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A descriptive study of birth order and testing during the middle school years

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A DESCRIPTIVE STUDY
OF BIRTH ORDER AND TESTING
DURING THE MIDDLE SCHOOL YEARS

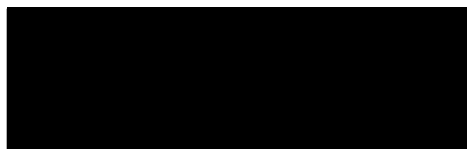
MASTER'S THESIS

Submitted to the Department of Elementary Education,
University of Dayton, in Partial Fulfillment
of the Requirements for the Degree
Master of Science in Education

by

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University of Dayton
Dayton, Ohio
July, 1997

Approved by:



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Official Advisor

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DEDICATION

To my parents for their constant support of my continuing education.

To my sister, Staci, for keeping me company in the library.

To my aunt, Jackie, for proofreading my thesis.

CHAPTER I

INTRODUCTION

Purpose for the Study

Hillary Clinton, Clint Eastwood, Steve Forbes, and Oprah Winfrey have something in common besides being celebrities. They are first born children. They are achievers who know what they want and know how to get it. Michael Jordan, David Letterman, Madonna, and Bill Gates are also celebrities and achievers, yet they are later borns. These later born rebels have chosen to excel by following different paths than their older siblings (Crowley, 1996).

"Birth order" focuses on the order in which one is born into a family (Feder-Feitel, 1997). It provides a framework into which other factors are incorporated. A person's behavior is shaped by birth order and is intensified by stressful experiences (Isaacson, 1997). The birth order literature reveals many contradictory findings; however, the majority of the literature classifies birth order into three categories: first born, middle born, and last born. The exceptions are Sulloway

(1996), who classifies birth order into two categories: first born and later borns, and Isaacson (1997), who classifies birth order into five categories: only children, first born, second born, third born, and fourth born.

Each birth order position has its own unique characteristics. The first born child has been extensively studied. First born children tend to be leaders. Proof of this lies in the fact that half of America's presidents, including Bill Clinton, are the oldest child in their family. Of the first twenty-three U. S. astronauts in space, twenty-one were first borns (Feder-Feitel, 1997). The oldest sibling usually appreciates order, rules, and structure. It is also typical for the first born to be responsible and comfortable with power (Nyman, 1994).

The middle born sibling is often the neglected sibling. It is usually the only birth position to be described as neglected/overlooked (Nyman, 1994). As a result of this overlooked position, middle children rely on friends for support; therefore, middle children are especially loyal friends (Feder-Feitel, 1997). A middle born child is also the family peacemaker. Middle children tend to go in the opposite direction of the first born. Characteristics that are identified with the middle birth

position include: sociableness, thoughtfulness, responsibility, ambition, and independence.

Last born children are often referred to as the "babies." Babies tend to be class clowns in school (Feder-Feitel, 1997). They also can be rebels. This rebelliousness is due to the fact that many of the roles in the family have already been filled by the time the "last borns" have come along (Feder-Feitel, 1997). The youngest child is completely comfortable being the center of attention. The baby is usually friendly and outgoing, but can also be manipulative with older siblings (Parks, 1995). "Youngest" children are often characterized negatively and therefore are many times described as spoiled, dependent, irresponsible, rebellious and immature (Nyman, 1994).

The more an educator knows about a child, the better chance the educator has to reach that child. Many times a rebellious younger child will baffle teachers who have had the achieving older siblings. A perfectionistic older sibling and a rebellious younger child is a common scene. By studying the traits attributed to birth order, educators can gain some useful insights to help them reach their students. Armed with the knowledge that first borns are characterized as achievers and

that family “babies” tend to be rebellious, the teacher can begin to take steps to match a personal response to the unique behavior of each student. One might have more success responding to a first born with, “ You may not agree with this, but...” whereas a last born might respond better to, “ This may be hard for you to understand, but...” this type of “response knowledge” comes from studying birth order (Isaacson, 1997). These identified personality traits may have some effect on a child’s education, and may specifically affect the testing that is used in assessing children.

Problem Statement

The purpose of this study is to analyze how a child’s birth order affects the child’s achievement test scores and proficiency test scores that were administered during the child’s middle school years.

Research Questions

How does a child’s birth order affect the results of an achievement test, the Iowa Test of Basic Skills?

How does a child's birth order affect the results of a proficiency test, the Ohio Proficiency Test?

Assumptions

In order to conduct this study, the author needs to make several assumptions. First, the author will assume that the testing instruments, the Iowa Test of Basic Skills and the Ohio Proficiency Test, are reliable in that they measure the skills that they are intended to measure. Second, the author will assume that the birth order information gathered from the subjects is accurate.

Limitations

There may be several limitations to this study. One of the limitations of this study may be the fact that the author used a non-probability sample, which will limit the author's ability to make generalizations. Another limitation of this study may be that no formal statistical analyses were done. Instead the author used simple mean comparison of gender groups and these results may not be reflective of real significant differences. Another limitation of this study may be that all

the students involved in this study will be from a limited geographical area within the state of Ohio. The third possible limitation may be that the terminology, "birth order," might be interpreted as chronological birth order as opposed to psychological birth order. The fourth possible limitation may be the contradictory findings in the birth order literature. The final limitation of this study may be the variations that exist in the testing conditions.

Definition of Terms

Chronological birth order is the order in which one is born into a family.

Psychological birth order refers to the fact that the birth order characteristics tend to start over when there exists a large age difference of five or more years between siblings.

Iowa Test of Basic Skills is an achievement test which measures the growth of skill in vocabulary, reading, the mechanics of writing, methods of study, and mathematics.

Ohio Proficiency Test is a test that determines whether students are proficient for their grade level in the five subject areas: reading, writing, citizenship, mathematics, and science.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

The following review of literature focuses primarily on the ideas and research of Clifford Isaacson, Kevin Leman, and Frank Sulloway.

Clifford Isaacson

With the recent trend of evaluating schools on their standardized test scores, teachers need to maximize their ability to help their students. This may be achieved by gathering substantial information about each child. The strategies that work with a first born child may not be the strategies that work with a later born child. The birth order of a child is a factor that does not seem to be considered in the school setting. Understanding birth order will not necessarily enable a teacher to manipulate other people, or even to predict human behavior, but it is the knowledge that may help teachers to understand better human behavior (Isaacson, 1988). According to Isaacson (1988), birth order effects are the behaviors of people based on birth order position. He believes that these effects develop as coping strategies that a

child uses to feel okay about his/her particular position in the family. Isaacson further clarifies this when he states that children develop birth order strategies for coping with siblings rather than in response to parents. Except for the first born and the only child, children's birth order characteristics develop by coping with the next older child. Isaacson explains that although birth order effects appear to be set by age five, in some instances, birth order characteristics may even be established by age two or three.

Isaacson approaches birth order from a counseling perspective. His beliefs about birth order have been formed through his counseling experience as a Methodist minister. Isaacson classifies birth order into five positions. They are first born, second born, third born, fourth born, and the only child. Furthermore, he states that in large families the birth order starts over with the fifth, the ninth, and the seventeenth child. Isaacson believes that understanding birth order is the key to understanding human behavior.

According to Isaacson's research, the first born child may decide that he/she has to earn love to be loved, especially after the birth of a sibling. The first born believes that love is

conditional upon his/her behavior rather than unconditional.

Isaacson explains that this child will tend to believe love is only available on a limited basis. This, in turn, encourages the first born to experiment with different ways of getting attention and doing something to win approval often works better than anything else. Therefore, the child had earned the love, and love that is earned takes the form of approval, admiration, and respect.

Isaacson states that the second born child has to cope early in life with a "first born's" attempts to impress the parents. He further explains that the second born child can easily feel inadequate because he/she cannot do as well as the first born child. Furthermore, the second born cannot cope with the first born's behavior by reasoning that competence will come with age. According to Isaacson, to deal with this feeling of inadequacy, second born children usually choose a strategy of perfectionism. However, this child usually selects a restricted area in which to attempt perfection. This perfectionism is often overlooked because it doesn't extend to every area of life. Second born children can deal with the feeling of inadequacy at the expense of others. They may

withhold compliments which would allow others to take pride in their performance, and give criticism, correction, and suggestions that highlight the inadequacy of others' achievements. Because second borns strive for perfection, they prefer logic over feelings.

The third born child develops birth order strategies to defend against the second born's attempts to pass on the feeling of inadequacy. According to Isaacson, these strategies are usually developed by the third born within the first five years; in fact, he notes that they often can be developed in the first two or three years. Isaacson explains the second born's attempts to pass on the feeling of inadequacy are usually unsuccessful. Rather than feeling inadequate, the third born tends to feel vulnerable. Through ridicule, the second born seems able to make the third born uncomfortable, almost at will. However, the third born can ignore the taunts, put downs, and ridicule of the second born and this enables the third born to feel stronger. The third born refines and develops his/her birth order strategy by becoming fearless. While the third born is able to eliminate much fear, he/she is unable to eliminate fear completely. Isaacson clarifies that in situations

where fear remains, the third born will usually avoid whatever causes the fear. If a third born is pushed into doing something he/she fears, the third born may translate the fear into anger before doing the feared activity. The fearlessness of the third born child can make this child difficult for adults to control.

This is proved by the fact that a disproportionate percentage of youth who get into trouble appear to be third borns.

Unfortunately, this child may also be drawn to non-achieving children rather than "peer achievers" of whom the parents would approve. Furthermore, Isaacson explains that third borns have a strong sense of empathy for weak and helpless persons with whom they tend to identify.

Isaacson states that when a fourth born arrives in this world, he/she already has three older siblings. Of these siblings, the third born is going to have the greatest impact on the fourth. The third born would like to transfer the feeling of vulnerability to the fourth born. This attempt usually occurs when the fourth born is old enough to play with the other children. The third born tells the fourth born that he/she is not old enough, big enough, and fast enough to join the other children. This encourages the fourth born to perceive that

he/she is immature. Isaacson cautions that the fourth born person, who has decided he/she will never be grown up, may appear to be unable to grow up. He also explains that the fourth born person may have trouble understanding that a person can be mature and do things the easy way at the same time. Furthermore, fourth borns tend to feel used when they are asked to do something. Many times a fourth born will protect him/herself and will stop listening when someone says something they do not want to hear. Isaacson notes that in a family of more than four children, the fourth born usually tries to pass on the feeling of being left out by ignoring the fifth born. This has the effect of starting the birth order over again with the fifth child.

According to Isaacson, an only child develops birth order characteristics while trying to avoid excessive attention from the parents and while playing alone without the company of siblings. Many times an only child likes to be left alone. Isaacson notes that in order to deal with parental intrusion, an only child may develop fast and slow speeds for doing things. This child develops a fast speed in order to finish projects before others can interfere with them. This child also

develops a slow speed for giving other the opportunity to help get the task done. This, in turn, sets the child up for a lifetime of doing pleasant tasks quickly and unpleasant tasks slowly, which make life seem to be a lot of work without much fun. Isaacson makes the point that the only child is often unable to separate work from play. The only child appears to be a perfectionist, but this child does not focus on details, as does the second born, but on the larger picture. Furthermore, the only child resents criticism and may even avoid doing the behavior which was criticized. At home the only child feels smothered by all the parental attention; however, at school the child escapes and discovers a world with normal attention and easier relationships. Consequently, this is a reason that only children like school--it is an escape. Only children will tend to ignore the feelings, attitudes, and thoughts of others and this makes them appear to be self-centered.

Isaacson believes that birth order consultants may one day enable teachers to teach more effectively. He explains that through understanding the birth order characteristics of their children, teachers may be able to help each child individually according to his/her ways of coping. He also points out that a

teacher may learn to like children whom he/she had disliked because of birth order differences. Finally, he claims that by recognizing the birth order differences, a teacher may be able to motivate children much more effectively than his/her birth order position would normally allow.

Kevin Leman

Kevin Leman (1985), author of the book, The Birth Order Book, Why You Are The Way You Are, gives four reasons why the study of birth order is important. They are:

1. The most intimate relationships we ever have in life are with our families.
2. For a young child growing up, there is no greater influence than his or her family.
3. The relationship between parents and children is fluid, dynamic and all important. Everytime another child is born, the entire family environment changes.
4. We don't spend enough time being aware of just how our branch fits in the family tree (pp.16-17).

Leman classifies the birth order positions into first born, the middle children, and the family baby. Leman has provided a list of characteristics for each birth order position. They are as follows:

First borns are typically: perfectionistic, reliable, conscientious, list makers, well-organized, critical, serious, and scholarly. Middle children are typically: mediators, fewest pictures in the family photo album, avoid conflicts, independent, extremely loyal to the peer group, mavericks. The babies are usually: manipulative, charming, blame others, show off, people person, good salesperson, precious, and engaging (p.11).

Leman asserts that in most books about birth order, the first borns usually get more than their share of coverage. He further states that it is not too surprising because they usually get more ink in the write ups of life (e. g., press coverage in newspapers). He explains that this is because they are often the achievers. Leman warns that although first borns are generally characterized as organized, over parented, overprotected, pressured to perform, achievers, conservative, and wanting control, classification of the first borns is not always so simple. He believes there are two basic types of first borns. They are the compliant and wanting to please first born and the strong willed and aggressive first born. The compliant first born is typically the model child who wants to please others. These first borns are reliable and tend to be good students. Their need for approval is strong, so when they are

asked to do something they do it. The strong willed first borns are more assertive than the compliant first borns. This first born is usually a high achiever and a hard driver. These first borns have very high expectations and need to be in charge. This hard driving first born is proud of the way he gets things done.

First borns have achieved a great deal. Many go on to positions of leadership. A majority of the United States presidents have been first borns while only four have been babies. First borns have confidence that people will take them seriously. Being a first born does have a downside because with all the attention comes tremendous pressure. First borns are usually disciplined more strictly than any other siblings.

Leman includes "only children" in the group of first borns. He calls them super first borns. According to Leman, only children tend to be critical of others and themselves. Only children often have trouble relating to peers because of adult attention. Sometimes only children can be very pampered and spoiled. Furthermore, many only children have a lifelong problem with self-centeredness.

Leman's group of middle children includes any child born

between the first born and the last born. Middle children usually feel that they were born too late to receive the first born privileges and special treatment. The middle children also feel they were born too soon to strike the bonanza that many last borns enjoy. Leman notes that the characteristics of middle children are filled with contradictions. The middle child usually chooses another direction from the older sibling. If the first born is compliant, then the second born might be a behavioral handful. Middle children rely on their peer group for recognition and love.

Family babies are typically outgoing and charming. They are also affectionate, uncomplicated, and absentminded. Due to these characteristics last born children deal with not being taken seriously by their family and by the world.

Frank Sulloway

Sulloway (1996), the author of Born to Rebel, classifies birth order into two positions, firstborns and laterborns. Sulloway reinforces Leman's and Isaacson's work by stating that firstborns are reported to be more responsible and achievement oriented than laterborns, who are in turn reported to be more socially successful than their older

siblings. Sulloway notes that Alfred Alder (1927), claimed that if firstborns are unable to regain parental favor after the birth of a second child, they sometimes rebel. He explains that first borns enjoy the advantages of being bigger, stronger, and smarter than their younger siblings. Consequently, the first borns feel more self assured than laterborns. Sulloway explains that firstborns are likely to try to minimize the costs of having siblings by dominating them. Sulloway concurs that firstborns are more self-confident than later borns and that they are over represented among political leaders, including American Presidents.

Emotionally, he also explains that firstborns have more reason than laterborns to be jealous of their siblings. Firstborns begin life with 100 percent of parental investment. However, laterborns who share parental investment from the beginning, the reduction in parental care owing to a new sibling is never suffered to the same degree as the first born. Sulloway defends the literature on birth order is consistent with these expectations. He claims that firstborns are more anxious about their status. Sulloway also notes that first borns are more emotionally intense than laterborns and slower to

recover from upsets. Sulloway states that laterborns are more inclined than firstborns to question authority and to resist pressure to conform to a consensus. He also explains that laterborns are more risk oriented than firstborns.

According to Isaacson (1988), Leman (1985), and Sulloway (1996), birth order is an influential factor that can give educators substantial knowledge about students. Each of these researchers classifies birth order differently; however, they agree on many characteristics associated with the birth positions. Each mentions that the first born children are achievers and that they need approval. They further concur that those born after the first borns must deal with the first born trying to retain the parental attention. Sulloway explains that first borns enjoy the advantages of being bigger, stronger, and smarter than their younger siblings. Consequently, the first borns feel more self assured than laterborns. While they differ on exactly how to classify the various birth positions, they agree on the importance of the study of birth order in counseling and education.

CHAPTER III

PROCEDURE

Purpose

The purpose of this study is to analyze how a child's birth order affects the child's achievement test scores and proficiency test scores that were administered during the child's middle school years.

Subjects

The students who participated in this study were eighth graders. They were enrolled in the same school since the beginning of their fifth grade year. The subjects also lived within the same school district, and none could be classified as open-enrollment students.

Setting

School -The school that the subjects attended was located in southwest Ohio. The school housed kindergarten through

eighth grade students, and the total enrollment was around 340 students. The school was one of three elementary/ middle schools in the school district, and these three schools merged into one high school.

Community -The community in which the school is located consisted of households that have both parents working, many who have professional careers. The community played a very active role within the school. The parents ran an active parent volunteer program and a profitable parent teacher organization.

Data Collection

Construction of the Data Collecting Instrument- The data collecting instruments that the author used in this study were the Iowa Test of Basic Skills and the Ohio Proficiency Test. The author has organized the data by birth order and by test to find out if any patterns existed. The author accessed this information from three data sources: the students' accumulative folders, the school guidance counselor, and the

school principal.

Administration of the Data Collecting Instrument-The

administration of the tests had already taken place for all the students involved. The Iowa Test of Basic Skills was given to the subjects as seventh graders. The Ohio Proficiency Test was given to these subjects as eighth graders. The tests were administered under strict guidelines according to the test directions. The time limits were observed, and the test administrators did not provide the students with assistance on content-related questions.

CHAPTER IV

RESULTS

Presentation of the Results

The author divided the subjects into two groups, "first borns" and "later borns", and then compared the test results of the participants on the two tests. The author then sub-divided the two subject groups into gender groups of male and female, and compared the test results of each test. The author compiled this data on five tables which can be found in the appendices.

Discussion of the Results

The author first compared the Iowa Test of Basic Skills results in relation to first born versus later born. The author derived the mean of the three areas: standard score (SS), percentile rank (PR), and stanine (S). When the author compared the first borns to the later borns, the mean comparisons showed that on the reading and math portions of the Iowa test the first born group scored slightly lower than the later born group. However, on the language portion of the test the first born group scored slightly higher than the later

born group. (See Appendix A)

When comparing the Ohio Proficiency Test, the author derived the percentage of subjects passing the test, and then compared those results according to birth order. The first borns and later borns had 100 percent of the sample passing the writing and reading tests. On the math and citizenship tests, the first born group had 94 percent passing, while the later born group had 92 percent passing. On the science portion of the test the first born group had 94 percent passing while the later born group had 100 percent passing. Simple mean comparisons suggest no differences. More sophisticated statistical procedures are needed to determine if any "real" differences exist.

The author then compared the Iowa Test of Basic Skills results of the first born males and the later born males in the sample. On the reading and language portions of the test, the first born males averaged higher scores (their mean scores) than the later born males. On the math portion of the test, the later born males slightly edged out the first borns. (See Appendix B)

On the Ohio Proficiency Test, the first born males and the

later born males both had 100 percent passing on the writing, reading, and science tests. The first born males only had 92 percent passing the math and the citizenship tests, while the later borns had 100 percent passing. More sophisticated statistical tests are needed to assess the performance differences.

The author then compared the Iowa Test of Basic Skills results between the later born females and the later born males. On the reading and language portions of the test the later born females edged out the later born males. However, on the math portion of the test the males performed better. (See Appendix C)

On the Ohio Proficiency Test, the later born males and females had 100 percent passing on the writing, reading and science tests. The later born males also had 100 percent passing in math and citizenship, while the later born females had 88 percent passing on the math and citizenship tests. Once again, more sophisticated statistical tests are needed to assess the performance differences.

The next group that the author compared were the first born females and the later born females. On the Iowa Test of

Basic Skills, the first born females outscored the later born females on all three tests (i.e. they had higher mean scores). (See Appendix D)

On the Ohio Proficiency Test, the first born females had 100 percent passing on all five tests, while the later borns had 100 percent passing on three of the five tests and 88 percent passing on the math and citizenship tests.

The final groups that the author compared were the first born females and the later born males. On the Iowa Test of Basic Skills, the first born females on average scored higher on the reading and language tests while the later born males on average scored a bit higher on the math portion of the test. (See Appendix E)

Both the first born females and the later born males had 100 percent passing on all five parts of the Ohio Proficiency Test.

Looking back at the various results, the following conclusions could be made about this sample. The later borns who participated in this study do well in mathematics. In all comparisons, except for Appendix D, the later borns' mean score was higher than the first borns. The first borns in this

study do well in language. In all comparisons with first borns they achieved a higher mean score than the later borns. In conclusion, the author found no significant differences that could be applied to other groups.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Birth order is the order in which one is born into a family(Feder-Feitel, 1997). It provides a framework into which other factors are incorporated. A person's behavior is shaped by birth order and is intensified by stressful experiences (Isaacson, 1997). Each birth order position has its own unique characteristics. The first born child has been extensively studied (see Sulloway, 1996). First born children are leaders. The middle born sibling is often the neglected sibling. It is usually the only birth position to be described as neglected/ overlooked (Nyman, 1994). As a result of this overlooked position middle children rely on friends for support middle children are especially loyal friends (Feder-Feitel, 1997). "Last born" children are often referred to as the "babies." Babies tend to be class clowns in school (Feder-Feitel, 1997). They also can be rebels. As an educator the more one knows about a child the better chance the educator has to

reach that child. By studying the traits attributed to birth order, educators can gain some useful insights to help them reach their students. Armed with the knowledge that first borns are characterized as achievers and that family "babies" tend to be rebellious, teachers can match their response to the students. For example, an only child is more likely to respond to "I don't know about you but..." whereas a fourth born is more likely to respond to "This may be hard for you to believe, but...".

The purpose of this study was to analyze how a child's birth order affects the child's achievement test scores and proficiency test scores during the child's middle school years.

The students used in this study were eighth graders from a school located in southwest Ohio, a school that housed kindergarten through eighth grade students. The author gathered the test scores and accessed the students' accumulative folders to determine the birth order of each student. The data collection instruments used in this study were the Iowa Test of Basic Skills and the Ohio Proficiency Test.

Most of the research by Isaacson (1988), Leman (1985), and Sulloway (1996) indicates that first borns are achievers;

the author believed that the first born students in the sample would achieve higher scores on the tests; the results of this study suggest that when the test scores of the first borns and the later borns were compared the first borns did, in fact, do better on the language portion of the Iowa Test of Basic Skills, while the later borns performed better on the reading and math portions. The only group to achieve higher in all areas was the first born females compared to the later born females. In fact, the later borns achieved quite well on all the tests.

Conclusions

The author has learned a great deal about birth order and testing, and has applied much of the birth order knowledge to her personal and professional life. The information has enabled the author to develop a better understanding of many students that have baffled her in the past. In fact, two students come to mind. They were brother and sister. The brother was the fifth child of six and he definitely fits into Isaacson's description of the fifth child (a.k.a. another firstborn). His sister was the third child of the six. She exhibited many of the third born characteristics described by Isaacson; however, she

also exhibited some of the first born qualities. The author believes that the first born qualities were due to the fact that she was the only female of the siblings. With the birth order knowledge the author might have been a more effective teacher with each of these siblings. As the author was doing the research for this study, she found many of her friends, family, and colleagues fit into the various birth order classifications. As a first born herself, the author realized all her close friends are later borns and most are the family babies. The author also realized as a child of two middle born children, that only one parent fits into Leman's description of the middle children. The author has also discovered the birth order of everyone that she is in daily contact with and she was amazed how the classifications fit so many people.

Recommendations

As an educator, the author recommends using birth order knowledge to understand learners. As Clifford Isaacson (1988) asserts, "understanding birth order will not necessarily enable you to manipulate other people, or accurately predict human behavior but the knowledge may help you to understand

human behavior" (p.2). As an educator, it is the duty of the teacher, counselor, and principal to access as much information on a student as possible. This will enable the educator to help each student to the best of her ability.

Appendices

Appendix A

First Born and Later Born Performance Data

IOWA TEST OF BASIC SKILLS

	READING			MATH			LANGUAGE		
	MEAN	RANK	STANINE	MEAN	RANK	STANINE	MEAN	RANK	STANINE
FIRST BORN	157	63 %	6	164	78 %	7	167	75 %	7
LATER BORN	164	70 %	7	167	81 %	7	166	73 %	7

OHIO PROFICIENCY TEST

	WR	RE	MA	CI	SC
FIRST BORN	100	100	94	94	94
LATER BORN	100	100	92	92	100
KEY					
WR=WRITING					
RE=READING					
MA=MATHEMATICS					
CI=CITIZENSHIP					
C=SCIENCE					

Appendix B

First Born Males and Later Born Males

Performance Data

IOWA TEST OF BASIC SKILLS

	READING			MATH			LANGUAGE		
	MEAN	RANK	STANINE	MEAN	RANK	STANINE	MEAN	RANK	STANINE
FIRST BORN MALES	164	70 %	7	167	81 %	7	166	73 %	7
LATER BORN MALES	159	61 %	6	168	84 %	8	163	72 %	6

OHIO PROFICIENCY TEST

	WR	RE	MA	CI	SC
FIRST BORN MALES	100	100	92	92	100
LATER BORN MALES	100	100	100	100	100
KEY					
WR=WRITING					
RE=READING					
MA=MATHEMATICS					
CI=CITIZENSHIP					
SC=SCIENCE					

Appendix C

Later Born Females and Later Born Males Performance Data

<u>IOWA TEST OF BASIC SKILLS</u>									
	READING			MATH			LANGUAGE		
	MEAN	RANK	STANINE	MEAN	RANK	STANINE	MEAN	RANK	STANINE
LATER BORN FEMALES	166	75 %	7	166	79 %	7	167	65 %	7
LATER BORN MALES	159	61 %	6	168	84 %	8	163	72 %	6
<u>OHIO PROFICIENCY TEST</u>									
	WR	RE	MA	CI	SC				
LATER BORN FEMALES	100	100	88	88	100				
LATER BORN MALES	100	100	100	100	100				
KEY									
WR=WRITING									
RE=READING									
MA=MATHEMATICS									
CI=CITIZENSHIP									
SC=SCIENCE									

Appendix D

Later Born Females and First Born Females Performance Data

<u>IOWA TEST BASIC OF SKILLS</u>									
	READING			MATH			LANGUAGE		
	MEAN	RANK	STANINE	MEAN	RANK	STANINE	MEAN	RANK	STANINE
LATER BORN FEMALES	166	75 %	7	166	79 %	7	167	65 %	7
FIRST BORN FEMALES	168	80 %	7	167	86 %	7	181	92 %	8
<u>OHIO PROFICIENCY TEST</u>									
	WR	RE	MA	CI	SC				
LATER BORN FEMALES	100	100	88	88	100				
FIRST BORN FEMALES	100	100	100	100	100				
KEY									
WR=WRITING									
RE=READING									
MA=MATHEMATICS									
CI=CITIZENSHIP									
SC=SCIENCE									

Appendix E

First Born Females and Later Born Males

Performance Data

<u>IOWA TEST OF BASIC SKILLS</u>									
	READING			MATH			LANGUAGE		
	MEAN	RANK	STANINE	MEAN	RANK	STANINE	MEAN	RANK	STANINE
LATER BORN MALES	159	61 %	6	168	84 %	8	163	72 %	6
FIRST BORN FEMALES	168	80 %	7	167	86 %	7	181	92 %	8
<u>OHIO PROFICIENCY TEST</u>									
	WR	RE	MA	CI	SC				
LATER BORN MALES	100	100	100	100	100				
FIRST BORN FEMALES	100	100	100	100	100				
KEY									
WR=WRITING									
RE=READING									
MA=MATHEMATICS									
CI=CITIZENSHIP									
SC=SCIENCE									

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