CREATIVITY AND BIRTH ORDER

A THESIS

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CHAPTER I

Introduction

The Problem

The main purpose of the study was to determine whether or not there is a significant difference in creativity among first, second, and third born females. Research in the area indicates inconsistent results as to whether the first or third born child is the more creative. The second or middle child is omitted from past research. The second purpose of the study was to determine the relationship between birth order and grade point averages (GPA). The relationship between creativity and GPAs was also examined briefly.

Significance of the Problem

The findings of the study will help the science of psychology through an understanding of the relationship between birth order and creativity. The study will provide the clinical psychologist with information about a S's creative behavior and the relationship this has with her position in the family. Testing creativity may provide clues to problems of personality disturbance, delinquency,

and mental health. For example, studies indicate that elaboration is involved in achievement at school, that a lack of it is characteristic of delinquents, and that high elaborators worry about not being able to meet the high expectations that their peers have of them (Torrance, 1974). Children with learning disabilities or behavioral difficulties may show highly creative behavior on figural tests but show low creativity on verbal tests (Torrance, 1974). The results of the study will aid the school psychologist and educators in understanding the female student's potential in specific courses such as art, English, music, and poetry. Testing creativity will provide a basis for the improvement of an educational program which would allow students to achieve their potentialities. Teachers will gain a better overall concept of the individual student, who will then become aware of his own behavior and will develop a more realistic self-concept.

Definitions

The first born female is defined as the first child born in a family. The middle born female is defined as the female who occupies the second position in a family. The later born female is defined as the female who occupies the third position in a family. Only children are considered to be first born.

Creativity is usually defined in terms of a person, product, process, or press. Rhodes (1961) refers to the four definitions as the "four P's of creativity [p. 307]." He defines the word creativity as a "noun naming the phenomenon in which a person communicates a new concept, which is the product [p. 305]." He believes that mental process is implicit in the definition and that no one could conceive of a person living in a vacuum, so "press" is also implicit [p. 305].

Thurstone (1952) explains that an act is creative if the person achieves the solution in a "sudden closure which suggests a newness for him [p. 18]." The idea might be artistic, theoretical, mechanical, or administrative if the idea solves an organizational problem.

Stein (1953) maintains that creativity should be defined according to the culture in which it is used. The creative product must contain new elements even though it may involve a reintegration of previous knowledge.

Many investigators define creativity by contrasting it with conformity. The creative person contributes original ideas and different viewpoints. Conformity is seen as doing what is expected without disturbances to others. Crutchfield (1962) believes that independent thinking is necessary for creative thinking. Crutchfield (1962) found in his

experiments that independent thinkers were able to

> function effectively under stress, relatively unsusceptible to generalized anxiety, relatively free of feelings of inferiority and inadequacy, open and free in emotional processes, ascendent in relations with others, persuasive, expressive, active and vigorous, and able to seek and enjoy aesthetic and senuous impressions [p. 429].

Guilford (1960) defines creativity in terms of mental abilities involved in creative achievement. Creative thinking includes fluency, flexibility, originality, and elaboration.

Based upon an analysis of the above definitions, Torrance (1965) defines creativity as

> a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies; identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses about the deficiencies: testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results [p. 8].

The purpose of the present study is to investigate the relationship between the variables birth order and creativity.

CHAPTER II

Resume of Related Research

Staffieri (1970) investigated the difference between first and later born Ss on measures of creativity. He administered the Word Association Test and the Uses Test to a group of first and later born males and females. The results found later born Ss scoring significantly higher than first born Ss on both measures. There was no significant difference between first and later born males but a significant difference was found for first and later born females. Significant differences for males and females were determined on the Word Association Test.

Eisenman and Schussel (1970) studied the relationship between birth order and creativity using complexity-simplicity measures, the Personal Opinion Survey, and the Unusual Uses Test. They found that first born males and later born females tended to prefer more complex problems than later born males and first born females (Eisenman, 1967). However, later born Ss preferred more complex problems than first born Ss regardless of sex in another study by Eisenman (1968). The results of the 1970 study indicated that all correlations were significant. Subjects who scored high on one creative

measure tended to score high on the other measures. Three hundred and ten Ss out of 450 Ss tested preferred complex problems, while 140 Ss obtained minus scores. No sex differences were determined on the creativity measures and no significant differences were found among first and later born females. On the other hand, later born males showed less creativity on each measure as compared to first born males. The authors suggested that the findings were due to the low creativity among later born males rather than due to the high creativity among first born males.

Eisenman and Cherry (1970) studied the relationship between authoritarianism and creativity and found that the two variables were inversely related. The creative person tends to have liberal values and to be open to new experiences while the authoritarian tends to be conservative, lacks openness, and is opposed to change.

Research on birth order suggests that first borns tend to be more conservative, intellectual, and achievement oriented, which may be due to early childhood rearing practices. However, Eisenman and Schussel (1970) found that first born males preferred more complex measures than later born males, while later born females preferred more complex measures than first born females. Because preference for complexity

is related to creativity, the first born Ss would not only be more conservative but also less creative than later born Ss.

Eisenman and Cherry (1970) administered a 30-item true-false measure of creativity, a version of the California F Scale. The authors designed a 10-item yeasaying-naysaying test to control for acquiescence response set. They used a 6-item introversion-extraversion scale and a modified unusual uses test. Subjects were classified as high, middle, or low in authoritarianism. Chi-square tests indicated a significant relationship between authoritarianism and creativity and between authoritarianism and originality. This supports the idea that a high score on one variable would be associated with a low score on the other variable. However, this holds true only for Ss who are classified as high or low in authoritarianism rather than in the middle of the extremes. First born males were significantly less likely than later born males to be authoritarian. The two creativity tests indicated some degree of similarity, with high scores on one relating to high scores on the other. First born females did not score significantly higher on creativity measures than later born females.

Helson (1968) studied female graduates who had been previously classified as creative using the Institute of

Personality Assessment Test. The brothers and sisters of the Ss all had higher scores than other Ss on measures of cognitive traits in relation to creativity. The creatives and their brothers showed achievement orientation, while the sisters did not. All of the creatives and most of their brothers were first or second born; all of their sisters were third, fourth, or the younger of the two. Data from a questionnaire administered to siblings and their parents showed that creative women and their brothers had felt grievances from sibling competition due to idealistic and demanding parental values. The sisters were friendlier with the mother, had less confidence and had not perceived the demanding parental values as did the other Ss.

Lichtenwalner (1969) studied the creativity of 68 middle and lower class Caucasian children attending a nursery school, a day care center, or a kindergarten by using an object-identification originality test. The purpose of the study was to determine whether or not creativity was acquired or inherited and the effect of ordinal position upon creativity. Results indicated no significant differences between oldest or only children and later born children in either sex group. The mean score for oldest and only children was about three points higher than the mean score for later born children. The first born or only child showed greater

creativity than the later born child, but the difference was not significant. Characteristics of the parental relationship such as anxiety, overprotectiveness, and restrictiveness do not appear to inhibit the creative development of the first born child. Instead, the first born receives more stimulation, both verbal and physical, from his parents and he is most likely to act as the leader among his siblings. Middle class children scored significantly higher in creativity than lower class children. The author suggested that maybe lower class children received little attention, harsh punishment, and inadequate stimulation. Creativity appeared to be an acquired ability dependent upon a stimulating environment.

Lunneborg (1971) studied the relationship between sex, sex of siblings, aptitude, and achievement in 402 male and 492 female high school students from two-child families. Sixteen two by two analyses of variance for each sex were conducted using a least-squares solution for unequal cell frequencies for GPAs in English, foreign languages, mathematics, natural science, and electives; for five verbal tests of vocabulary, English usage, spelling, reading speed, and reading comprehension; and for five nonverbal tests of quantitative skills, applied mathematics, mathematical achievement, spatial ability, and mechanical reasoning.

First born males were superior to second born males on fifteen measures, but significantly different only on five measures.

In contrast, Lunneborg (1968) found in an earlier study that first borns always had significantly higher means than later born Ss. The differentiation between first and later borns decreases as family size decreases. Birth order showed little affect among females. When comparing the total female mean among female second borns, older sisters were associated with increased performance, while older brothers were always associated with decreased scores. Among female first borns, younger brothers always increased performance relative to the entire female sample, while younger sisters sometimes improved performance. Among males, similar findings were obtained. The results of the study suggested that when the birth order effect fails to reach significance, it has been weakened by the interaction with the sex of siblings.

Oberlander (1970) tested the hypothesis that there is a significant relationship between family size, birth order, and scholastic aptitude and achievement. Subjects were 165 male and 153 female eighth graders. Oberlander used scores on the Science Research Associates (SRA) High School Placement Test, which measured IQ and four achievement

scores. GPAs were based on grades received during the first semester of Ss' high school years. Results indicated that first borns had higher IQ scores than later borns. Family size was not significantly related to the other measures in the study. There was a significant sex difference for GPAs. The mean GPAs for females was 17.70, while the mean GPA for males was 15.72. First borns had higher GPAs than later borns. The mean for first borns was 16.95 and the mean for second borns was 16.49. The relationship between sex and birth order was significant, which was the result of first born males having higher GPAs than later born males, while later born females had higher GPAs than first born females.

Eisenman and Platt (1968) conducted a study on college grades using the Internal-External Control Scale (I-E), which determines personality correlates of academic achievement in relation to birth order and sex. Subjects were 131 middle class freshman college students. They stated that the first born child is generally noted for conformity and eminence. If the first born male achieves eminence more often than could be expected by chance, such achievement might be indicated in academic grades. If the first born S's achievement is based upon the need for social recognition, the first born S may be more external than later born Ss on

the I-E Scale. However, the first born S may be more internal than later born Ss if achievement is due to greater drive or achievement motivation rather than the need for recognition. Results showed that females made better grades than males regardless of birth order, even though the findings were more marked for first born females and males than later born Ss. First born males were significantly more external than internal on the I-E Scale. There was no significant relationship found between grades and I-E Scale scores.

The previous studies indicate conflicting results among each other as to whether the first or later born child is the more creative and the previous studies tend to omit the second born child. The present study took into consideration the creativity of the second born child as related to first and later born child. The previous studies cite differences between male and female creativity whereas the present study focused only on the female. The relationship between birth order and GPAs, as related to creativity, was also determined in the study.

Hypotheses

Hypothesis #1: There are no significant differences among the mean creativity scores for the three birth order groups.

Hypothesis #2: There are no significant differences among the mean GPAs for the three birth order groups.

CHAPTER III

Procedure

General Design

The type of design was the one-way analysis of variance (ANOVA). In hypothesis #1, the independent variable was birth order (first, second, and third) and the dependent variable was creativity. In hypothesis #2, the independent variable was birth order and the dependent variable was GPA.

Subjects

Thirty Texas Woman's University female freshmen who were enrolled in undergraduate psychology courses and who volunteered for the study served as Ss. Students were divided into three groups with ten Ss in each group according to the following birth order positions: first born, second born, and third born. The mean age of the Ss was 18.7 years.

Instrumentation

The Torrance Tests of Creative Thinking (TTCT), which is designed to measure elaboration, fluency, flexibility, and originality, was employed. There are two forms of the

tests, verbal and figural. The figural form B was used. Test-retest reliabilities range from .50 to .93 over one to two week periods, and from .35 to .73 over three year periods. Studies of test-retest reliabilities are higher for adults (Goralski, 1964; Mackler, 1962) and older children (Grover, 1963) than for younger children (Wodtke, 1963). Test-retest reliabilities have been shown to be influenced greatly by motivational factors in the testing situation. Consistent motivation is easier to maintain in older than in younger Ss. The validity of the TTCT is based upon more than fifty studies using children, adolescents, and adults as Ss. Concurrent validity appears to be related to testing general academic aptitude, while predictive and construct validity seem to be weak. However, most of the evidence appears generally consistent with the literature on creative behavior, and the TTCT seems valid and reliable for research purposes.

Figural form B includes three activities with a time limit of ten minutes for each task. The first activity, Picture Construction, is designed to elicit elaboration and originality. Subjects were expected to think of an interesting and unusual story that no one in the group would create, using a bright orange jelly bean shape with an adhesive backing, placed in any direction on the opposite blank page. The shape was to be used as an important part of the picture.

The second activity, Picture Completion, is designed to stimulate fluency, flexibility, originality, and elaboration. Subjects were required to produce original responses for ten incomplete figures. However, Ss had to "control their tensions" in order to complete the figures in the easiest way and "delay gratification of the impulse to closure [Torrance, 1974, p. 14]."

The third task, Repeated Figures, measures fluency, flexibility, originality, and elaboration. Using forty circles, Ss were expected to "make as many objects as possible, make as many different pictures, try to think of things that no one else would think of, put as many ideas into each picture and make them tell as complete and as interesting story as possible" (Torrance, 1974). In Repeated Figures, fluency competed with the other three measures.

Subjects completed a questionnaire from which the following information was obtained: name and age of S, number and ages of siblings, approximate yearly family income, and grades received in S's first semester of college (see Appendix A). The TTCT was administered to thirty-nine first, second, and third born females in one group setting. Thirty Ss were randomly chosen for assignment to groups.

Raw scores for the three figural activities were computed according to the TTCT scoring guide (Torrance, 1974).

In scoring Picture Construction, originality was based upon the responses of five hundred Ss ranging from kindergarten through college. Responses occurring on 5% or more of the records received no credit; those found in 4% to 4.99% received one point; those found in 3% to 3.99% of the records were awarded two points; those found in 2% to 2.99% of the cases received three credits; those occurring in 1% to 1.99% received four credits. All other responses showing imagination and creative strength were given five points. In scoring elaboration, one point was awarded for the essential details of the total response which were color, shading, and decoration; one point was awarded for each major variation of design meaningful to the total response; and one point was awarded for each elaboration in the title beyond the minimum descriptive label.

Responses for the second task, Picture Completion, were classified into categories. The flexibility score was determined by counting the number of different categories into which the responses fell. The fluency score was the number of figures completed. The elaboration score was determined in the same manner as that in Picture Completion. In scoring originality, responses received zero, one, or two points.

In scoring the Repeated Figures activities, scores on fluency, elaboration, and flexibility were obtained in the

same way as in the Picture Completion activities. Originality responses found in 10% or more of the records were given no credit. Responses occurring in 5% to 9% of the records received one point; those found in 2% to 4% of the cases were given two points. All other responses showing imagination and creative strength received three credits. Bonus points were awarded for the combination of two or more circles in a single response. The combination of two circles received two points. The combination of three to five circles received five bonus points. Ten points were awarded for combining six to ten circles; fifteen points for combining eleven to fifteen circles; twenty credits for combining more than fifteen circles; and twenty-five points for combining all circles on both pages into one structure.

Raw scores were summarized for each group of first born Ss, second born Ss, and third born Ss (see Appendix B). A one-way analysis of variance was used to analyze Ss' raw scores to determine if the means of the three groups differed significantly. Grade point averages were determined from the questionnaires, which contained a list of the grades received in the first semester of Ss' freshman year (see Appendix C). A one-way analysis of variance was used to analyze GPAs to determine if the means of the three groups differed significantly. The level of significance used for both analyses was set at .05.

CHAPTER IV

Results

The means and variances of the scores on the TTCT and GPA are reported in Table 1. The results of the study indicated a great amount of variability within groups. There was a trend for first born Ss to have a higher sample mean on the creativity measure, but the difference was nonsignificant (see Table 2). Therefore, the null hypothesis was accepted at the .05 level of significance.

Table 1

Means and Variances on the TTCT and GPA

	TTCT		GPA	
	Mean	Variance	Mean	Variance
First born	161.1	1311.0	2.586	.3986
Second born	146.7	1568.4	3.084	.1929
Third born	148.0	1661.1	3.109	.3139

Table 2

Analysis of Variance: Scores on the TTCT

Source	df	SS	MS	F-ratio
Between	2	1268.87	634.435	.4191378*
Within	27	40869.00	1513.666	
Total	29	42137.87		

*p is greater than .05.

The mean GPA for third born Ss was higher than the mean GPAs for second and first born Ss. However, the difference was nonsignificant and the null hypothesis was accepted at the .05 level of significance (see Table 3).

Table 3

Analysis of Variance: GPAs

Source	df	SS	MS	F-ratio
Between	2	1.74053	0.870265	2.8845844*
Within	27	8.14577	0.3016951	
Total	29	9.88630		

*p is greater than .05.

The correlation between the scores on the TTCT and GPA was calculated and found to be -.2034. However, when the correlation was tested for significance, it was found to be nonsignificant.

CHAPTER V

Discussion and Conclusions

First, second, and third born female freshmen attending the Texas Woman's University were used in the study. Therefore, the results cannot be generalized to the entire female population or to geographical areas not included in the investigation.

The first finding fo the study was that there were no significant differences among the mean creativity scores, as measured by the TTCT, for the three birth order groups. This corresponded to the results of Lichtenwalner's (1969) investigation. She found no significant differences between first born or only children and later born Ss in either sex group. First born or only children did not score significantly higher than later born children on an object-identification originality test of creativity. Eisenman and Cherry (1970) also found similar results that first born females did not score significantly higher than later born females on creative measures. In addition, Eisenman and Schussel (1970) discovered no significant differences among first and later born females on complexity-simplicity measures of creativity.

However, the findings of the present study differed from the results of Staffieri's (1970) investigation in which later born females scored significantly higher than first born females on the Word Association Test and the Uses Test.

The second finding of the study was that there were no significant differences among the mean GPAs for the three birth order groups. This corresponded to the results of Lunneborg's (1971) study that birth order had little affect among female GPAs and test scores. Oberlander's (1970) investigation found that later born females had higher GPAs than first born females. Eisenman and Platt (1968) found that females made better grades than males regardless of birth order. In contrast, Lunneborg's (1968) study indicated that first born Ss always had significantly higher mean GPAs and test scores than later born Ss.

Murphy (1973) investigated the relationship between the scores of 139 male high school students on the M. Wallach and N. Kogan creativity tests, common intelligence test scores, and grades in English, science, social studies, and math for grades nine through eleven. The results of the study indicated that creativity was significantly related to school grades. However, the findings of the present study disagreed with Murphy's findings. The correlation between creativity and GPA of -.2034 was found to be nonsignificant.

In support of the present findings, Taylor (1964) stated that it would be easy to identify students with high creativity if school grades were efficient predictors of creativity, but the nature of the academic situation was noncreative and needed to be modified before grades could be valid predictors of creativity. Taylor (1964) believed that knowledge alone was not a sufficient condition for creativity. In addition, Thurstone (1953) believed that creativity and school achievement, particularly grades, were at opposite poles.

The following conclusions were made based upon the results of the present study: for the subjects involved in the study, the three birth order groups did not differ in terms of mean creativity scores; for the subjects involved in the study, the three birth order groups did not differ in terms of mean GPAs; and for the subjects involved in the study, creativity and GPAs were not correlated.

Appendix A

Questionnaire

Questionnaire

Name_____

Age_____

Number of siblings_____

Ages of siblings_____

Approximate yearly family income_____

List grades received in first semester of freshman year:_____

_____

_____

_____

_____

_____

Appendix B

Raw Scores on the TTCT

Raw Scores on the TTCT

Independent Variable

First Born	Second Born	Third Born
192	111	100
166	183	100
124	189	127
201	169	182
164	125	159
146	177	181
194	107	115
115	89	222
201	195	169
108	122	125
1611	1467	1480

Appendix C

Grade Point Averages

Grade Point Averages

Independent Variable

First Born	Second Born	Third Born
2.00	3.66	3.00
2.83	2.40	3.43
2.80	3.20	3.33
3.00	3.00	3.57
2.20	3.33	3.40
1.20	3.25	3.40
3.00	2.80	2.66
3.40	2.40	2.00
2.83	3.20	2.50
2.60	3.60	3.80
25.86	30.84	31.09

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