scales (FACES III) were simple to administer, non-threatening to subjects and amenable to empirical analyses. The demographic questionnaire was administered to collect additional demographic information, not covered by the

other two inventories that were pertinent for the study. The results of instruments were then analyzed by chi square analysis, Pearson correlation and analysis of variance.

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Creativity Levels of Interior Design and Non-interior Design Majors

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Manuscript prepared for submission to The Journal of Interior Design Education and Research

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Abstract

Previous research indicates little or no evidence to suggest creativity is linked to a particular college major though others believe certain college majors have students who score higher on creativity tests. This study was conducted to determine creativity levels of interior design (ID) majors and non-interior design majors (hotel and restaurant administration; HRA). A creativity instrument (How Do You Think?; Form E Adult; Davis, 1977) was administered during regular classtime to 36 ID majors and 44 HRA majors. Results indicate that the ID major scored significantly higher than HRA majors and that males scored higher than females. There was no interaction effect of sex and major. Data were discussed in relation to selection and identification of ID majors.

Creativity Levels of Interior Design and Non-Interior Design Majors

Introduction

Interior Design is a profession which requires a high degree of creativity, because the interior designer must be able to adequately solve problems related to business, interior space and client needs. With the increasing awareness of barrier free design, fire and safety factors, legal and ethical liability and basic functional and aesthetic working and living spaces, it is vital that the interior design professional be as competent, qualified and creative as possible. It will be those individuals who will solve problems presented and pose problems and foresee solutions that will make the difference (Smilansky & Halberstadt, 1986). The issue of training people to think more creatively is truly vital for any society (Lipper, 1987).

There is little research regarding the creativity levels of interior designers and interior design students. Further, there is conflicting evidence about creativity among specific college majors. Some previous research

has considered creativity levels in professions related to design.

When comparing architecture and business students, the architecture students were significantly more creative than business students (Bergum & Cooper, 1977). It is speculated that less creative persons may be attracted to business where people work comfortably but not creatively within a formal authority business structure (Maier & Hoffman, 1961). Other research (Karlins, Schuerhoff & Kaplan, 1969) indicates academic abilities and achievement seem ineffective as predictors of qualities necessary for architectural creativity.

There appears to be a selective process in the choice of undergraduate majors. It is suggested that distinct disciplines reflect differential creativity levels (Runco & Bahleda, 1986). However, some researchers (Daniels, Heath and Reed, 1983) conclude there is no evidence to indicate that creativity is linked to a specific college major.

Since the space planning and specifying aspects of the interior design profession are related to creativity, it was deemed vital to study the

student who was beginning an interior design program. The objective of this study was to compare creativity levels of interior design majors and non-interior design majors (Hotel and Restaurant Administration) in the College of Home Economics.

Method

Sample

The sample consisted of 80 respondents. This included 36 interior design (ID) majors (29 females and 7 males) and 44 hotel and restaurant administration (HRA) majors (21 females and 23 males). The freshman and sophomore status was chosen because the student was beginning their major program. Therefore, any emphasis on creativity specifically, would not yet be totally integrated into the program. Gender was added as a variable to control for possible interaction effects with school major.

Instrument

Creativity was measured using the How Do You Think?; Form E Adult (HDYT, Davis, 1977). This instrument consisted of 100 statements (five choice rating scale) which assessed such traits as

artistic and aesthetic interests, curiosity, risk taking, self confidence, energy level, adventurousness, sense of humor, self rating of creativity and originality and information pertaining to past hobbies and creative activities (Bull and Davis, 1980). The five point Likert-like scale was used.

The SPSS-X reliability program, using the Cronbach's Alpha reliability coefficient, established reliability at .74 in this study. Validity had been established (Davis, 1975) with ratings of creative products with a product to score correlation of .42 (for men, r = .64; and for women, r = .36).

Results

A 2 x 2 analysis of variance was conducted for creativity scores by gender and college major. The main effects for both college major, $F(1,76) = 13.92$, $p < .01$ and gender $F(1,76) = 4.45$, $p < .05$ were significant with no significant interaction term. ID majors scored higher than HRA majors and males scored higher than females (see Table I).

Insert Table I about here

Creativity scores were grouped to create low (n = 27), medium (n = 27) and high (n = 26) creativity levels and compared to college major. Overall group mean scores include 276.4 (sd = 15.6) for low, 308.8 (sd = 8.2) for medium and 356.8 (sd = 26.6) for high creativity levels.

Table II shows the frequencies and percentages by creativity level and major. A Chi Square analysis revealed significant differences between the two majors with more of the ID majors being represented in the high creative group ($X^2 = 6.9$, $p < .05$).

Insert Table II about here

It is interesting to note that the overall mean score for this sample on the HDYT creativity instrument was 313.5. Other studies have found much higher mean scores of 340 (Bull, 1978) using a heterogeneous undergraduate sample. Perhaps this

discrepancy is due to geographic location, type of class or capability of students. The source of this difference cannot be addressed in this paper but should be pursued.

Discussion

Results indicate those freshmen and sophomores majoring in interior design in this study scored significantly higher on the creativity instrument than those majoring in hotel and restaurant administration. The overall mean score for ID majors is 327.4 and for those majoring in HRA, it is 302.1. Sex of the respondent was of concern since one cell size was relatively small and the interior design sample was predominantly female. With sex controlled, however, it appears that college major contributes more variation than sex of the respondent in creativity scores.

In light of these results, it seems the interior design college program may initially attract a more creative student or enhance creative predisposition in the student more than the hotel and restaurant administration college program does. The interior design program may help develop creativity skills early in the required coursework.

With these results, it becomes apparent that one must look closer at the issue of college major and creativity levels of students. Assessing how creative one must be in order to succeed in specific college programs should be included in recruiting.

Further research is needed to expand the findings and to assess the role of college major in creative development during the course of a college program. Talent is the stuff of which future history is made (Taylor, 1984) whether it be direct leadership or ideas and inventions that lead the world into new eras of living (Taylor, 1986). Ideally, it is through the fusion of school learning, the working world and self understanding that this future orientation can be creatively expressed (Torrance & Safter, 1986). Until then, the question remains regarding one's true creative level before and after a college major program, how one ends up in a particular area of study and how creativity levels ultimately affect success in the interior design profession.

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TABLE I

CREATIVITY MEANS AND STANDARD DEVIATIONS
BY COLLEGE MAJOR AND GENDER

	College Major			
	Interior Design		Hotel and Restaurant Administration	
Gender	($\bar{X}$ = 327.4)		($\bar{X}$ = 302.1)	
	n	mean (sd)	n	mean (sd)
Male				
($\bar{X}$ = 318.1)	7	338.4 (50.1)	23	311.9 (31.5)
Female				
($\bar{X}$ = 310.7)	29	324.8 (37.1)	21	291.4 (30.2)

TABLE II

FREQUENCIES AND PERCENTAGES BY CREATIVITY LEVEL AND COLLEGE MAJOR

	Creativity Level					
	Low Creative n=27		Medium Creative n=27		High Creative n=26	
Major	n	%	n	%	n	%
Interior Design n=36	9	25.0	10	27.8	17	47.2
Hotel and Restaurant Adminis-tration n=44	18	40.9	17	38.6	9	20.5

The Role of Family Adaptability and Cohesion In Undergraduate Creativity

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This article is based on the Doctoral dissertation research of the author in partial fulfillment of requirements for a PhD degree in the Department of Housing, Interior Design and Consumer Studies, College of Home Economics, Oklahoma State University

Abstract

This study was conducted to determine the respondent's perceived family adaptability and cohesion levels with respect to their creativity. Creativity was measured using the How Do You Think?, Form E Adult instrument (Davis, 1977). Adaptability was measured using the Family Adaptability and Cohesion Evaluation Scales instrument (Olson, Portner & Lavee, 1985). Subjects were 36 interior design majors and 44 hotel and restaurant administration majors. Results indicate that the highest creativity mean score came from chaotic families and those with the lowest creativity mean scores were in rigid families, as determined from the FACES III Adaptability Scale. These results indicate family adaptability and openness rather than family cohesion appears to affect creativity of its members.

The Role of Family Adaptability and Cohesion In Undergraduate Creativity

Research regarding the family environment and creative individuals indicates the family environment influences the development of the creative individual (Kennett, 1984; Guilford, 1964). There is conflict, however, on what type of family environment is best. Torrance (1962, p. 185) states, "only in a friendly environment can we expect creative growth of a healthy kind to take place". Parental concern should be focussed on the creative child's openness to experience, values, interests and enthusiasm. Srivastava (1977) suggests that the sense of freedom, a greater chance of experimentation with completion and cooperation in the home environment is responsible for creative growth. Russell believes (1979) families that handle situational and developmental crises successfully will be higher in creativity than families that are less successful in handling crises. As a family moves through the life cycle, it attempts to maintain a status quo (Minuchin, Rosman & Baker, 1978) or achieve a balance of

connectedness as a unit while maintaining individuality (Hess & Handel, 1959). Research (Eisenman & Foxman, 1970) shows contact with parents while growing up leads to creativity. It seems one's perceived family adaptability and cohesion may affect one's level of creativity. Within the homes of those who become eminent, some found there is a love of learning exhibited by one or both parents and a persistent drive toward goals (Goertzel, Goertzel & Goertzel, 1978). The high creative family may also be one in which individual divergence is permitted and risks are accepted (Getzels & Jackson, 1967).

On the other hand, other studies show that many homes of eminent people can also be troubled by quarreling parents, inability to cope with the child's failures, and wrong career choices (Goertzel, et al., 1978). Some (Brooks, 1973; MacKinnon, 1962) have found that the bond with the parents is not strong and frequent intrafamily conflict or indifference is felt (Albert & Runco, 1986). The creative artistic male does not describe family discipline as always fair (Schaefer & Anastasi, 1968), but almost always as consistent

and predictable with rules (MacKinnon, 1962).

When considering the concept of family cohesion and creativity, opposing views are expressed in the literature. Within a marital therapy context, Olson (1986) suggests that higher levels of cohesion, high support and high creativity are associated with high family functioning (Russell, 1979). Olson, Sprenkel & Russell (1979) indicate couples not in counselling are significantly more creative and more supportive than those seeking counselling. Expressed authoritarian child rearing by the mother relates to lack of originality in the child (Nichols, 1964) and those receiving high control/low nurturance from their mother score lower in creativity (Heilbrun, 1971). It was earlier suggested (Heilbrun & Waters, 1968) that high control/high nurturing mothers may foster dependency (an indication of lower creativity).

The sense or perception of degree of cohesion is also expressed when having rejecting parents is more often reported by those who possess creative potential, while having loving parents is more frequently described by those with less creative potential (Siegelman, 1973). It is speculated that

rejecting parents unconsciously encourage a rebellious attitude, resulting in independent thinking and loving parents unconsciously encourage conformity in the child (Siegelman, 1973). Yet this view is not consistent with that of Olson or Torrance, as previously mentioned.

Additional research indicates the human experience of identity has the element of belonging and of separateness (Minuchin, Baker, Rosman, Liebman, Milman & Todd, 1975). Separation from the family during college years seems to contribute to the creative potential of the student (Eisenman & Foxman, 1970). MacKinnon (1962) reports from his study of creative architects, that as children they had been given more freedom to roam and explore. It is believed (Whitaker, 1977), a healthy family is one that maintains inner unity as well as individuation. One should feel freedom to leave and return without family dissension and be able to belong to intimate subgroups outside the family. It is this dichotomous situation of perceived cohesion in the family leading to both higher and lower creativity, in part, that has led to this study.

There is a conflict in the literature in terms of addressing the variables related to high creativity. With the issue of adaptability, highly creative individuals seem to come from a flexible environment which allows freedom for expression and exploration for alternative solutions. The literature also presents the lack of consistent rules among some creatives. This chaotic or disengaged state may relate to creativity. The low cohesive family that does not adequately solve problems may influence the high creative's abilities through discontent, disapproval or inner suffering.

What may be in question is the underlying understanding or meaning of the term creativity. The operational definition of creativity for the family researcher and therapists seems to be the methods by which successful solutions for situational problems are obtained. Findings indicate that the rigid to chaotic aspects of adaptability and the disengaged to enmeshed aspects of cohesion within a family may influence creativity. Perhaps, creativity encompasses the spirit of adventure and chaos as well as high

cohesion. The common denominator or synthesis of this conflicting literature may be in the sense of freedom of expression and autonomy within a family structure, whatever degree of structure or flexibility the family might have.

The objective of this study was to shed light on the conflicts in research findings by assessing the role of perceived family adaptability (through degrees of rigid to chaotic) and cohesiveness (through degrees of disengaged to enmeshed) in relation to perceived creativity in the respondents.

Method

Subjects

The sample consisted of 80 freshman and sophomore students. This included 36 interior design (ID) students in three classes (29 females, 7 males) and 44 hotel and restaurant administration (HRA) students in one class (21 females, 23 males).

Instruments

Adaptability and Cohesion Scale. The Family Adaptability and Cohesion Evaluation Scales (FACES III; Olson, Portner, & Lavee, 1985) circumplex model was selected because it describes underlying dynamics of a family system. It was

considered appropriate since it assesses a sense of family by measuring adaptability and cohesion within the family unit.

FACES III (Olson, 1986) is a twenty statement instrument with answers on a scale of 1 (almost never) to 5 (almost always). Family adaptability categories include chaotic, flexible, structured and rigid. The family cohesion categories include disengaged, separated, connected, and enmeshed. Families can be either balanced or unbalanced. The balanced levels are hypothesized to be most viable for healthy family functioning and the extreme areas are generally seen as "more problematic" for families over time (Olson, Portner, & Lavee, 1985, p. 4). The two balanced levels of family adaptability are flexible and structured while the balanced levels of cohesion are separated and connected.

The instrument is reported to have internal reliability with a cohesion correlation of .77 and an adaptability correlation of .62 (Olson, 1986). Construct validity was established between the adaptability and cohesion scales with a correlation of .03 indicating these scales to be independent.

For this study, reliability was established by Cronbach's Alpha reliability coefficient using the SPSS-X reliability program and was found to be .87 for the cohesion scale and .71 for the adaptability scale.

Creativity Instrument. The How Do You Think?, Form E Adult (HDYT, Davis, 1977) instrument consisted of 100 statements (five point Likert-like rating scale) which assessed such traits as artistic and aesthetic interests, curiosity, risk taking, self confidence, energy level, adventurousness, sense of humor, self rating of creativity and originality and information pertaining to past hobbies and creative activities.

Reliability for the HDYT was established by Cronbach's Alpha reliability coefficient using the SPSS-X reliability program and was found to be .74. Validity was earlier established (Davis, 1975) with HDYT scores correlating to ratings of creative products with an overall correlation of .42 (for men; $r = .64$, $p < .01$; and for women, $r = .36$, $p < .01$).

The instruments were administered during regularly scheduled class time. All subjects voluntarily participated.

Results

Separate oneway analyses of variance were conducted on the adaptability and the cohesion scales of the FACES III instrument. The HDYT scores served as the dependent variable and four categories of adaptability and cohesion served as independent variables. Significant differences were found on the adaptability scale $F(3,76) = 2.78$, $p < .05$ but not on the cohesion scale.

Persons from chaotic families had the highest mean scores, followed by flexible families and structured families. Those from rigid families had the lowest mean score (see Table III). Tukey analysis revealed a significant difference between the chaotic and rigid groups.

Insert Table III about here

Of interest was to determine where the high creatives fit into the balanced, mid-range and extreme families model. An analysis of variance

was then conducted for creativity scores by the family type (balanced, mid-range, and extreme) but no significant differences between the group means of balanced (317.7), mid-range (308.6) and extreme (316.8) family types were evident.

Discussion

This study indicates that enhanced family adaptability, even to the extreme is related to creativity. It also seems to show that a sense of family cohesion is not a critical indicator of high individual creativity. Within the family, adaptability is evidenced through flexibility, freedom and looseness. Within this family, one would be able to make one's own mistakes as a learning process. The major finding in this study is that the ability of the family to be highly adaptable even to the point of being chaotic seems to foster creativity. Previous literature seemed to focus on issues related to cohesion (i.e., rejecting or together families), yet this led to conflicting findings. In this study, only the dimension of adaptability (i.e., freedom) seemed to be critical.

In addition, there were no significant differences between the balanced, mid-range and extreme family types. According to the creators of the adaptability and cohesion scales (Olson, Portner & Lavee, 1985) families successful in handling situational and developmental crises are balanced. This study indicates high creatives come from extreme, mid-range and balanced families. This may help explain contradictions in the literature which have used retrospective studies.

With the advancement into the 21st century in this mass information processing age, the need for highly creative people is more vital than ever before. There will be many key people making decisions for groups of people and consequently, affecting other's lives. It is valuable to gain understanding into the creative mind and life and to discover patterns for enhancement of creativity. It would be valuable for the educational institutions and counselling professions to eventually be able to predict, guide and nurture the creative process.

In light of this study, it appears that high creativity is associated with adaptable families which tend to have flexibility. With the changes the family unit is going through today, the results from this study have positive and hopeful implications for those people who pursue professions which require a creative mind as the traditional family unit evolves into new dimensions and restructuring.

More research and longitudinal studies need to be conducted as there are long term concerns presented here. It is acknowledged there are many more variables influencing creativity and these still need to be pursued. Perhaps, a combination of other specific socio-familial demographic variables would also shed new light on this vital topic.

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TABLE III

MEANS AND STANDARD DEVIATIONS FOR CREATIVITY SCORES ON THE FACES III INSTRUMENT

	Creativity Scores		
	n	Mean	Standard Deviation
Adaptability Scale			
Chaotic	31	324.0	41.0
Flexible (Balanced)	27	314.1	36.3
Structured (Balanced)	15	305.1	29.1
Rigid	7	282.7	27.8
Total n =	80		
Cohesion Scale			
Disengaged	24	306.0	33.08
Separated (Balanced)	17	314.6	35.44
Connected (Balanced)	22	318.6	46.62
Enmeshed	17	316.2	34.6
Total n =	80		

The Influence of Birth Position, Sex, Number of Siblings and Parental Occupations on Undergraduate Creativity

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This article is based on the Doctoral dissertation research of the author in partial fulfillment of requirements for a PhD degree in the Department of Housing, Interior Design and Consumer Studies, College of Home Economics, Oklahoma State University

Abstract

Creativity may first be nurtured within the family. Previous research shows creative children have fathers in professional or executive level occupations and mothers employed both outside and inside the home. Research also finds both firstborn males and females as well as later born males and females are considered creative. This study was conducted to determine if parental occupation, birth position, number of siblings and sex is related to the respondent's creativity. Creativity was measured using How Do You Think?, Form E, Adult (Davis, 1977). Subjects were 36 interior design majors and 44 hotel and restaurant majors. Results indicated that respondents with no siblings scored significantly higher than other groups. None of the other variables were related to the respondent's creativity level.

The Influence of Birth Position, Sex, Number of Siblings and Parental Occupations on Undergraduate Creativity

It is within the home environment that potential creativity may first be realized (Albert & Runco, 1986). Family environment influences development of the creative individual (Kennett, 1984; Guilford, 1964) as creative behavior is determined by interaction of the individual and the environment (Mumford & Gustafson, 1988). Goertzel, Goertzel & Goertzel (1978) find there is a love of learning and a persistent drive toward goals among creative individuals. Findings indicate independence allows creative functioning (Eisenman & Foxman, 1970) and that some adult creatives report more freedom, as children, to roam and explore (MacKinnon, 1962).

Research on creative individuals who select self-describing adjectives shows a dichotomy in results. Some creative students select terms such as active, enthusiastic, humorous, tactless and unconventional, but also aloof, reserved, serious, sensitive and rational (Domino, 1970). Creative adolescents see themselves as creative, independent

(Schaefer, 1969), self confident, enthusiastic, energetic, curious, having a sense of humor, risk takers and preferring complexity and originality (Davis, Peterson & Farley, 1974). High creatives have also been characterized as having a higher moral ethical self concept (Whiteside, 1977) and a sense of self-actualization (Buckmaster & Davis, 1985). They enjoy poetry, paintings, architecture, more liberal views about the existence of God (Phillips, 1973) and become absorbed in emotional experiences such as those aroused by art and music (Gilchrist, 1982). Several demographic variables have been studied in relation to home environment and creativity. Most notable among these are birth position, gender, number of siblings and parental occupation.

When considering birth position within the family and sex of the creative individual, there are conflicting findings. According to Clark & Rice (1982), firstborns are more creative than later-borns. Others, however, (Dember, 1964) find firstborns have higher dependency needs than later-borns. If substantiated, this indicates lower creativity. Indeed some research finds

(Staffieri, 1970) later-born males and females score significantly higher than firstborn males and females on Word Association creativity tests, but these tests have been criticized as being IQ dependent. In the same study on the Unusual Uses test (Staffieri, 1970) later-born females scored higher than firstborn females, but no significant difference was found for males. Conversely, Eisenman & Schussel (1970) find there is no difference in creativity scores of complexity-simplicity preference measures for females but firstborn males score significantly higher than later-born males. Eisenman (1967) suggests males receive an honored position in the family as the eldest male while firstborn females may be more responsive to social influence which may inhibit the older female more than the less intensely socialized later born females. Eisenman (1967, 1968) also finds later-born females are highly creative, later-born males are low creatives and females prefer complexity (indicating high creativity) regardless of birth order. Yet another study (Sampson, 1965) finds that firstborn males are more creative but are also more conforming to

peer influences than later-born males. Farley (1978) finds greater creativity shown in the second-born over the firstborn when considering the two sibling family and that the greater creativity of the second-born disappears with the addition of a third sibling. Other research (Eisenman & Schussel, 1970) finds no statistically significant differences in creativity levels when considering family size of one to eleven children. In general, there seems to be no concensus on birth order. There appears the need to sort out several of these variables in one study utilizing the same instrument.

When considering the role of parental occupation in student creativity, research shows (Straus, 1968) middle class families exhibit higher creativity test scores than do working class families. Dewing & Taft (1973) find that creative students have fathers in professional or executive level occupations. Another study (VanTassel-Baska, 1983), of gifted students, shows the most common occupations among fathers is business management (20%), professors (15%) and engineers (13%). Torrance (1962) also finds that fathers of creatives have greater

occupational autonomy or independence. Weisberg & Springer (1967) also agree there is a significant positive relationship between level of father's occupational autonomy and the creative's level of performance on criterion tests of creativity where father's of high creatives exhibit high autonomy scores.

When assessing maternal employment, findings indicate having a mother employed both inside and outside the home influences the child's creativity. A mother not presently employed outside the home is related to enhanced student's performance in architecture (Lunneborg & Lunneborg, 1969). Another study (Vantassel-Baska, 1983) finds among mothers of high creatives that 64% have at least a four year college degree, 27% of those being a master's degree or Ph.D. degree. Although these women are well educated, many are full time homemakers. The level of maternal education (and father's occupational prestige) does not always correlate significantly with maternal work status (Lerner & Galambos, 1986). However, maternal employment can have a facilitating influence on the development of creativity in the child (Asha, 1983).

Dewey & Taft (1973) find that potentially creative females have mothers who work outside the home at least part-time.

It is acknowledged there are varied research findings. The objectives in this study were to investigate the influences of birth position, respondent's sex, number of siblings and parental occupations in the respondent's creativity.

Method

Sample Selection and Description

The sample of 80 respondents consisted of 36 freshman and sophomore interior design majors in three interior design classes and 44 hotel and restaurant administration majors in one hotel and restaurant administration class. The instruments were administered during regularly scheduled class time and respondents voluntarily participated.

Instruments

Creativity Instrument. The creativity instrument used was the How Do You Think?; Form E Adult (HDYT, Davis, 1977). The instrument consists of 100 statements (five-point Likert-like rating scale) which assesses such traits as artistic and aesthetic interests, curiosity, risk taking, self

confidence, energy level, adventurousness, sense of humor, self rating of creativity and originality and information pertaining to past hobbies and creative activities.

The SPSS-X reliability program using the Cronbach's Alpha reliability coefficient computed reliability at .74 in this study. Validity was established in previous studies with HDYT scores correlating to ratings of creative products with an overall correlation of .42 (for men; $r = .64$, $p < .01$; and for women, $r = .36$, $p < .01$) (Davis, 1975).

Socio-demographic questionnaire.

The questionnaire gathered information regarding birth position, sex, number of siblings, father's occupation and mother's occupation. This questionnaire preceeded the creativity instrument.

Results

A Pearson correlation was computed to examine the relationship between creativity scores and four specific variables. The correlations are as follows: sex of respondent (-.095, ns), birth position of respondent (-.205, $p = .05$), mother's occupation (-.063, ns), father's occupation (-.162,

ns) and number of siblings (-.232; p = .02). Significant correlations were found between creativity scores and birth position and between creativity scores and number of siblings. An analysis of procedure indicated a significant difference F (3,76) = 3.49, p < .02 between the sibling groups. Table IV shows means and standard deviations of creativity scores by number of siblings.

Insert Table IV about here

Tukey tests demonstrated significant differences between the no siblings and one sibling groups, the no siblings and three or more siblings groups and between the two siblings and three or more siblings groups. The overall sample mean score was 313.5. When considering sibling groups the highest mean score was attained by the no siblings group (349.4) while the lowest mean score was by the three or more siblings group (298.2).

The last objective was to assess the influence of parental occupations on respondents' creativity scores. An analysis of variance for creativity

levels by mother's occupation and father's occupation indicated no significant differences between the parental occupation groups. Family type did not seem to be a significant factor in contributing to high creativity. Although not statistically significant, it is worth noting sixty-two (77.5%) respondents in this sample did have at least one professional parent and that 22 (85%) of the high creatives were in this one or more professional parent category.

Summary and Conclusions

In this study, there is a significant difference in number of siblings but not birth position for creativity scores. Other research (Eisenman & Schussel, 1970) on family size (up to eleven children) shows no differences on creativity tests. Runco & Bahleda (1987) find birth order is related to creativity scores with only children having significantly higher test scores than children in other family positions. This study indicates there is a difference in the number of siblings groups when considering overall creativity scores. The no sibling group has the highest overall mean score (349.4) while the three or more

sibling group has the lowest overall mean score (298.2). Perhaps, because of enhanced child-adult interaction, the respondent with no siblings excels in creativity. Interestingly, respondents with two siblings also do well in creativity as their mean score is higher than the overall sample mean score. Respondents with two siblings may have had to be creative in assuring their own share of things as they grow up. With the below average creativity among those with three or more siblings, rivalry for the basics in life within a large family may become a distracting process in itself before ample time or energy can be spent on creative activities. There would also be a greatly reduced amount of time spent with adults for more mature interaction.

Parental occupation with regard to respondent's creativity level in this study was not found to be significant. Research (Asha, 1983) indicating higher creativity among children whose mothers work outside the home suggests that more independence on the part of the child is emphasized affording more opportunity to develop curiosity, self confidence and sense of exploration. The influence of the mother's professional versus nonprofessional status

does not seem to be present in this study. Also, there may be a relationship between the large number of professional parents and the sample itself, being all university students. Perhaps, if there were more blue collar parents, respondent creativity levels or overall mean creativity scores may have been influenced.

With the findings in this study a need is seen to possibly assess more varied age groups, different colleges or geographic locations. Parental educational level or family mobility may also influence the data.

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TABLE IV

CREATIVITY MEAN SCORE FREQUENCIES AND STANDARD DEVIATIONS BY NUMBER OF SIBLINGS

Number of Siblings	n	overall mean	standard deviation
No Siblings	5	349.4	40.6
One Sibling	26	310.9	29.6
Two Siblings	27	321.7	46.3
Three or more	22	298.2	26.2
Overall sample	80	313.5	

APPENDIXES

APPENDIX A

SOCIO-DEMOGRAPHIC,
FAMILY ADAPTABILITY/COHESION AND
CREATIVITY INSTRUMENT

_____student I. D. number

This is a research project which is made up of a simple socio-demographic questionnaire and one of several diverse questions. On the main part of the questionnaire, there are no right or wrong answers. I just ask you to answer each question as honestly as you can. Thank you.

____I voluntarily agree to participate in answering questions on the following questionnaire and understand my answers will be held in complete confidence.

MARK THE NUMBER OF YOUR RESPONSE IN THE SPACE PROVIDED ON THE LEFT OF THE QUESTION NUMBER:

____1. Mark your sex
1. male
2. female

____2. Your age

____3. Total number of children in present family including yourself

____4. School classification
1. freshman (0-30 hours)
2. sophomore (31-60 hours)
3. junior (61-90 hours)
4. senior (91-120 hours)

____5. School major
1. Interior Design Major
2. Hotel, Restaurant Administration Major
3. Other

____6. I have had two parents in the home in which I was raised at least 80% of the time
1. yes
2. no

____7. During most of my life, my father's occupation can best be described as

1. Professional/technical	10. Service worker
2. Manager/administrator	11. Private household worker
3. Salesworker	12. Government or military worker
4. Clerical worker	13. Retired
5. Crafts worker	14. Student
6. Machine operator	15. Homemaker
7. Laborer	16. Disabled
8. Farmer/farm manager	17. Not gainfully employed
9. Farm foreman/laborer	18. Other_____

____8. During most of my life, my mother's occupation can best be described as

1. Professional/technical	10. Service worker
2. Manager/administrator	11. Private household worker
3. Salesworker	12. Government or military worker
4. Clerical worker	13. Retired
5. Crafts worker	14. Student
6. Machine operator	15. Homemaker
7. Laborer	16. Disabled
8. Farmer/farm manager	17. Not gainfully employed
9. Farm foreman/laborer	18. Other_____

____9. At the time of my birth, I was the _____ in my family
1. First born
2. Second born
3. Third or later born

____10. List sex and age of all siblings in family (identify step-brother or step-sister status if appropriate)

1.	6.
2.	7.
3.	8.
4.	9.
5.	10.

INDICATE THE DEGREE TO WHICH EACH STATEMENT APPLIES TO YOU. MARK YOUR ANSWERS ON THE PAGE ACCORDING TO THE FOLLOWING SCALE:

1. **NO**
2. **TO A SMALL EXTENT**
3. **AVERAGE**
4. **MORE THAN AVERAGE**
5. **DEFINITELY**

____11. I enjoy the confusion of a big city.

____12. I often think like a child.

____13. I am sophisticated.

____14. I am very independent.

____15. I am very likely to do things on impulse.

____16. I choke-up or sob in many movies.

____17. I would like to live and work in a foreign country.

____18. When I was young, I was always building or making things.

____19. I would like to learn mountain-climbing.

____20. I usually value others' opinions more than my own.

____21. I have a great many interests.

____22. I am unconventional in many ways.

____23. I would like to try sky-diving (parachute jumping).

____24. I prefer to pre-plan and schedule vacations carefully.

____25. I have done a lot of creative writing.

____26. My parents participate in, or were highly interested in art or writing.

____27. My parents were always in some form of hobbies or handicrafts.

continued: 1. **NO**
2. **TO A SMALL EXTENT**
3. **AVERAGE**
4. **MORE THAN AVERAGE**
5. **DEFINITELY**

____28. I am a sensitive person.

____29. I am very artistic.

____30. I am neat and well-ordered.

____31. I would like to have lived in the early unsettled days of our American history.

____32. I am quite absent-minded.

____33. I worry about being considered foolish.

____34. I am often inventive or ingenious.

____35. I enjoy trying new approaches to problems.

____36. I usually jump right into a lake or cold pool, instead of slowly getting used to it.

____37. I am a risk-taker.

____38. I would like to be hypnotized.

____39. I like a cold, brisk day.

INDICATE THE DEGREE TO WHICH YOU ACCEPT OR BELIEVE THE SEVEN STATEMENTS BELOW. USE THE FOLLOWING SCALE:

1. **FALSE**
2. **PROBABLY FALSE**
3. **DON'T KNOW (NEUTRAL)**
4. **MIGHT BE TRUE**
5. **TRUE**

____40. Many people can mentally communicate with others through extra-sensory perception (ESP).

____41. Psychics truly possess a mysterious ability to know things about a person's past and future.

____42. Psychics also are able to predict such things as national disasters, election results, political assassinations, etc..

____43. Many stories of mysterious, psychical happenings are true.

____44. Spirits may be contacted by mediums or others with special psychic powers.

____45. Flying saucers are visitors from outer space.

____46. Strong mental concentration can exert a slight physical force.

INDICATE HOW STRONGLY YOU AGREE OR DISAGREE WITH THE STATEMENTS BELOW. MARK YOUR ANSWERS ACCORDING TO THE FOLLOWING SCALE:

1. **TOTALLY DISAGREE**
2. **MOSTLY DISAGREE**
3. **NEUTRAL**
4. **MOSTLY AGREE**
5. **TOTALLY AGREE**

____47. It is important to be able to laugh at ourselves.

____48. It is better to be calm and even tempered than emotionally expressive.

____49. The world would be better off if youth were disciplined more severely.

____50. A good painting should give you a jolt.

____51. I know what I will be doing ten years from now.

____52. I would rate myself high in self-confidence.

INDICATE THE DEGREE TO WHICH EACH STATEMENT APPLIES TO YOU. USE THE FOLLOWING SCALE:

1. **NO**
2. **TO A SMALL EXTENT**
3. **AVERAGE**
4. **MORE THAN AVERAGE**
5. **DEFINITELY**

____53. I am confident in my intellectual ability.

____54. I worry about making mistakes.

____55. I tend to be cynical.

____56. I would like a career which involves much traveling.

____57. I have a great sense of humor.

____58. I have always been active in drawing or painting.

____59. I prefer activities which are predictable.

____60. I would like to get a pilot's license.

____61. I like to explore new cities alone even if I get lost.

____62. I am a very active, energetic person.

____63. I enjoy thinking of new and better ways of doing things.

____64. I am very curious.

continued: 1. **NO**
2. **TO A SMALL EXTENT**
3. **AVERAGE**
4. **MORE THAN AVERAGE**
5. **DEFINITELY**

____65. I tend to become childishly involved with simple things.

____66. I am quite original and imaginative.

____67. I have had many hobbies.

____68. Some of my past or present hobbies would be considered "unusual".

____69. I am very idealistic.

____70. I like the nonsense forms and bright colors of modern art.

____71. I enjoy some amount of ambiguity in my life.

____72. My ideas are often considered "impractical" or even "wild".

____73. I would like to be considered courteous and emotionally stable.

____74. I am very concerned about what others think of me.

____75. I like to play tag, hopscotch, etc. with the kids.

____76. I have a peaceful, non-enthusiastic approach to life.

____77. I am very "reflective".

____78. I would rate myself high in "intuition" or "insightfulness".

____79. I avoid activities which are a little frightening.

____80. I like some body smells.

____81. I would take a college course which 50 percent flunk.

____82. I am able to work intensely on a project for many hours.

____83. I like trying new ideas and new approaches to problems.

____84. I am witty.

____85. I often become totally engrossed in a new idea.

____86. I live in a room which is usually a mess.

____87. On vacation, I prefer a good motel to camping.

____88. I am absolutely against drugs which might produce hallucinations or other strange effects.

____89. I would like to take up skiing.

____90. I am very conscious of aesthetic considerations.

continued: 1. **NO**
2. **TO A SMALL EXTENT**
3. **AVERAGE**
4. **MORE THAN AVERAGE**
5. **DEFINITELY**

____91. Most of my friends are unconventional.

____92. The word "quick" describes me.

____93. I try to use metaphors and analogies in my writing.

____94. I am moody.

____95. I could be considered a "spontaneous" person.

____96. I have engaged in a lot of creative activities.

____97. I take a playful approach to most things.

____98. I am always open to new ideas and new activities.

____99. Throughout my education, I had a lot of parttime jobs.

____100. I have participated in theatrical productions.

____101. I am usually outspoken in my opinions.

____102. Financial success is highly important to me.

____103. I often reflect on my personal values.

____104. I often attend concerts.

____105. My parents visit art galleries and museums.

____106. I enjoy a job with unforseeable difficulties.

____107. I think it's fun to explore museums.

____108. I can sometimes "get lost" in a library for hours, just looking at interesting books.

____109. Sometimes I get so interested in a new idea that I neglect what I should be doing.

____110. I have taken things apart just to find out how they work.

INDICATE THE DEGREE TO WHICH EACH STATEMENT APPLIES TO YOU AND YOUR FAMILY NOW:

1. **ALMOST NEVER**
2. **ONCE IN AWHILE**
3. **SOMETIMES**
4. **FREQUENTLY**
5. **ALMOST ALWAYS**

____111. Family members ask each other for help.

____112. In solving problems, the children's suggestions are followed.

____113. We approve of each other's friends.

____114. Children have a say in their discipline.

____115. We like to do things with just our immediate family.

____116. Different persons act as leaders in our family.

____117. Family members feel closer to other family members than to people outside the family.

____118. Our family changes its way of handling tasks.

____119. Family members like to spend free time with each other.

____120. Parent(s) and children discuss punishment together.

____121. Family members feel very close to each other.

____122. The children make the decisions in our family.

____123. When our family gets together for activities, everybody is present.

____124. Rules change in our family.

____125. We can easily think of things to do together as a family.

____126. We shift household responsibilities from person to person.

____127. Family members consult other family members on their decisions.

____128. It is hard to identify the leader(s) in our family.

____129. Family togetherness is very important.

____130. It is hard to tell who does which household chores.

APPENDIX B

SUPPLEMENTARY TABLES

TABLE V

ANALYSIS OF VARIANCE FOR CREATIVITY SCORES BY SEX AND COLLEGE MAJOR

Source of Variation	df	Sum of Squares	Mean Square	F
Main Effects	2	18188.2	9094.1	7.37*
Sex	1	5488.6	5488.6	4.45**
College Major	1	17181.7	17181.7	13.92*
Interaction of Sex*Major	1	173.2	173.2	.14
Between groups	3	18361.4	6120.5	4.96*
Within groups	76	93790.6	1234.1	
Total	79	112152.0	1419.7	

*$p \leq .01$

**$p \leq .04$

TABLE VI

ANALYSIS OF VARIANCE FOR CREATIVITY SCORES BY THE VARIABLE CREATIVITY LEVEL/COLLEGE MAJOR

Source of Variation	df	Sum of Squares	Mean Square	F
Between Groups	5	87881.0	17576.2	53.6*
Within Groups	74	24271.0	328.0	
Total	79	112152.0	1419.7	

*p < .01

TABLE VII

OBSERVED AND EXPECTED FREQUENCIES AND PERCENTS OF HIGH CREATIVES ON THE FACES III INSTRUMENT

Adaptability Scale		Cohesion Scale: Disengaged	Separated	Connected	Enmeshed	Total n / Percent
Chaotic	observed	2	0	7	4	13
	expected	2	3	5.5	2.5	50.0%
Flexible	observed	0	5	3	1	9
	expected	1.4	2.1	3.8	1.7	34.6%
Structured	observed	2	1	1	0	4
	expected	.6	.9	1.7	.8	15.4%
Rigid	observed	0	0	0	0	0
	expected	0	0	0	0	
Total n		4	6	11	5	26
Percent		15.4%	23.1%	42.3%	19.2%	100.0%

TABLE VIII

ANALYSIS OF VARIANCE FOR CREATIVITY SCORES
BY FAMILY TYPE AND CREATIVITY LEVEL

Source of Variation	df	Sum of Squares	Mean Square	F
Main Effects	4	86658.1	21664.5	63.0*
Family Types	2	226.9	113.5	.33
Creativity Level	2	85180.4	42590.2	123.8*
2-Way Interaction	4	1065.8	266.5	.8
Between Groups	8	87723.9	10965.5	31.9*
Within Groups	71	24428.1	344.1	
Total	79	112152.0	1419.7	

*p < .01

TABLE IX

CREATIVITY MEAN SCORE FREQUENCIES AND STANDARD DEVIATIONS FOR FAMILY TYPE AND CREATIVITY LEVEL

	Creativity Level							
	Low A* SD=15.6		Medium A SD=8.2		High A SD=26.6			
Family Type	n	Mean	n	Mean	n	Mean	Total n	Total Mean
Balanced SD=38.5	7	277.0	6	304.3	10	354.2	23	317.7
Mid-range SD=37.0	15	276.9	10	312.3	10	352.6	35	308.6
Extreme SD=38.7	5	274.4	11	308.1	6	368.2	22	316.8
Total	27	276.4	27	308.8	26	356.8		

*Capital letters indicate a .05 significance level between pairs

TABLE X

CREATIVITY MEAN SCORE FREQUENCIES AND STANDARD DEVIATIONS FOR FAMILY TYPE AND CREATIVITY LEVEL

	Creativity Level* (overall mean; 313.5)							
	Low Creative (SD=15.6)		Medium Creative (SD=8.2)		High Creative (SD=26.6)			
Family Type	n	mean	n	mean	n	mean	Total n	Total mean
One/Both Professional (SD=37.6)	13	279.9	12	310.5	15	357.1	40	318.1
Professional and Homemaker (SD=38.9)	5	268.8	10	306.5	7	357.9	22	314.3
Nonprofessional and Homemaker (SD=39.7)	4	275.8	4	309.0	2	374.5	10	308.8
Both Non-Professional (SD=32.0)	5	275.6	1	311.0	2	333.0	8	294.4
Total	27	276.4	27	308.8	26	356.8		

TABLE XI

CREATIVITY MEAN SCORE FREQUENCIES
BY NUMBER OF SIBLINGS AND
CREATIVITY LEVEL

	Creativity Level (overall mean = 313.5)					
Number of Siblings	Low (n = 27)		Medium (n = 27)		High (n = 26)	
	n	mean	n	mean	n	mean
No Siblings	0		1	303.0	4	361.0
One Sibling	7	276.4	10	305.8	9	343.4
Two Siblings	10	277.3	7	312.6	10	372.6
Three or more Siblings	10	275.6	9	309.9	3	338.7

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