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Differences in gifted and nongifted students and their birth order

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Abstract

In recent years research has been conducted to determine the effects of birth-order on a child. A child's sex, physical attributes, size of family, presence or absence of parents, and order of birth, all have effects on a child's development. Birth-order places a child into a special arrangement with the other members of the family. A child's birth-order in his family is both a structural and a processional variable (Albert, 1980). Family structure determines which family member will have the greatest effect on the child. As a process, birth order helps determine the length and intensity of family influences on the child.

"Differences in Gifted and Nongifted Students and their Birth Order"

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CHAPTER 1

This chapter includes an introduction to the effects on intellectual development relative to the birth-order on children. The hypothesis, definition, and organization of the paper are also presented.

Introduction

In recent years research has been conducted to determine the effects of birth-order on a child. A child's sex, physical attributes, size of family, presence or absence of parents, and order of birth, all have effects on a child's development. Birth-order places a child into a special arrangement with the other members of the family. A child's birth-order in his family is both a structural and a processional variable (Albert, 1980). Family structure determines which family member will have the greatest effect on the child. As a process, birth-order helps determine the length and intensity of family influences on the child.

Marjoribanks and Walberg (1978) state that families establish different environmental experiences for children of differing positions. The first-born child receives more parental attention and verbal stimulation. This child also interacts more with adults. With each new sibling the environment changes. The child becomes a teacher as soon as a sibling is born. This teaching enhances the first child's

learning as it contributes another dimension to the learning experiences of subsequent siblings.

Most studies report comparisons between being first-born and high intellectual achievement (Pfouts, 1980; Altus, 1966). In Los Angeles, a two-year study was made of 561 highly gifted elementary students (Kincaid, 1969). Approximately one-half of the highly gifted students were first born. Background characteristics were also collected from 456 children who attended a summer program for gifted at Western Carolina University (Cox, 1978). In this study it was reported that almost half of the subjects were first-born.

There are many questions concerning birth order that remain unanswered. How does birth order affect the gifted child? Is birth order an influential determining factor in giftedness? Is birth-order relevant in identification procedures for special programs? What effect does birth-order have on a gifted child's social development?

Statement of the Problem

This study is concerned with how birth-order affects children identified for gifted programs. Differences between male and female, and children identified and not identified for gifted programs will be examined.

The following hypotheses were tested:

Hypothesis 1: There is no difference in birth-order for children identified for a gifted program in School System A and those children identified for a gifted program in School System B.

Hypothesis 2: There is no difference in birth-order for children identified for gifted programs and those not identified for gifted programs.

Hypothesis 3: There is no difference in birth-order between males and females identified for gifted programs.

Definitions

In this study the following terms will be used in the classification of ordinal positions. The identification procedures for the gifted in each school is also included.

Birth Order or Ordinal Positions

These terms refer to the order of birth in the family, (first child, second child, third child, etc.), in reference to entry level position or place within the family arrangement.

First-born Child

First-born refers to the first child born into a family. An only child is both a first-born and youngest child. This term will also be synonymous with first or only surviving child.

Middle Child

The middle child is a child with both older and younger siblings.

Youngest Child

The youngest child is the last child born in the family.

Later Born

The later born child is any child born after the first-born child.

School System A

The Renzulli Triad (three circle definition) is used in defining students for School System A's gifted program. The Renzulli Triad includes students who have high ability, creativeness, and task commitment. High ability is defined by Iowa Test of Basic Skills, group I.Q. test, and teacher nomination. By the use of a checklist of characteristics for task commitment, teachers and parents nominate students. Torrance Circle Creativity test is used in the identification of creativity.

School System B

School System B identifies students with high potential. Teachers nominate all students to be considered from classwork and observation. Secondly, the selected students complete the Torrance Circle Creativity Test. Finally, a Renzulli checklist (deals with characteristics in learning, motivation, leadership, communication) is completed on the top students from the Torrance Circle Creativity test.

Limitations of the Study

There are two limitations to this study.

1. A comparison of the two school's gifted and talented programs was drawn. The two schools use different identification procedures for their gifted.
2. Only two schools in a midwest state were used, reducing the generalizability to all gifted children. School System A represents a midwestern town area. School System B was basically in a midwestern rural area.

Organization of the Paper

This paper contains five chapters. Chapter 1 serves as an introduction to describe the problem, definition, and limitations of the problem. The review of literature is discussed in Chapter 2. Chapter 3 explains the method and procedures used in obtaining the survey. The results of the survey are contained in Chapter 4. Chapter 5 contains the discussion of results.

CHAPTER 2

Review of Literature

The purpose of this chapter is to review literature related to birth-order and how birth-order affects children and their development. Two main areas will be discussed: birth-order and the family, and birth-order and cognitive ability.

Birth-Order and the Family

The order of birth places the child into a special arrangement in the family structure. Each child has different environmental experiences due to differing positions in birth-order (Marjoribanks and Walberg, 1978).

Parent/Child Interaction

Researchers have reported differences in parent interaction with children of differing birth-order. Most studies report major differences with first-born children compared to those who were later born.

Hilton (1967) systematically observed mother-child interaction. The children, included in the sample, were approximately 4 years old. The investigation showed that the first-born child was significantly more dependent on the mother than those born later. Also Hilton's (1967) study established that mothers were more interfering, more extreme and more inconsistent in interactions with the first-born child. The later born child was allowed more time to handle situations by himself/herself.

Jacobs and Moss (1976) and Coehn and Beckwith (1976) also investigated mother-infant interaction. Both studies used naturalistic observation with modified time-sampling techniques. It was found that first-born's receive more parental attention and verbal stimulation (Coehen and Beckwith, 1976). Parents are more conscious of their verbal interaction with the first born than the later borns. Jacobs and Moss (1976) felt that the mother spent less time in social affections and caretaking interactions with the later born. These differences may be due to competition with older siblings. Also, the novelty and excitement of a child has diminished for parents and the mother is more efficient (Jacobs and Moss, 1976).

Additionally, first-born children receive the full force of a parent's standards, attitudes and values (Forer and Still, 1976). The later born child receives less direct parental pressure to live up to their ideals. Schachter (1963) determined that first-born children are more likely to fulfill parental goals and are over-represented in college enrollment.

Differential Sibling Development

Many variables affect each child's development, one of those is birth-order. The first born is trained to be the surrogate parent within the family structure. By teaching the younger siblings, the first-born enhances his/her own understanding or enhances personal understanding in the process (Pfouts, 1980). Pfouts (1980) also found that the first-born males (as a group) were serious, responsible, reserved, dependent, sensitive and competitive. However, later born males, as a group, were sociable, easy going, athletic, imaginative and

independent. The oldest sibling in a family is more mature in career decision-making than the middle or youngest child (Wilson, 1980; Bulter, 1980). Wilson's (1980) study also showed that first born's had significantly higher IQ's, but not higher GPA scores compared to other birth-order positions.

Family Size, Age Spacing

The size of the family and spacing between children are variables in every child's development. Zajonc and Markus (1978) found that intellectual performace decreases with birth-order, but only when there is close spacing between successive children. Belmont and Marolla's (1972) study determined that as family size increases, scores on the Raven Progressive Matrices declined, also as birth-order position became greater, the level of ability declines. The larger the intervals between children, the more negative effects of birth-order are diminished (Zajonc, 1976). However, studies done by Cicirelli (1967) and Schoonover (1959) determined that age spacing had no relationship with the level of intelligence.

Birth-Order and Cognitive Ability

This section synthesizes the findings of investigators concerned with relationships between a child's birth-order and the child's intelligence, achievement, and chance for attaining eminence.

Intelligence and Achievement

Most research has shown a linkage between birth-order and intelligence (Adams, 1980; Belmont and Marolla, 1973) and high intellectual achievement (Pfouts, 1980; Altus, 1966). First-born

children have higher IQ's (Burton, 1968) and higher verbal and number ability (Altus, 1966; Marjoribanks and Walberg, 1973). The high verbal ability is due to the fact that parents pay more attention to the first-born (Koch, 1954) and generally parents talk and interact more with the first-born during infancy (Rosen, 1961; Cohen and Beckwith, 1976; Jacobs and Moss, 1976). Zajonc and Markus (1975) felt that each additional child caused a poorer intellectual environment and thus a decrease in intellectual ability.

Burton (1968) in Project TALENT administered a battery of tests to 43,352 high school seniors from 1225 secondary schools to compare birth-order and intelligence. The Project TALENT measure is a composite score from three groups of test assessing reading comprehension, abstract reasoning, and mathematical aptitude. Mean intelligence scores were analyzed by sex and within each family socioeconomic position and each family size. Burton (1965) reported a slight superiority in intelligence of first-born over last born two, three, four, and five-child families.

A study by Belmont and Marolla (1972) included 400,000 19-year old men born in the Netherlands from 1944 to 1947. The men were all give the Raven Progressive Matrice. It was found that in most cases, the first-born scored better on the Raven than did the later borns.

The relationship between ordinal position, family environment, social status, and a set of mental abilities were examined for 185 11-year old boys (Marjoribanks and Walberg, 1975). Each boy was given the SRA Primary Mental Abilities Test

(1962, rev. ed.). The study found that earlier born children tended to have higher verbal and number scores, but ordinal position was not related to reasoning and spatial abilities. Even when differences in social status among families were controlled, the birth order differences in verbal and number abilities were significant.

Some research has also reported an existence of high achievement by the first-born. It has been found that the first-born child is over represented in college enrollments (Sampson, 1962; Schachter, 1963). Schachter (1963) studied birth-order data that was collected from all of the students taking the introductory course in psychology at the University of Minnesota. It was found that 50.2 percent of the students were first-born. Pfouts (1980) conducted a study which compared 37 pairs of brothers on the Slosson IQ Test. The first-born sons scored significantly higher on the Slosson IQ Test than did their younger brothers, they also noted that, when the second born scored significantly higher on the Slosson, their less able first-born brothers still did as well academically. Other studies found that birth-order and academic achievement are unrelated (Farley, 1967; Wolkon and Levinger, 1965).

Attainment of Eminence

Albert (1980) feels that transformation of early giftedness into adult eminence is one of the most enthralling and secretive processes of human development. There are many variables in a child's life that affect this transformation. One of these variables is birth-order. Biographical material was collected

on thirty-seven gifted persons, which showed eighteen of these were first born (Weiner, 1978). The first born included Beethoven, Handel, Einstein, Curie, Churchill, and Newton. Albert (1980) investigated the backgrounds of eminent people in politics and science. Seventy-two percent of American presidents were either the oldest son or became the oldest surviving son. Thirty-five percent of the British prime ministers were also oldest sons. In the field of science, Albert (1980) reported that thirty-eight percent of eminent scientists and forty-seven percent of competent researchers were oldest sons. Both studies concluded that an eminent person holds a special family position.

Summary

The literature indicates that a child's birth-order may affect that child's development. There is also strong indication that the experiences of a first born child are different from experiences of a later born child. Birth-order of the gifted child was not specifically addressed by any of the studies.

CHAPTER 3

METHODS AND PROCEDURES

This chapter will provide information regarding how data was acquired for this study. The instrument, subjects, and and design for data analysis are described.

The Subjects

Subjects were enrolled in two school systems in the mid-western section of the United States. School System A included 44 gifted students and 33 nongifted students from 1,050 K-6 students. School System B included 60 gifted students and 52 nongifted students from 350 K-5 students. School System B was basically in a midwestern rural area. School System A represented a midwestern town.

Instrumentation

A survey, developed by this writer, was utilized to collect data on the students. The survey requested the following information: (1) child's grade level, sex, birth-order, and age; (2) type of family organization of the child, the number of children in the family, and ages and ses of siblings; (3) special school programs in which the student and siblings were involved. (See Appendix A.)

Collection of Data

Two schools were used in the collection of data. A different procedure for collection was employed for each school system, due to differing preferences by building

administrators. The parents of the students completed the survey instrument.

An introductory letter, (See Appendix B), and an survey were provided for parents of School System A students. The gifted teacher delivered letters to students. The letters to the nongifted students were delivered by the building principal. The letters were distributed the week of November 15 through 19. The letters were to be returned by mail by November 26 in self-addressed envelopes.

In School System B, the names of gifted students and nongifted students were sent to the writer. The introductory letter, and survey were mailed to the parents on December 1. The instrument was to be returned by mail by December 17 in self-addressed envelopes.

Analysis of Data

Differences between birth-order of students were analyzed using the Chi-square formula: (Edwards, 1972)

$$X^2 = \frac{(Fi - fi)^2}{Fi}$$

Summary

This study utilized 60 gifted and 52 nongifted students in two school systems in the midwest. Information on birth-order, family organization, and family size were obtained through the survey. Data was analyzed using a chi-square formula.

CHAPTER 4

RESULTS OF THE STUDY

This chapter includes demographic data collected from the survey and statistical analysis of hypotheses tested.

Results

The following three hypotheses were tested by using the Chi-Square formula.

Hypothesis 1: There is no difference in birth-order for children identified for gifted programs in School System A and those children identified for gited programs in School System B.

A Chi-square, $X^2(2) - 3.93 > .05$, was found. No significant differences were found between the two gifted programs. Table 1 shows the frequency of birth-order for gifted students for each school. Hypothesis 1 was accepted.

Hypothesis 2: There is no difference in birth-order for children identified for gifted programs and those not identified for gifted programs.

A Chi-square, $X^2(2) = .32$ at the .05 level of significance was found. No significant difference in birth-order was found between students in gifted programs and those not in gifted programs. Table 2 shows the frequency of gifted and nongifted students. Hypothesis 2 was accepted.

Table 1

Comparison of Birth-order in School Systems

Group	First-born	Middle	Youngest
School System A Gifted	24	4	16
School System B Gifted	5	4	7

Table 2

Birth-Order of Gifted and Nongifted Students

Group	First-born	Middle	Youngest
Gifted	29	8	23
Nongifted	24	9	19

Hypothesis 3: There is no difference in birth-order between males and females identified for gifted programs. The result using a chi-square, x^2 (2) = .33 > .05, was found. There is no significant difference in birth-order between males and females identified for gifted programs. Table 3 shows the frequency of male and female gifted students. Hypothesis 3 was accepted.

Table 3

Birth-Order of Male and Female Gifted Students

Group	First-born	Middle	Youngest
Male, Gifted	13	3	11
Female, Gifted	16	5	12

Additional Findings

The demographic section of the survey instrument revealed additional information.

Parent arrangement for gifted and nongifted is presented in Table 4. Ninety-three per cent of gifted students came from two-parent families compared to sixty-three per cent of nongifted students which came from two-parent families. Three per cent of gifted students came from families with one parent and one step-parent. While twenty-nine per cent of nongifted students came from families with a step-parent. Less than ten per cent of gifted or nongifted students came from a single parent family. Therefore, no significant difference was found in family organization or number of children in family for gifted and nongifted students.

Table 4

Parent Arrangement

Type of Family	Gifted Students	Per Cent	Nongifted Students	Per Cent
Two-parent family	56	93	33	63
One parent, one step-parent	2	3	15	29
Single-parent, due to death	1	2	1	2
Single-parent due to divorce	1	2	3	6

The number of children in each family is indicated in Table 5. Seventy-seven per cent of gifted or nongifted students came from two- or three-children families. One-, four- or five-children families each represented ten per cent or less of the population.

Table 5

Family Size

Number of Children	Gifted	Per Cent	Nongifted	Per Cent
One	4	7	3	6
Two	28	47	25	48
Three	18	30	15	29
Four	6	10	5	10
Five	4	7	4	8

CHAPTER 5

Summary

The purpose of this paper was to determine if birth-order had an effect on children identified for gifted programs. This chapter will summarize the procedures and results of the study. The conclusion and recommendations will also be included.

Two schools in a midwestern state were used to collect data on birth-order. Parents of 60 gifted and 52 nongifted students were asked to fill out a survey on their child. The survey requested the following information: (1) child's grade level, sex, birth-order, and age; (2) type of family organization of the child, the number of children in the family, ages and sex of siblings; (3) special school programs in which the student and siblings were involved (See Appendix A).

The following hypotheses were tested:

Hypothesis 1: There is no difference in birth-order for children identified for gifted programs in School System A and those children identified for gifted programs in School System B.

Hypothesis 2: There is no difference in birth-order for children identified for gifted programs and those not identified for gifted programs.

Hypothesis 3: There is no difference in birth-order between males and females identified for gifted programs.

Data was analyzed using the Chi-square formula (Edwards, 1972). No significant differences were found for any of the three hypotheses at the .05 level.

Conclusions

The children identified for gifted programs in School System A and B were not affected by birth-order. Both school systems used teacher nominations, checklists, and the Torrance Circle Creativity Test in the identification procedures. Iowa Test of Basic Skills, group I.Q. test, and parent nomination were also part of the identification in School System A. Even though School System A used additional instruments in identification, no measured differences were found between birth order for gifted students in the two schools.

The majority of the children came from a nautral two-parent family with one or two siblings. The subjects were all white, and came from middle class homes. The students lived in a midwestern state, either in a rural or town setting (population 9,000 or less).

Birth-order seems to have a greater effect in larger families. Studies by Zajonc and Markus, (1978) and Belmont and Marolla (1972) found that intellectual performance decreases with birth-order. The trend, today, is for smaller family size toward two children which diminishes some birth-order effect. With the more common two-child family, the child is either first-born or last-born which are more favorable positions than middle born. Also with two children the adult interactions are more evenly divided than in larger families where interaction gradually diminishes from first born to last born.

It was difficult to determine if birth-order had a greater effect in a single-parent family due to the lack of this type of subjects in the study. Information regarding existed differences between children who lost a parent due to death and children who lost a parent due to divorce was not investigated in this study.

Recommendations

Further research on birth-order of gifted children with a larger population, which would include children from more diverse backgrounds is needed. The research including children from different regions in the United States might indicate some regional differences. These regions could be geographical, economical, urban, rural, or ethnic. Other variables might include students by race (i.e. white, Black, Indian, other) in a particular geographical region. These students would be compared with each other within the region and also compared with students in another geographical region by ethnic membership.

Research could be done to see if children identified for gifted programs fall into socio-economic patterns. The socio-economic patterns would include class structure due to income, level of education of parents, or type of occupation. The level of parental education and/or income of gifted students would be analyzed to determine whether those socio-economic patterns play a role in giftedness of a child. This study should also be done in a certain region with the results from another region compared.

Research which deals with family arrangement of a gifted child may be conducted. This research would include parent arrangement (two-parent, one-parent and step-parent, single-parent due to death or divorce, unwed mothers, foster parents, etc.). The number of siblings, age-spacing, sex of siblings, or death of siblings should also be included. The research might determine if one type of parent arrangement seems to have a greater number of children identified for gifted programs. Also if children with specific sibling characteristics tend to be identified more for gifted programs.

Further studies on birth-order of gifted children may lead to insights to a better understanding of giftedness. Studies may also lead to general characteristics which may be used in identification procedures.

Appendix A

Grade level _____

Please check ( ) the appropriate answer regarding your child.

1. Sex: _____ female
   _____ male

2. Birth order: _____ First child
   _____ Middle child
   _____ Youngest child

3. Family Organization: _____ Single parent family (one member deceased)
   _____ Single parent family (divorced)
   _____ Two-parent family
   _____ Two-parent family (with a step-pare

Please complete the questions by filling in the blank.

1. Age: _____ years _____ months

2. Number of children in family: _____

3. Ages and ses of brothers or sisters:
   Example: girl-4 years

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4. Special school programs in which your _____ grade child is involved.

   _____ Music (chorus, band)
   _____ Art
   _____ Learning disabilities
   _____ High Achievement
   _____ Other (please specify name of program.)

5. Programs in which the child's brothers or sisters are involved.

   _____ Music (chorus, band)
   _____ Art
   _____ Learning disabilities
   _____ High Achievement
   _____ Other (please specify name of program.)

Appendix B

Dear Parents:

Your help and cooperation is appreciated.

I am conducting a survey which compares the birth order of different groups of students. I am a teacher at New Hampton Elementary and currently working on a master's degree in the Department of Curriculum and Instruction. This survey is for my research paper which is a requirement of the Master's Degree program at the University of Northern Iowa.

Would you please take a few minutes to answer the enclosed questionnaire and return it to me in the self-addressed, stamped envelope which has been provided?

The data gathered is confidential. To insure anonymity, no name is required on the questionnaire. If you have any questions, please feel free to contact me (515-394-4438).

I would appreciate the return of this information by November 26.

Thank you for your contribution to this study.

Sincerely,

Linda Meyer

Enclosure

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