Birth Order and Self-concept: Their Relationship to Reading Achievement

Laurie Maryjanowski Penepent

Follow this and additional works at: https://digitalcommons.brockport.edu/ehd_theses
Part of the Language and Literacy Education Commons, and the Secondary Education Commons

To learn more about our programs visit: http://www.brockport.edu/ehd/

Repository Citation
https://digitalcommons.brockport.edu/ehd_theses/828

This Thesis is brought to you for free and open access by the Education and Human Development at Digital Commons @Brockport. It has been accepted for inclusion in Education and Human Development Master’s Theses by an authorized administrator of Digital Commons @Brockport. For more information, please contact kmyers@brockport.edu.
BIRTH ORDER AND SELF-CONCEPT: THEIR RELATIONSHIP TO READING ACHIEVEMENT

THESIS

Submitted to the Graduate Committee of the Department of Education and Human Development State University of New York College at Brockport in Partial Fulfillment of the Requirements for the Degree of Master of Science in Education

by

Laurie Maryjanowski Penepent

State University of New York College at Brockport Brockport, New York

November 1991
SUBMITTED BY:

Laurie Maryjanowski-Perez

APPROVED BY:

Perry D. Kegg 11/7/91
Project/Thesis Advisor

Arthur E. Smith 4/7/91
Second Faculty Reader

Harold Emerson 11/8/91
Chairman, Graduate
Policies Committee
The purpose of this study was to determine if there was a statistically significant relationship between students' birth order and reading achievement, self-concept and reading achievement, and their birth order and self-concept.

Research has shown that educational achievement was influenced by birth order, and that birth order affected self-concept.

A sample population of seventy-two subjects was used for this study. Subjects answered questions about their birth order and completed a self-concept scale. Their reading achievement score was taken from each subject's permanent folder.

The Chi-Square Test of Independence was used to determine if the relationship between each set of variables was statistically significant.

The Chi-Square Test of Independence showed that the relationships between birth order and reading achievement, and self-concept and reading achievement were not statistically significant. The variables of birth order and self-concept were found to be statistically significant.
# Table of Contents

**Chapter I**

- Statement of the Problem .................. 1
- Purpose ..................................... 1
- Questions to be Answered ............... 1
- Need for the Study ....................... 2
- Definition of Terms ....................... 3
- Limitations of the Study ............... 4

**Chapter II**

- Review of the Literature ................. 7
- Characteristics of Birth Orders ........... 7
- Birth Order and Achievement ............. 11
- Birth Order and Self-Concept ............ 18
- Summary of the Chapter ................... 23

**Chapter III**

- Design of the Study ....................... 24
- Hypotheses .................................. 24
- Methodology .................................. 25
- Summary ..................................... 27

**Chapter IV**

- Statistical Analysis ....................... 28
Table of Contents (Con't)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Findings</td>
<td>31</td>
</tr>
<tr>
<td>Analysis and Interpretation of Hypotheses</td>
<td>35</td>
</tr>
<tr>
<td>Summary</td>
<td>37</td>
</tr>
<tr>
<td>Chapter V</td>
<td></td>
</tr>
<tr>
<td>Conclusions and Implications</td>
<td>38</td>
</tr>
<tr>
<td>Conclusions</td>
<td>38</td>
</tr>
<tr>
<td>Implications for Research</td>
<td>38</td>
</tr>
<tr>
<td>Implications for Classroom Practice</td>
<td>39</td>
</tr>
<tr>
<td>References</td>
<td>42</td>
</tr>
<tr>
<td>Appendices</td>
<td></td>
</tr>
<tr>
<td>A. Scores of All Subjects</td>
<td>45</td>
</tr>
<tr>
<td>B. Scores Used for Birth Order - Reading Achievement Chi-Square</td>
<td>49</td>
</tr>
<tr>
<td>C. Scores Used for Self-Concept - Reading Achievement Chi-Square</td>
<td>52</td>
</tr>
<tr>
<td>D. Scores Used for Birth Order - Self-Concept Chi-Square</td>
<td>55</td>
</tr>
</tbody>
</table>
Chapter I

Statement of the Problem

Purpose
The purpose of this study was to determine if there was a statistically significant relationship between students' birth order and reading achievement, self-concept and reading achievement and their birth order and self-concept.

Questions
1. Is there a statistically significant correlation between students' order of birth in their family and their reading achievement?

2. Is there a statistically significant correlation between students' self-concept and their reading achievement?

3. Is there a statistically significant correlation between students' order of birth in their family and their self-concept?
Need for the Study

Everyone is a part of a family unit and has a ‘place’ in that unit. That ‘place’ can have a positive or negative influence on the characteristics of a person’s personality and his/her abilities in life. This ‘place’ or order in the family can affect one’s self-concept which can in turn affect that person’s reading achievement or visa versa. One’s order in a family could affect their reading achievement which could then in turn affect the person’s self-concept.

Intellectual performance is negatively affected by family size, that is, the more children in a family, the lower the intellectual performance of the children of that family (Zajonc and Markus, 1975). This is especially true of the last born child, who has the greatest intellectual decline than any other birth order rank. With a focus on reading performance, Ernst and Angst found that reading retardation was more frequent in children of large sibships (1983). This was due to factors such as parents’ lack of interaction with the younger children and older, less capable, siblings acting as teachers to their
younger siblings. This 'teacher' role benefits the older sibling's intellectual and leadership skills development. In this sense, then, only children and last born children do not benefit from this intellectual stimulation (Zajonc and Markus, 1975).

Looking at birth order, self-concept and reading achievement, this study was developed to see if there was a correlation between birth order and reading achievement, self-concept and reading achievement, and birth order and self-concept.

Definitions

Birth Order: The order in which a child was born in a family unit. The spacing of children can change birth order labeling (Cass, 1990).

First born and only child: The first born child to a family or the only child born to a family. Five or more years between siblings begins another family and another first child (Cass, 1990).
Second born and middle child: The second child. This child can be the second of three children, the second or third of four, etc. (Cass, 1990).

Youngest or last born: The youngest sibling, even if there are only two children; often referred to as the baby of the family (Cass, 1990).

Self-concept: The personal judgement of worthiness expressed in the attitudes one holds for oneself. It indicates the extent to which an individual believes the self to be capable, successful and worthy (Coopersmith, 1967).

Limitations of the Study
The current study had its limitations. The sample size used was small, only 72 subjects. The subjects were from a parochial school with very little extra help or support given to those students who were underachievers in reading. This extra help to underachieving students is a common practice in most public schools.
As with any study involving birth order, there was an overrepresentation of first born subjects, since every family has to have a first born child before it can have any other birth order. Also of a disadvantage within the families used is that whole families were not investigated, simply the students from the parochial school who were in junior high. This is a limitation because those children who are of the same age in the same grade and are of the same birth order have varied experiences depending on the age of their siblings, whether they be close together in age or so far apart in years as to be practically starting another birth order (Adams, 1972).

A third limitation was parental age of the subjects. Younger aged parents may be more achievement oriented because they themselves had the opportunity to go to college and experience the value of it whereas older parents may be less achievement oriented toward their children because achievement and college attendance were less valued at the time they grew up (Adams, 1972).

A last limitation was the Piers-Harris Children's Self-Concept Scale used to determine
the subjects' self-concept. The subjects may have answered this questionnaire in a way they thought would benefit the researcher - agreeing with the positive statements and disagreeing with the negative ones - even though they may have felt differently about the item. Subjects may have also feared embarrassment from answering honestly even though the researcher guaranteed them that no one else would see the scale.
Chapter II

Review of the Literature

The effects of birth order on reading achievement, self-concept on reading achievement, and birth order on self-concept were examined in this study. First, characteristics of birth orders were studied to determine basic accepted generalities of each order. Second, research examined birth order more specifically as an influence on educational achievement. Lastly, birth order was examined as an influence on self-concept. Very little research was found linking self-concept to reading achievement.

Characteristics of Birth Orders

"A child's position in the sequence of brothers and sisters is of very great significance for the course of his later life" (Freud, 1938, p. 182) because "parents have different attitudes toward first-borns, last-borns, and children in between" (Wilson and Edington, 1981, p. 2).

First born children are thought of as more conforming and more responsible (Adams, 1972)
because of their duty of caring for their siblings (Green, 1978) and their acting as a surrogate parent to them (Rosen, 1961). They tend to talk at an earlier age than later born children and are more sensitive to their parents' expectations due to their greater access to the parents earlier in their lives. One would also call the first born more adult-oriented than his siblings because of his early closeness to his parents without sibling interruption. This would also account for his fondness of doing things for their parents (Rosen, 1961), (McArthur, 1956).

When an only child becomes the oldest to a sibling, the oldest child finds himself bigger, stronger, and better than his sibling. This natural superiority is due to the oldest birth order. This child can never be displaced from his first born seat (Lees and Stewart, 1957).

Because of the first born's adult-orientation, he is likely to protest when left by his mother and is more likely to seek adult acceptance and help (Green, 1978). This orientation also makes the oldest child least comfortable with his age mates. He usually
prefers much older children, due to his self modeling of his parents' behavior (Baskett, 1984), or much younger ones (Wilson and Edington, 1981) due to his surrogate parenthood (Rosen, 1961).

In studies by Adams (1972) and Green (1978), it was noted that first born children experienced greater anxiety and fear in anxiety-arousing situations than their later born siblings who were more eager to take chances and were more likely to take risks involving pain. This anxiety may be explained by a study by Hilton (1967). Hilton's study showed mothers of first borns interfering significantly more often with their child's activity than mothers of later born children. This interference by mothers may arouse anxiety in first born children who are looking for acceptance by their mother.

Later born children are often more peer-oriented. This is a result of their being around and modeling themselves after their siblings (Rosen, 1961). But the youngest child is thought to be the most popular in school according to Green (1978).
Explanations for these general characteristics range from parental love to intrauterine environment. It is universally thought that the first born spends his formative years with parents who are in love and are affectionate towards one another whereas later born children may grow up with parents who are barely tolerant of each other and who may harbor many years of unexpressed grievances (Wilson and Edington, 1981).

Another reason birth orders are affected is because the pregnancy with the first born child is usually highly anticipated, thus, family resources are concentrated on that first child. Also, the first born child has a monopoly of mom and dad's attention until the second child is born. There is no competition for parental time so parental interest towards the child is undivided (Green, 1978). Later born children may be born to older parents who may have less energy for interaction and stimulation of these children (Blake, 1989). Their pregnancies are less anticipated and economic factors may also change as the number of children in a family changes.
Warren's explanation (1966) for birth order differences is a physical one. He states that the intrauterine environment provided by the mother varies with her age and the number of pregnancies she has experienced. Both of these factors are believed to be associated with the trait of one's birth order.

These general characteristics form a basic outline to better understand how birth order affects human beings. This explains Baskett's (1984, p. 1026) belief that "ordinal position has frequently been suggested to be an important mediating variable in children's social, emotional and intellectual development".

Birth Order and Achievement

The first study relating birth order to achievement was conducted in 1874 by Sir Francis Galton in *English Men of Science* (Altus, 1966). It has since been an intrigue to researchers all over the world.

Each particular birth order is uniquely favored or disfavored regarding parental attention, interaction and thus, motivation to
learn (Blake, 1989). Belmont and Marolla's (1973) study supported this idea by demonstrating that children from larger families tend to do poorer on intelligence tests and educational measurements when social class is controlled, as the birth order became progressively larger, test scores became poorer. This follows the belief that as birth order increases, performance decreases (Belmont and Marolla, 1973).

Standard achievement test scores are negatively correlated with birth order, with a significant correlation of verbal abilities (Green, 1978). In studies by Oberlander and Jenkin (1967) and Sampson and Hancock (1967), first born children significantly excelled later born children in IQ and achievement. When IQ tests were broken down and analyzed according to subtests, it was found that first borns scored higher than later borns of equivalent age on the verbal portion of IQ tests (1967). When SAT scores were considered, scores dropped dramatically from first to last born children in two-child families. When three-child families were considered, the first born exceeded the
second born in performance who exceeded the third born (Zajonc and Markus, 1975).

Language is also negatively affected by increased birth order. Using the vocabulary and reading subtests of the WISC as a measure of verbal ability, Blake (1989) believed interaction with adults in 'cognitively and motivationally stimulating settings' was of great importance to a child's verbal and linguistic abilities. Because these 'stimulating settings' are limited in large families, due to the fact that adult interaction with children is limited, "children from large families only suffer certain kinds of ability deficits - those that are known to be particularly associated with low levels of parent-child interaction" - verbal ability being the greatest sufferer (Blake, 1989, p. 117). Children born closer together and middle and last born children were believed to show lower language levels because the middle and last child are influenced by the immature language of their older sibling. Reading and vocabulary ability are also significantly lower for narrowly spaced sibships (Green, 1978).
In Altus' study using the scores of a 1959 aptitude test he determined that first born children scored significantly higher than did later born children on the verbal test of Intelligence (1966). Reading achievement scores for first borns was also shown to be significantly higher than later born children in a 1970 study by Oberlander, Jenkin, Houlihan, and Jackson.

Grade point averages of Minnesota high school students who were first borns were also found to be higher than the G.P.A.'s of other birth orders (Schachter, 1963). A final bias favoring the first born child academically refers to the study of a gifted program whose majority of participants were first born children (Altus, 1965).

In an 1989 study by Blake there was found to be a marked linear relationship between sibsize and total years of education attained. Oldest children were more likely to go on to college where the youngest, in most surveys, did not exceed a high school education. This supports Schachter's (1963) belief that there is a marked selective factor at work determining who is educated with the likelihood of going to college...
closely associated with family size and the first born child (Altus, 1965).

These same studies showed that 60% of all entering college students were first born children (Altus, 1965) and 57.8% of graduate and 50.2% of undergraduate students were first borns (Schachter, 1963).

The number of years between siblings may also influence one's achievement. Rosenberg and Sutton-Smith (1969) believe that the farther the number of years between male siblings, the less negative the influence was on second and later born children, however, closer spacing was found to facilitate female achievement.

One explanation of the academic superiority of the oldest child is given by Lees and Stewart (1957) who explain that the oldest child lived in an adult world longer than his siblings and so is liable to be intellectually more mature than his younger siblings. This allows him to be better fitted for coping with situations in the classroom and taking intelligence tests.

A second explanation reasons that there is no frame of reference in parents' expectations of the
first born child so his abilities are overestimated and he has higher standards of performance (Rothbart, 1971). Rothbart's study (1971) proved there was a significant correlation between birth order and performance expectation showing that mothers of first born children exerted more pressure on their child to complete a task efficiently and well. These mothers were more anxious to intrude on their child to correct and praise him and also used more complex language with this child.

Another plausible explanation for the differential academic attainment of first and later borns is achievement motivation - action aroused by cues in situations involving standards of excellence (Bragg, 1970). These standards are typically learned from parents with rewards and punishments for performing well or failing. "In our culture, the behavior of people with strong achievement motivation is characterized by persistent striving and general competitiveness" (Rosen, 1961, p. 574). In his studies, Rosen (1961) found an inverse relationship between family size and achievement motivation. The
larger the family, the lower the achievement of the children was. This would explain why first born children have higher grade point averages in high school than their later born siblings (Altus, 1965).

Dethronement takes place when an only child is no longer the sole occupant of his parents’ attention because a second child has been born. Dethronement is another explanation of the oldest child’s academic superiority. In order for the first born child to cope with dethronement, he may capitalize on his superior intellectual, especially language, attainments (Oberlander and Jenkin, 1967). This enables him to still receive parental attention after the dethronement by a sibling and leads to accelerated linguistic development, intellectual exploration and school achievement (Oberlander and Jenkin, 1967).

The age of mothers is also questioned when determining the cause of birth order’s effects on achievement. Adams (1972) believed the fetus received more nourishment from a young mother who has experienced fewer pregnancies. This increased nourishment allows for healthier, more intelligent
earlier born children. This might also explain why, in Zajonc and Markus' (1975) study of twins, verbal scores of twins were lower than that of single births' and the verbal scores of triplets was even lower than twins'.

A last explanation for the inverse relation between birth order and achievement is the intellectual environment of the family. The environment in a large family may be more childlike due to the number of children and lack of adult conversation, vocabulary or interests in it (Blake, 1989). Therefore, the more siblings there are in a family, the lower the intelligence of the environment from which to learn and grow (Zajonc and Markus, 1975). Parents are brought down to their children's verbal ability and interaction as opposed to the children being brought up to the adult world in conversation (Blake, 1989).

**Birth Order and Self-Concept**

Generally speaking, people with a high self-concept are happier, more assertive and creative and are better able to meet environmental
demands than people with a low self-concept. They also tend to have a close, supportive relationship with their siblings. Those individuals with an average self-concept usually regard themselves as better than most, but not as good as others. Their personality is closer to people with a high self-concept. Those individuals with a low self-concept exhibit higher levels of anxiety and more feelings of depression and pessimism. They also are usually unwilling to express their thoughts and ideas (Coopersmith, 1967).

Because ordinal position may influence with whom one interacts (Baskett, 1984), "the family constellation is an important determinant of personality" (McArthur, 1956, p. 47). This would give reason to the many theories about how birth order affects self-concept. According to Miller and Maruyama's (1976) research, the oldest sibling is the least popular, the youngest is the most popular and the middle child or children are 'somewhere in between.' As a consequence of experience with raising children, parents treat their first and later born children differently.
These differences in treatment produce personality differences which result in greater popularity for the later born child. The youngest child is seen as more sociable and friendly and less demanding and jealous (Miller and Maruyama, 1976), (Obernethy, 1940). These qualities may have been acquired due to the interaction of the siblings within the home. The later born children, possessing less power than their older siblings, may have been required to develop more effective interpersonal skills of negotiation, accommodation and tolerance, not found in first born children. These skills, in turn, increase the youngest's popularity because he is better liked (Miller and Maruyama, 1976).

First born children are more likely to pursue their aims as individuals, not belonging to a group or being influenced by one (Lees and Stewart, 1957). Middle children, however, are found to more often pursue their aims as the member of a group. These children also find themselves as unimportant, not strong like the oldest child or weak, like the youngest (Lees and Stewart, 1957). Middle children also feel left
out because they are too old for some activities and yet too young for others (Wilson and Edington, 1981).

The youngest child is seen as less self-sufficient and less dominant than his siblings (Obernethy, 1940). He is more likely to be pampered and over-protected by his parents and so never truly becomes self-reliant (Rosen, 1961). This over-protection also causes the youngest child to tend to blame others for situations that are his own responsibility or cause the youngest to have a lack of responsibility (Wilson and Edington, 1981). Adler's theory of the youngest's lack of responsibility says that the youngest can never become independent because people spoil him and cause him to lose the courage needed to succeed on his own (Adler, 1958).

Later born siblings were seen by Warren (1966) as less anxious than their older siblings. He saw them as experiencing the move into new and potentially stressful situations vicariously through their older siblings. This allows the later born children to face these same situations with greater confidence than their older siblings.
Zajonc and Markus (1975) offer both genetic and environmental factors for the differences in self-concept in children. They claim that the genetics of the parents may be one determinant of self-concept. Another is the unique experiences of each individual in the family which may influence the way one feels about oneself.
Summary

Research has shown that educational achievement was influenced by birth order. The higher one's birth order in the family, the lower his/her achievement was. Birth order also affected self-concept, finding the oldest child the least popular and the youngest child most popular. The only research found connecting self-concept and achievement stated that a lower self-concept can lead to a child's lower G.P.A. in school because self-concept is significantly associated with ability and academic performance (Coopersmith, 1967).
Chapter III

Design of the Study

The purpose of this study was to determine if there was a statistically significant relationship between students' birth order and reading achievement, self-concept and reading achievement, and their birth order and self-concept.

Null Hypotheses

The null hypotheses were:

1. There is not a statistically significant correlation between students' order of birth in their family and their reading achievement.

2. There is not a statistically significant correlation between students' self-concept and their reading achievement.

3. There is not a statistically significant correlation between students' order of birth in their family and their self-concept.
Methodology

Subjects

The subjects for this study were 72 junior high students from grades six through eight attending a parochial school in western New York. All were in heterogeneously grouped developmental reading classes in their respective grades. Reading achievement of the subjects in each grade varied from very low to above average, according to their reading teachers.

Instruments

The materials for this study included data to determine the subjects' birth order in their family and the Piero-Harris Children's Self-Concept Scale. Reading achievement was determined using subjects' Stanford Achievement Test scores. The sixth grade subjects' Total Reading score on the Stanford Achievement Test taken by them in May of their sixth grade year was used. The seventh and eighth grade subjects' scores were taken from their seventh grade Total Reading score of the SAT administered to them in
May 1990 and May 1989 respectively. All SAT's were Intermediate Level Form J.

Procedure

The Piers-Harris Children's Self-Concept Scale was administered during each grade's Language Arts class by the researcher. As the scales were collected, the researcher asked each subject how many children were in his/her family, what rank he/she was, and how many years separated the subject and the closest-aged sibling.

The Total Reading score was taken from each subject's permanent record file.

Analysis of Data

The scores from each student's reading achievement test and Piers-Harris Self-Concept Scale, along with each student's birth order was correlated using a Chi Square Test of Independence to determine if any relationship existed between birth order and reading achievement, self-concept and reading achievement and birth order and self-concept.
Summary

Seventy-two junior high subjects' reading achievement scores, birth orders and self-concept scale scores were analyzed to determine if there was a statistically significant correlation between birth order and reading achievement, self-concept and reading achievement and birth order and self-concept.
Statistical Analysis

The purpose of this study was to determine if there was a statistically significant relationship among students' birth order, reading achievement, and self-concept.

The three hypotheses investigated in this study stated:

1. There is no statistically significant correlation between students' order of birth in their family and their reading achievement.

2. There is no statistically significant correlation between students' self-concept and their reading achievement.

3. There is no statistically significant correlation between students' order of birth in their family and their self-concept.
For the Chi-Square Test of Independence each variable was separated into three categories. The categories of the birth order variable were oldest, middle, and youngest. The categories of reading achievement were high, average, and low. The categories of the self-concept variable were also high, average, and low.

The reading achievement categories were determined by ranking the subjects' percentile scores. A high ranking score ranged from the 67th - 99th percentile. An average percentile score ranged from the 34th - 66th percentile. A low reading achievement rank ranged from the 1st - 33rd percentile.

The Piers-Harris Self-Concept Scale ranking was determined according to the test manual. The manual ranked a high self-concept as one which scored in the 71st - 99th percentile. An average self-concept scored between the 69th and 31st percentile. The 1st - 29th percentile determined a low self-concept.

A limitation in using the percentile rank to determine high, average, and low reading
achievement and self-concept is the standard error of measure. Standard error of measure is the amount by which the score may differ from the hypothetical true score due to errors of measure...it can be said that chances are 2:1 that the actual score is within a band extending from 'true score minus one standard error of measure' to 'true score plus one standard error of measure' (Mitchell, 1972, p. 7).

In order to determine the standard error of measure for the Piers-Harris Self-Concept Scale, the researcher multiplied the standard deviation of the scale by the square root of one minus the reliability of the scale. The standard deviation and the reliability were given in the scale's manual. The standard error of measure of the Stanford Achievement Test's Total Reading score was given in the Norms Booklet of the test.

Using the standard error of measure, the researcher was able to eliminate those subjects who were borderline between one ranking of a given category and another ranking. The standard error of measure allowed the researcher to be more confident in the subjects included in each category. Because of this elimination of the borderline subjects, not all 72 subjects were...
analyzed in each chi-square. Only those subjects who qualified for both variables of the chi-square were analyzed.

Findings

The Chi-Square Test of Independence was used to determine if there was a significant relationship between each pair of variables. The variables of birth order and reading achievement are shown in Table 1.

Table 1. Chi-Square Test of Independence for Birth Order and Reading Achievement

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Average</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oldest</td>
<td>14.5</td>
<td>14</td>
<td>1.6</td>
</tr>
<tr>
<td>Middle</td>
<td>4.3</td>
<td>4.2</td>
<td>.5</td>
</tr>
<tr>
<td>Youngest</td>
<td>8.2</td>
<td>7.9</td>
<td>.9</td>
</tr>
</tbody>
</table>

The analysis of the data regarding birth order and reading achievement had a reading
achievement standard error of measure of 6.9, therefore, only 56 of the 72 subjects qualified for the study since 16 subjects had borderline scores. The results of the chi-square failed to reject the null hypothesis that the variables of birth order and reading achievement are independent of one another. No significant relationship exists between birth order and reading achievement.

The variables of self-concept and reading achievement are shown in Table 2.

Table 2. Chi-Square Test of Independence for Self-Concept and Reading Achievement

<table>
<thead>
<tr>
<th></th>
<th>Reading Achievement</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Average</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Self: High</td>
<td>11</td>
<td>7</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Self: Average</td>
<td>8</td>
<td>8</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Self: Low</td>
<td>5</td>
<td>9</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
The analysis of the data regarding self-concept and reading achievement had a standard error of measure of 4.38 for the self-concept variable. The reading achievement standard error of measure was again 6.9. Due to the standard error of measure, the number of subjects who qualified for this analysis was 51. The results of this Chi-Square Test of Independence failed to reject the null hypothesis. No significant relationship exists between self-concept and reading achievement.

The variables of birth order and self-concept are shown in Table 3.
Table 3. Chi-Square Test of Independence for Birth Order and Self-Concept

<table>
<thead>
<tr>
<th></th>
<th>Oldest</th>
<th>Middle</th>
<th>Youngest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Se High</strong></td>
<td>9.51</td>
<td>3.51</td>
<td>6</td>
</tr>
<tr>
<td><strong>Middle</strong></td>
<td>6</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td>11.51</td>
<td>4.2</td>
<td>7.3</td>
</tr>
<tr>
<td><strong>C Average</strong></td>
<td>16</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td><strong>Concept</strong></td>
<td>12</td>
<td>4.4</td>
<td>7.6</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td>11</td>
<td>1</td>
<td>12</td>
</tr>
</tbody>
</table>

The analysis of data regarding birth order and self-concept had the same standard error of measure of 4.38. This analysis had 66 qualifying subjects. The results of this chi-square reject the null hypothesis that birth order and self-concept are independent of one another. A significant relationship does exist between these two variables.
Findings indicated that no significant relationship existed between birth order and reading achievement or between self-concept and reading achievement. Though literature has shown birth order and academic achievement to be related, this study's focus on reading achievement failed to substantiate this relationship.

This Chi-Square Test of Independence did show a significant relationship existed between birth order and self-concept. The expected values varied significantly from the observed values in five of the nine cells of the chi-square. The oldest category was found to have fewer subjects with a high self-concept than expected, and more subjects with an average self-concept than expected.

The middle category studied here had one subject with a low self-concept where the expected value was four. Therefore, there were fewer middle children with a low self-concept than expected.

The last born or youngest category of child studied had similar results as that of the oldest
child, but in the categories of average and low self-concept, respectively. There were fewer youngest children with an average self-concept than expected, but more youngest children with a low self-concept than expected.

Using the group of 72 junior high parochial school subjects, the researcher saw a significant relationship between birth order and self-concept. More oldest children had average self-concepts than expected, fewer middle children had low self-concepts than expected and the youngest child, with the greatest differences between observed and expected values, had fewer subjects with an average self-concept, but more youngest children with a low self-concept.
Summary

The Chi-Square Test of Independence used to determine if there was a significant relationship between two variables failed to reject the null hypotheses that birth order was related to reading achievement and the hypothesis that self-concept was related to reading achievement. This test did, however, reject the null hypothesis that birth order is not related to self-concept. The results show there is a significant relationship between birth order and self-concept.

More oldest and youngest children had average and lower self-concepts than expected. The subjects who were middle children, however, had higher self-concepts than expected.
Chapter V

Conclusions and Implications

Conclusion

This study investigated whether there was a statistically significant relationship among students' birth order, reading achievement, and self-concept.

Results of the study showed that birth order and reading achievement were independent of one another, self-concept and reading achievement were independent of one another, but that there was a relationship between birth order and self-concept.

Implications for Research

Further research in the areas of birth order, reading achievement and self-concept might include a study of whole families. Written-in comments of subjects of the same family on the Piers-Harris Self-Concept Scale indicated that the family environment may cause birth order to affect self-concept due to the family's treatment of a member of a particular birth order. This would allow one to examine the different birth order positions within a family unit and relieve the
over-representation of the first born child involved in the study.

A qualitative study on birth order might discuss the experiences of families and judge if and how the children have changed as the family's size increased and their birth order possibly changed. This could also be extended to include a decrease in family size as children leave home. Other qualitative research may choose to interview the subjects of the study instead of simply using a yes/no scale to judge self-concept. This would allow the researcher to probe subjects for a clearer understanding of their feelings.

Further research may also see a researcher making up her own reading scale to determine reading achievement. This way, one could decide whether the subjects were achieving above, at or below their actual grade in school instead of judging them as high-, average-, or low-achieving readers.

Implications for Classroom Practice

People's self-concept and reading achievement can change; their birth order can not. Therefore,
Educators should try different ways to better their students' self-concept and reading achievement levels.

Paying special attention to children with low self-concepts can help them to feel better about themselves. This special attention can come in the form of talking with them privately, noting when they've succeeded at something they were unsure of and calling on them in class to answer a question to which one is sure they know the answer.

Educators could also work with the parents of these children to help them build up their child's self-concept. They should also explain to parents that students with low self-concepts may have feelings of inferiority and failure. They may not trust their own abilities and therefore, not take the risks to succeed. This lack of risk-taking can then lead to under-achievement.

To improve their students' reading achievement, educators should provide a literature-enriched environment. Materials in it should encompass all interests and abilities of the children. The classroom library may also
include books whose characters are of various birth orders. The feelings conveyed by the characters about their birth order may help children too ashamed to talk to anyone about the way they feel feel as if they have a friend, someone to whom they can relate.
References


<table>
<thead>
<tr>
<th>STUDENT</th>
<th>SAT P. R.</th>
<th>P-H P. R.</th>
<th>BIRTH ORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>94</td>
<td>91</td>
<td>Youngest</td>
</tr>
<tr>
<td>2</td>
<td>81</td>
<td>91</td>
<td>Oldest</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
<td>91</td>
<td>Oldest</td>
</tr>
<tr>
<td>4</td>
<td>91</td>
<td>89</td>
<td>Youngest</td>
</tr>
<tr>
<td>5</td>
<td>73</td>
<td>87</td>
<td>Oldest</td>
</tr>
<tr>
<td>6</td>
<td>29</td>
<td>87</td>
<td>Oldest</td>
</tr>
<tr>
<td>7</td>
<td>74</td>
<td>85</td>
<td>Youngest</td>
</tr>
<tr>
<td>8</td>
<td>56</td>
<td>85</td>
<td>Youngest</td>
</tr>
<tr>
<td>9</td>
<td>78</td>
<td>82</td>
<td>Oldest</td>
</tr>
<tr>
<td>10</td>
<td>69</td>
<td>82</td>
<td>Youngest</td>
</tr>
<tr>
<td>11</td>
<td>91</td>
<td>79</td>
<td>Youngest</td>
</tr>
<tr>
<td>12</td>
<td>86</td>
<td>79</td>
<td>Youngest</td>
</tr>
<tr>
<td>13</td>
<td>69</td>
<td>79</td>
<td>Youngest</td>
</tr>
<tr>
<td>14</td>
<td>27</td>
<td>79</td>
<td>Oldest</td>
</tr>
<tr>
<td>15</td>
<td>71</td>
<td>77</td>
<td>Oldest</td>
</tr>
<tr>
<td>16</td>
<td>69</td>
<td>77</td>
<td>Oldest</td>
</tr>
<tr>
<td>17</td>
<td>37</td>
<td>77</td>
<td>Oldest</td>
</tr>
<tr>
<td>18</td>
<td>99</td>
<td>74</td>
<td>Youngest</td>
</tr>
<tr>
<td>19</td>
<td>79</td>
<td>74</td>
<td>Youngest</td>
</tr>
<tr>
<td>20</td>
<td>60</td>
<td>74</td>
<td>Youngest</td>
</tr>
<tr>
<td>STUDENT</td>
<td>SAT P. R.</td>
<td>P-H P. R.</td>
<td>BIRTH ORDER</td>
</tr>
<tr>
<td>---------</td>
<td>----------</td>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>21</td>
<td>56</td>
<td>74</td>
<td>Oldest</td>
</tr>
<tr>
<td>22</td>
<td>56</td>
<td>74</td>
<td>Youngest</td>
</tr>
<tr>
<td>23</td>
<td>54</td>
<td>74</td>
<td>Middle</td>
</tr>
<tr>
<td>24</td>
<td>52</td>
<td>74</td>
<td>Oldest</td>
</tr>
<tr>
<td>25</td>
<td>46</td>
<td>71</td>
<td>Oldest</td>
</tr>
<tr>
<td>26</td>
<td>86</td>
<td>66</td>
<td>Middle</td>
</tr>
<tr>
<td>27</td>
<td>67</td>
<td>66</td>
<td>Youngest</td>
</tr>
<tr>
<td>28</td>
<td>60</td>
<td>63</td>
<td>Oldest</td>
</tr>
<tr>
<td>29</td>
<td>47</td>
<td>63</td>
<td>Oldest</td>
</tr>
<tr>
<td>30</td>
<td>31</td>
<td>63</td>
<td>Oldest</td>
</tr>
<tr>
<td>31</td>
<td>35</td>
<td>60</td>
<td>Oldest</td>
</tr>
<tr>
<td>32</td>
<td>97</td>
<td>57</td>
<td>Oldest</td>
</tr>
<tr>
<td>33</td>
<td>67</td>
<td>57</td>
<td>Middle</td>
</tr>
<tr>
<td>34</td>
<td>37</td>
<td>57</td>
<td>Middle</td>
</tr>
<tr>
<td>35</td>
<td>86</td>
<td>55</td>
<td>Oldest</td>
</tr>
<tr>
<td>36</td>
<td>62</td>
<td>55</td>
<td>Oldest</td>
</tr>
<tr>
<td>37</td>
<td>56</td>
<td>55</td>
<td>Oldest</td>
</tr>
<tr>
<td>38</td>
<td>85</td>
<td>52</td>
<td>Middle</td>
</tr>
<tr>
<td>39</td>
<td>84</td>
<td>52</td>
<td>Oldest</td>
</tr>
</tbody>
</table>
### Appendix A  Con’t.

<table>
<thead>
<tr>
<th>STUDENT</th>
<th>SAT P. R.</th>
<th>P-H P. R.</th>
<th>BIRTH ORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>12</td>
<td>49</td>
<td>Oldest</td>
</tr>
<tr>
<td>41</td>
<td>74</td>
<td>46</td>
<td>Oldest</td>
</tr>
<tr>
<td>42</td>
<td>48</td>
<td>46</td>
<td>Oldest</td>
</tr>
<tr>
<td>43</td>
<td>58</td>
<td>41</td>
<td>Oldest</td>
</tr>
<tr>
<td>44</td>
<td>43</td>
<td>41</td>
<td>Oldest</td>
</tr>
<tr>
<td>45</td>
<td>74</td>
<td>38</td>
<td>Middle</td>
</tr>
<tr>
<td>46</td>
<td>67</td>
<td>36</td>
<td>Oldest</td>
</tr>
<tr>
<td>47</td>
<td>67</td>
<td>36</td>
<td>Youngest</td>
</tr>
<tr>
<td>48</td>
<td>99</td>
<td>33</td>
<td>Oldest</td>
</tr>
<tr>
<td>49</td>
<td>48</td>
<td>31</td>
<td>Youngest</td>
</tr>
<tr>
<td>50</td>
<td>76</td>
<td>29</td>
<td>Oldest</td>
</tr>
<tr>
<td>51</td>
<td>74</td>
<td>29</td>
<td>Youngest</td>
</tr>
<tr>
<td>52</td>
<td>74</td>
<td>29</td>
<td>Middle</td>
</tr>
<tr>
<td>53</td>
<td>64</td>
<td>29</td>
<td>Oldest</td>
</tr>
<tr>
<td>54</td>
<td>65</td>
<td>27</td>
<td>Youngest</td>
</tr>
<tr>
<td>55</td>
<td>41</td>
<td>27</td>
<td>Youngest</td>
</tr>
<tr>
<td>56</td>
<td>77</td>
<td>24</td>
<td>Oldest</td>
</tr>
<tr>
<td>57</td>
<td>69</td>
<td>24</td>
<td>Youngest</td>
</tr>
<tr>
<td>58</td>
<td>64</td>
<td>23</td>
<td>Middle</td>
</tr>
<tr>
<td>59</td>
<td>62</td>
<td>20</td>
<td>Oldest</td>
</tr>
<tr>
<td>60</td>
<td>74</td>
<td>18</td>
<td>Middle</td>
</tr>
<tr>
<td>STUDENT</td>
<td>SAT P. R.</td>
<td>P-H P. R.</td>
<td>BIRTH ORDER</td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>61</td>
<td>43</td>
<td>18</td>
<td>Oldest</td>
</tr>
<tr>
<td>62</td>
<td>92</td>
<td>15</td>
<td>Middle</td>
</tr>
<tr>
<td>63</td>
<td>76</td>
<td>15</td>
<td>Oldest</td>
</tr>
<tr>
<td>64</td>
<td>50</td>
<td>15</td>
<td>Youngest</td>
</tr>
<tr>
<td>65</td>
<td>69</td>
<td>14</td>
<td>Middle</td>
</tr>
<tr>
<td>66</td>
<td>60</td>
<td>14</td>
<td>Youngest</td>
</tr>
<tr>
<td>67</td>
<td>78</td>
<td>11</td>
<td>Youngest</td>
</tr>
<tr>
<td>68</td>
<td>62</td>
<td>10</td>
<td>Youngest</td>
</tr>
<tr>
<td>69</td>
<td>50</td>
<td>5</td>
<td>Middle</td>
</tr>
<tr>
<td>70</td>
<td>67</td>
<td>3</td>
<td>Middle</td>
</tr>
<tr>
<td>71</td>
<td>62</td>
<td>3</td>
<td>Oldest</td>
</tr>
<tr>
<td>72</td>
<td>41</td>
<td>2</td>
<td>Oldest</td>
</tr>
</tbody>
</table>
Appendix B

<table>
<thead>
<tr>
<th>STUDENT</th>
<th>SAT P. R.</th>
<th>BIRTH ORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12</td>
<td>OLDEST</td>
</tr>
<tr>
<td>2</td>
<td>27</td>
<td>OLDEST</td>
</tr>
<tr>
<td>3</td>
<td>29</td>
<td>OLDEST</td>
</tr>
<tr>
<td>4</td>
<td>37</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>5</td>
<td>37</td>
<td>OLDEST</td>
</tr>
<tr>
<td>6</td>
<td>41</td>
<td>OLDEST</td>
</tr>
<tr>
<td>7</td>
<td>41</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>8</td>
<td>43</td>
<td>OLDEST</td>
</tr>
<tr>
<td>9</td>
<td>43</td>
<td>OLDEST</td>
</tr>
<tr>
<td>10</td>
<td>46</td>
<td>OLDEST</td>
</tr>
<tr>
<td>11</td>
<td>47</td>
<td>OLDEST</td>
</tr>
<tr>
<td>12</td>
<td>48</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>13</td>
<td>48</td>
<td>OLDEST</td>
</tr>
<tr>
<td>14</td>
<td>50</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>15</td>
<td>50</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>16</td>
<td>52</td>
<td>OLDEST</td>
</tr>
<tr>
<td>17</td>
<td>54</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>18</td>
<td>56</td>
<td>OLDEST</td>
</tr>
<tr>
<td>19</td>
<td>56</td>
<td>OLDEST</td>
</tr>
<tr>
<td>20</td>
<td>56</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>21</td>
<td>56</td>
<td>YOUNGEST</td>
</tr>
</tbody>
</table>
### Appendix B Con't.

<table>
<thead>
<tr>
<th>STUDENT</th>
<th>SAT P. R.</th>
<th>BIRTH ORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>58</td>
<td>OLDEST</td>
</tr>
<tr>
<td>23</td>
<td>60</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>24</td>
<td>60</td>
<td>OLDEST</td>
</tr>
<tr>
<td>25</td>
<td>60</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>26</td>
<td>62</td>
<td>OLDEST</td>
</tr>
<tr>
<td>27</td>
<td>62</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>28</td>
<td>62</td>
<td>OLDEST</td>
</tr>
<tr>
<td>29</td>
<td>62</td>
<td>OLDEST</td>
</tr>
<tr>
<td>30</td>
<td>71</td>
<td>OLDEST</td>
</tr>
<tr>
<td>31</td>
<td>73</td>
<td>OLDEST</td>
</tr>
<tr>
<td>32</td>
<td>74</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>33</td>
<td>74</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>34</td>
<td>74</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>35</td>
<td>74</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>36</td>
<td>74</td>
<td>OLDEST</td>
</tr>
<tr>
<td>37</td>
<td>74</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>38</td>
<td>76</td>
<td>OLDEST</td>
</tr>
<tr>
<td>39</td>
<td>76</td>
<td>OLDEST</td>
</tr>
<tr>
<td>40</td>
<td>77</td>
<td>OLDEST</td>
</tr>
<tr>
<td>41</td>
<td>78</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>STUDENT</td>
<td>SAT P. R.</td>
<td>BIRTH ORDER</td>
</tr>
<tr>
<td>---------</td>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>42</td>
<td>78</td>
<td>OLDEST</td>
</tr>
<tr>
<td>43</td>
<td>79</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>44</td>
<td>81</td>
<td>OLDEST</td>
</tr>
<tr>
<td>45</td>
<td>84</td>
<td>OLDEST</td>
</tr>
<tr>
<td>46</td>
<td>85</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>47</td>
<td>86</td>
<td>OLDEST</td>
</tr>
<tr>
<td>48</td>
<td>86</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>49</td>
<td>86</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>50</td>
<td>91</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>51</td>
<td>91</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>52</td>
<td>92</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>53</td>
<td>94</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>54</td>
<td>97</td>
<td>OLDEST</td>
</tr>
<tr>
<td>55</td>
<td>99</td>
<td>OLDEST</td>
</tr>
<tr>
<td>56</td>
<td>99</td>
<td>YOUNGEST</td>
</tr>
</tbody>
</table>
## Appendix C

<table>
<thead>
<tr>
<th>STUDENT</th>
<th>P-H P. R.</th>
<th>SAT P. R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>49</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>79</td>
<td>27</td>
</tr>
<tr>
<td>3</td>
<td>87</td>
<td>29</td>
</tr>
<tr>
<td>4</td>
<td>57</td>
<td>37</td>
</tr>
<tr>
<td>5</td>
<td>77</td>
<td>37</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>41</td>
</tr>
<tr>
<td>7</td>
<td>41</td>
<td>27</td>
</tr>
<tr>
<td>8</td>
<td>18</td>
<td>43</td>
</tr>
<tr>
<td>9</td>
<td>41</td>
<td>43</td>
</tr>
<tr>
<td>10</td>
<td>63</td>
<td>47</td>
</tr>
<tr>
<td>11</td>
<td>46</td>
<td>48</td>
</tr>
<tr>
<td>12</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>13</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>14</td>
<td>74</td>
<td>52</td>
</tr>
<tr>
<td>15</td>
<td>74</td>
<td>54</td>
</tr>
<tr>
<td>16</td>
<td>55</td>
<td>56</td>
</tr>
<tr>
<td>17</td>
<td>74</td>
<td>56</td>
</tr>
<tr>
<td>18</td>
<td>74</td>
<td>56</td>
</tr>
<tr>
<td>19</td>
<td>85</td>
<td>56</td>
</tr>
</tbody>
</table>
## Appendix C  Con’t.

<table>
<thead>
<tr>
<th>STUDENT</th>
<th>P-H P. R.</th>
<th>SAT P. R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>41</td>
<td>58</td>
</tr>
<tr>
<td>21</td>
<td>14</td>
<td>60</td>
</tr>
<tr>
<td>22</td>
<td>63</td>
<td>60</td>
</tr>
<tr>
<td>23</td>
<td>74</td>
<td>60</td>
</tr>
<tr>
<td>24</td>
<td>3</td>
<td>62</td>
</tr>
<tr>
<td>25</td>
<td>10</td>
<td>62</td>
</tr>
<tr>
<td>26</td>
<td>20</td>
<td>62</td>
</tr>
<tr>
<td>27</td>
<td>55</td>
<td>62</td>
</tr>
<tr>
<td>28</td>
<td>77</td>
<td>71</td>
</tr>
<tr>
<td>29</td>
<td>87</td>
<td>73</td>
</tr>
<tr>
<td>30</td>
<td>18</td>
<td>74</td>
</tr>
<tr>
<td>31</td>
<td>38</td>
<td>74</td>
</tr>
<tr>
<td>32</td>
<td>46</td>
<td>74</td>
</tr>
<tr>
<td>33</td>
<td>85</td>
<td>74</td>
</tr>
<tr>
<td>34</td>
<td>15</td>
<td>76</td>
</tr>
<tr>
<td>35</td>
<td>24</td>
<td>77</td>
</tr>
<tr>
<td>36</td>
<td>11</td>
<td>78</td>
</tr>
<tr>
<td>37</td>
<td>82</td>
<td>78</td>
</tr>
<tr>
<td>38</td>
<td>74</td>
<td>79</td>
</tr>
<tr>
<td>39</td>
<td>91</td>
<td>81</td>
</tr>
<tr>
<td>40</td>
<td>52</td>
<td>84</td>
</tr>
<tr>
<td>STUDENT</td>
<td>P-H P. R.</td>
<td>SAT P. R.</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>41</td>
<td>52</td>
<td>85</td>
</tr>
<tr>
<td>42</td>
<td>55</td>
<td>86</td>
</tr>
<tr>
<td>43</td>
<td>66</td>
<td>86</td>
</tr>
<tr>
<td>44</td>
<td>79</td>
<td>86</td>
</tr>
<tr>
<td>45</td>
<td>79</td>
<td>91</td>
</tr>
<tr>
<td>46</td>
<td>89</td>
<td>91</td>
</tr>
<tr>
<td>47</td>
<td>15</td>
<td>92</td>
</tr>
<tr>
<td>48</td>
<td>91</td>
<td>94</td>
</tr>
<tr>
<td>49</td>
<td>57</td>
<td>97</td>
</tr>
<tr>
<td>50</td>
<td>33</td>
<td>99</td>
</tr>
<tr>
<td>51</td>
<td>74</td>
<td>99</td>
</tr>
</tbody>
</table>
## Appendix D

<table>
<thead>
<tr>
<th>STUDENT</th>
<th>P-H P. R.</th>
<th>BIRTH ORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2</td>
<td>OLDEST</td>
<td></td>
</tr>
<tr>
<td>2 3</td>
<td>OLDEST</td>
<td></td>
</tr>
<tr>
<td>3 3</td>
<td>MIDDLE</td>
<td></td>
</tr>
<tr>
<td>4 5</td>
<td>MIDDLE</td>
<td></td>
</tr>
<tr>
<td>5 10</td>
<td>YOUNGEST</td>
<td></td>
</tr>
<tr>
<td>6 11</td>
<td>YOUNGEST</td>
<td></td>
</tr>
<tr>
<td>7 14</td>
<td>YOUNGEST</td>
<td></td>
</tr>
<tr>
<td>8 14</td>
<td>MIDDLE</td>
<td></td>
</tr>
<tr>
<td>9 15</td>
<td>YOUNGEST</td>
<td></td>
</tr>
<tr>
<td>10 15</td>
<td>OLDEST</td>
<td></td>
</tr>
<tr>
<td>11 15</td>
<td>MIDDLE</td>
<td></td>
</tr>
<tr>
<td>12 18</td>
<td>OLDEST</td>
<td></td>
</tr>
<tr>
<td>13 18</td>
<td>MIDDLE</td>
<td></td>
</tr>
<tr>
<td>14 20</td>
<td>OLDEST</td>
<td></td>
</tr>
<tr>
<td>15 23</td>
<td>MIDDLE</td>
<td></td>
</tr>
<tr>
<td>16 24</td>
<td>YOUNGEST</td>
<td></td>
</tr>
<tr>
<td>17 24</td>
<td>OLDEST</td>
<td></td>
</tr>
<tr>
<td>18 27</td>
<td>YOUNGEST</td>
<td></td>
</tr>
<tr>
<td>19 27</td>
<td>YOUNGEST</td>
<td></td>
</tr>
<tr>
<td>20 33</td>
<td>OLDEST</td>
<td></td>
</tr>
<tr>
<td>21 36</td>
<td>OLDEST</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix D  Con't.

<table>
<thead>
<tr>
<th>STUDENT</th>
<th>P-H P. R.</th>
<th>BIRTH ORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>36</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>23</td>
<td>38</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>24</td>
<td>41</td>
<td>OLDEST</td>
</tr>
<tr>
<td>25</td>
<td>41</td>
<td>OLDEST</td>
</tr>
<tr>
<td>26</td>
<td>46</td>
<td>OLDEST</td>
</tr>
<tr>
<td>27</td>
<td>46</td>
<td>OLDEST</td>
</tr>
<tr>
<td>28</td>
<td>49</td>
<td>OLDEST</td>
</tr>
<tr>
<td>29</td>
<td>52</td>
<td>OLDEST</td>
</tr>
<tr>
<td>30</td>
<td>52</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>31</td>
<td>55</td>
<td>OLDEST</td>
</tr>
<tr>
<td>32</td>
<td>55</td>
<td>OLDEST</td>
</tr>
<tr>
<td>33</td>
<td>55</td>
<td>OLDEST</td>
</tr>
<tr>
<td>34</td>
<td>57</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>35</td>
<td>57</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>36</td>
<td>57</td>
<td>OLDEST</td>
</tr>
<tr>
<td>37</td>
<td>60</td>
<td>OLDEST</td>
</tr>
<tr>
<td>38</td>
<td>63</td>
<td>OLDEST</td>
</tr>
<tr>
<td>39</td>
<td>63</td>
<td>OLDEST</td>
</tr>
<tr>
<td>40</td>
<td>63</td>
<td>OLDEST</td>
</tr>
</tbody>
</table>
Appendix D  Con’t.

<table>
<thead>
<tr>
<th>STUDENT</th>
<th>P-H P. R.</th>
<th>BIRTH ORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>66</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>42</td>
<td>66</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>43</td>
<td>74</td>
<td>OLDEST</td>
</tr>
<tr>
<td>44</td>
<td>74</td>
<td>MIDDLE</td>
</tr>
<tr>
<td>45</td>
<td>74</td>
<td>OLDEST</td>
</tr>
<tr>
<td>46</td>
<td>74</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>47</td>
<td>74</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>48</td>
<td>74</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>49</td>
<td>74</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>50</td>
<td>77</td>
<td>OLDEST</td>
</tr>
<tr>
<td>51</td>
<td>77</td>
<td>OLDEST</td>
</tr>
<tr>
<td>52</td>
<td>77</td>
<td>OLDEST</td>
</tr>
<tr>
<td>53</td>
<td>79</td>
<td>OLDEST</td>
</tr>
<tr>
<td>54</td>
<td>79</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>55</td>
<td>79</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>56</td>
<td>79</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>57</td>
<td>82</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>58</td>
<td>82</td>
<td>OLDEST</td>
</tr>
<tr>
<td>59</td>
<td>85</td>
<td>YOUNGEST</td>
</tr>
</tbody>
</table>
Appendix D  Con't.

<table>
<thead>
<tr>
<th>STUDENT</th>
<th>P-H P. R.</th>
<th>BIRTH ORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>85</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>61</td>
<td>87</td>
<td>OLDEST</td>
</tr>
<tr>
<td>62</td>
<td>87</td>
<td>OLDEST</td>
</tr>
<tr>
<td>63</td>
<td>89</td>
<td>YOUNGEST</td>
</tr>
<tr>
<td>64</td>
<td>91</td>
<td>OLDEST</td>
</tr>
<tr>
<td>65</td>
<td>91</td>
<td>OLDEST</td>
</tr>
<tr>
<td>66</td>
<td>91</td>
<td>YOUNGEST</td>
</tr>
</tbody>
</table>