1972

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Gary Eugene Popp
Louisiana State University and Agricultural & Mechanical College

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THE EFFECTS OF FAMILY ORDINAL POSITION ON
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The Effects of Family Ordinal Position on Managerial Level Attainment in the Petro-Chemical Industry

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy

in

The Department of Management

by

Gary Eugene Popp
B. B. A., Baylor University, 1963
M. B. A., Texas Technological University, 1966
December, 1972
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ACKNOWLEDGMENT

I wish to sincerely thank Dr. O. Jeff Harris for his invaluable assistance throughout this entire project. For his encouragement, time, and guidance, I am deeply grateful.

I am also thankful for the helpful suggestions and advice of the other members of my committee, Dr. Herbert G. Hicks, Dr. Raymond V. Lesikar, Dr. Eugene C. McCann, and Dr. Perry H. Prestholdt.

To those companies and managers who participated in the study, I am most indebted. Without their assistance, this project would never have been completed.

Lastly, I wish to thank my wife, Linda, whose patience, encouragement, and efforts meant so much to me.
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ABSTRACT

A study was conducted to determine whether there was a statistically significant difference in the probability of successful managerial achievement in the petro-chemical manufacturing industry between early-born and later-born managers. In addition, the biographical and career variables of age, years of managerial experience, functional areas of employment, formal educational levels, and early parental relationships of the respondents were analyzed for possible birth-order effects. Respondents included 440 male managers. Of the subjects, 181 were classified as first-line managers, 156 as middle managers, and 103 were in top management.

Only-born top managers were found to be significantly over-represented when compared to other ordinal positions. Only-born first-line managers were under-represented. Only-born middle managers were found to be neither over nor under-represented. First-born managers at all levels of management were found to be as statistically expected. No predicted birth-order effects were found in any family ordinal position other than only borns. The
findings suggested that the only born has a proportionally better chance of reaching top management in the petro-chemical manufacturing industry than any other birth order. The results also seem to indicate that while many similarities appear to exist in only and first borns, significant differences also seem to be present.

The biographical and career variables of age, years of managerial experience, and functional areas of employment did not reach acceptable statistical significance for any level of management. No birth-order effects were found at the .05 level of confidence. Only-born first-line managers appeared to be younger than either first-born or later-born first-line managers, but only at the .10 level of confidence in the overall analysis.

The variable, years of formal education, was found to be statistically significant in the predicted direction only for first-line managers. First and only-born first-line managers were found to have a significantly higher level of formal education than later-born first-line managers. Results for middle and top managers did not support the hypothesis of a higher mean level of formal education for early borns when compared to later borns. In addition, only-born first-line managers reported a significantly higher educational level than did first borns. Also, in the opposite direction, first-born top managers were significantly higher educated than only-born top managers.
A bi-polar adjective phrase scale was administered to measure the subjects' perceived early relationships with both the father and mother. The hypothesis predicting permissiveness, warmth, and higher expectations by parents for early borns was not supported. However, several significant findings were reported in an analysis for managerial level across all birth orders. A pattern emerged where it appeared that parents of higher level managers of all ordinal positions had higher expectations for the respondents, encouraged them more often, and showed affection and love more frequently than did parents of lower level managers.
CHAPTER I

INTRODUCTION

Much has been written concerning various differences between individuals born as only or first children and those born later in the family constellation. There is considerable support in research findings that the birth-order rank of a child has an effect on an individual's behavior in later life. Evidence has been offered in areas concerning higher achievement, higher affiliation needs and anxiety, higher dependency and conformity tendencies, and higher educational attainment, among other variables, for first and only borns as compared to later borns. In recent review articles, Altus¹ and Warren² summarize many of these findings.

It seems to be of more than passing interest to the student of business administration concerned with effective managerial achievement that 67 percent of the astronauts in the United States space


program are first or only children of their parents. A recent study has revealed that every one of the one hundred corporate presidents or senior vice presidents in an all-female survey were first-born or only children in their families. The large number of first or only borns in these two samples adds further support to long standing observations.

Sir Frances Galton nearly one hundred years ago gave attention to the achievement of only and first-born sons when he noted that more of this group were elected Fellows of the Royal Society than mere chance would allow. Since that time, some social scientists have exhibited a strong interest in discerning data concerning the effect of birth-order as a predictor of behavior. In the search for better guidelines for manpower selection, placement, motivation, and utilization, administrators have also come to have an interest in the findings related to adult behavior and earlier childhood factors. Perhaps early childhood factors relating to the birth-order rank can be translated into important guidelines for managerial action.

3National Aeronautics and Space Administration, personal letter, September, 1971.

4Based on a study by Margaret Hennig, Reported by Victor Reisel, "Inside Labor," Baton Rouge Sunday Advocate, September 19, 1971, p. 2B.

5Altus, "Birth Order and Its Sequelae," p. 44.
PURPOSE OF STUDY AND STATEMENT OF HYPOTHESES

Through years of exploration some evidence has been provided to help answer some of the questions raised about family ordinal position and its effect on achievement. Unfortunately, very few studies conducted previously have been concerned with managerial achievement in a business environment. Most studies in the past have used children, adolescents, and college students as subjects. It would appear reasonable to assume that, if first and only borns are more likely to obtain a higher level of achievement as measured by the traditional studies in non-business areas, this may also be the case when business achievement is measured. However, only one study, by Dubno, Bedrosian, and Freedman, utilized business managers working in an organizational setting as subjects. Clearly, additional and specific studies on ordinal rank and business achievement are needed. The present empirically-based project was attempted to add to the meager findings concerning birth-order effects on managerial achievement. In the present study, both the terms birth order and ordinal position refer to an individual's order of birth in his family in relation to siblings, such as only born, first born, or later

---

born. The phrase early born is used when only borns and first borns are combined together as one class.

The types of questions which this study attempted to answer are as follows:

1. Is there a statistically significant difference in the probability of successful managerial achievement in the petro-chemical industry between first and only borns and later borns?

2. If so, what are some possible explanations of why this might be the case?

3. If a relationship between managerial achievement and ordinal position is found, how does what we know about the behavioral patterns of successful managers coincide or conflict with the characteristics of first and only borns?

4. How are ordinal position and managerial success related to early relationships with parents?

5. How do the factors of age, educational level, years in a management position, and occupational area (line or staff) affect the probability of successful managerial achievement of first and only borns as opposed to later borns?

Managerial Achievement

The vast majority of evidence gathered by most researchers shows that only and first-born children tend to be more achievement-oriented than are their later-born counterparts. Early studies show the preponderance of first and only borns among eminent individuals who logically could be considered high-achievers. These include
American scientists,\textsuperscript{7} Italian university professors,\textsuperscript{8} American men of letters,\textsuperscript{9} an international group of eminent men,\textsuperscript{10} and listings of men and women occurring in the British Dictionary of National Biography.\textsuperscript{11}

Three later studies provide evidence of clear over-representation of first and only borns in Rhodes Scholars, Who's Who listings, and eminent scientists, respectively. Apperly,\textsuperscript{12} studying two-child families, found 144 first-born Rhodes Scholars and 91 second born, an uneven distribution. Jones's\textsuperscript{13} research data indicates that in Who's Who listings, 64 percent of those from two-child families

\textsuperscript{7}James M. Cattell and Dean R. Brimhall, American Men of Science (Garrison, New York: Science Press, 1921), pp. 802-804.


\textsuperscript{11}Havelock Ellis, A Study of British Genius (Boston: Houghton Mifflin Co., 1926), p. 103.


were first born. On chance alone, a 50-50 distribution would be expected. He also reported 52 percent of first borns in three-child families instead of the expected 33 percent. Roe\textsuperscript{14} noted 61 percent first borns among 64 eminent scientists selected on the basis of their contributions as evaluated by peers in their own academic area. Huntington's\textsuperscript{15} classic work studying 1,210 distinguished Americans supports the contention of high achievement for early borns. He found that in every family size, first borns were over-represented among high-achievers.

Stewart\textsuperscript{16} has shown an over-representation of first sons in an examination of ordinal positions of 258 American presidential and vice-presidential candidates. In two studies using college and high school subjects, Sampson\textsuperscript{17,18} concludes that first borns have a

\textsuperscript{14} Anne Roe, "A Psychological Study of Eminent Psychologists and Anthropologists, And a Comparison with Biological and Physical Scientists," \textit{Psychological Monograph No. 352}, 67, No. 2 (1953), p. 3.


\textsuperscript{18} Edward E. Sampson and Francena T. Hancock, "An Examination of the Relationship Between Ordinal Position, Personality, and Conformity," \textit{Journal of Personality and Social Psychology},
higher need for achievement than later borns. Also using student subjects, Weinberg\(^{19}\) found only and first-born children as over-represented as class leaders. Concerning sex differences, research by Rosenbluh and Haarman\(^{20}\) indicates that college male early borns tend to show more achievement orientation than female early borns. Their finding confirmed higher achievement motivation for first borns for males only. Dubno, Bedrosian, and Freedman,\(^{21}\) in a study directly related to business organizations, reviewed the organizational positions and birth ranks of top and middle managers. While they found no significantly higher percentage of first borns in top management, the data did reveal an over-representation of first borns among middle managers.

In summary, with most measures used only and first borns were found to be over-represented through traditional measures of achievement. This has been true for both overt and psychological measures. Therefore, the following hypotheses were proposed for


\(^{19}\)Carl Weinberg, "Family Background and Deviance or Conformity to School Expectations," \textit{Journal of Marriage and Family}, 26, No. 1 (February, 1964), pp. 89-91.


the present study, operationally measuring managerial achievement in business organizations by the management level attained.

Hypothesis 1: First-born managers will be over-represented as compared to later borns in first-line, middle, and top management positions.

Hypothesis 2: Only-born managers will be over-represented as compared to later borns in first-line, middle, and top management positions.

Hypothesis 3: The over-representation of first and only borns will be higher, the higher the level of management. That is, proportionally more first and only borns will be found in top management than in middle management positions. Likewise, proportionally more first and only borns will be found in middle management than in first-line management.

Hypotheses 1 and 2 predict an over-representation will be found in all levels of management for first and only borns. The third hypothesis is based on the contention that the higher the level of management, the more intense the achievement orientation required to attain the position. Therefore, proportionally more early borns will be found in each higher level of management. The above hypotheses are supported by previously cited data showing over-representation of first and only borns among high-achievers. McClelland's 22

contention that positions in business management are particularly appropriate to those individuals with a high achievement orientation would lead to the expectation, based on birth-order data, of an over-representation of first and only borns in those positions. According to McClelland, a career in business management provides the high-achiever with a situation uniquely suited to his desires and characteristics. These are:

1. The high-achiever "... likes situations in which he takes personal responsibility for finding solutions to problems."

2. The high-achiever has a "... tendency to set moderate achievement goals and to take 'calculated risks.'"

3. The high-achiever "... wants concrete feedback as to how well he is doing."

Ages and Years of Managerial Experience

Two additional biographical variables associated with birth-order data and achievement that are of interest are those of age and total number of years in a supervisory position. If first and only borns are higher achievers than later borns, one might expect the mean age of managers in each level of management to be lower for early borns. This would be the case based on the assumption that first and only borns obtain their managerial positions in a faster time period than later borns because of a higher drive for achievement. Therefore, early borns would be younger. One might also
expect, following this line of thought, that the early born would have a higher mean number of years of total managerial experience than those born later in each level of management. If only and first borns obtain their first management position at a younger age, this should result in a larger mean number of years of total managerial experience for those in early ordinal positions. The above discussion leads to the following hypotheses:

**Hypothesis 4:** First and only-born managers will have a lower mean age than later borns in each level of management.

**Hypothesis 5:** First and only-born managers will have a higher mean number of years of total managerial experience than later borns in each level of management.

**Functional Areas of Employment**

Another variable to be considered in this area is that of line and staff management positions. Allen\(^\text{23}\) defines line managerial position as "... those positions and elements of the organization which have responsibility and authority and are accountable for accomplishment of primary objectives." Further, Fox\(^\text{24}\) states that


"line positions in an organization are those concerned directly with the creation and distribution of salable utilities or with the management of such activity." In manufacturing firms, the areas of production, operations, and sales are generally regarded as line functions. Managers of these departments are considered line managers. Staff departments "... are regarded as auxiliary in nature ...," and these functions generally provide supportive services to the line departments. That is, staff departments and managers assist the line areas which more directly contribute to organizational objectives. Examples of areas usually considered to be staff departments in manufacturing firms are purchasing, security and plant protection, employee relations, technical services, accounting, and public relations. From the definitions of these two functions, it can be seen that the line positions provide for accountability of primary objectives and concrete feedback through measurement of organization's goals, two of the items McClelland mentions as important to high-achievers. These two factors appear more apparent in the definitions of line positions as contrasted with staff positions. If first and only borns are higher achievers than later

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26 McClelland, "Business Drive and National Achievement."
borns, and high-achievers desire accountability and concrete feedback, this leads to the following hypothesis:

Hypothesis 6: First and only-born managers will be over-represented in line management positions when compared to later borns in each level of management.

Formal Education

A very stable and consistent relationship has been found between birth order and college attendance. In studies of college students in Connecticut, Nebraska, Kansas, Florida, California, and Minnesota, early-born children significantly


exceed later borns in enrollment. Enrollment rates decreased regularly with each numerical position in the birth-order sequence. Schachter\textsuperscript{33} found an even stronger relationship among graduate students. This birth-order effect has also been found in medical students.\textsuperscript{34} Other recent evidence has been presented by McGlynn\textsuperscript{35} that supports the findings of a higher rate of college attendance among early borns. According to the consistent findings reporting an over-representation of early borns among college students, the following hypothesis was formulated:

Hypothesis 7: First and only-born managers will have completed a higher mean number of years of formal education than later borns in each level of management.

Testing the above hypothesis will assist in determining if the over-representation found on the college campus is also found in those persons working as managers. One would suspect this might be the case as business organizations are increasingly requiring a college education as a prerequisite for individuals seeking managerial

\textsuperscript{33}Ibid., p. 761.


positions. Additionally, colleges and universities are a major source of manpower for many business firms, and early borns have previously been shown to be over-represented in these educational institutions. Support for the above hypothesis in the present study would be another direct measure of higher achievement for early borns.

**Early Parental Relationships**

There are two different assumptions concerning the origins of birth-order effects. One is based on the study of physiological determinants. The other is concerned with family interaction patterns, a sociopsychological frame of reference. The present study is more concerned with and develops only the family interaction data. In Altus's opinion, "... the most prominent of the presumed social 'causes'..." why early borns are more likely to achieve eminence are:

1. Differential parental treatment accorded children of different ordinal positions.

2. Greater 'conscience' development.

3. Greater dependence on adult norms.

4. Higher expectations of achievement falling to the lot of the first born.

---

Clausen and Williams\textsuperscript{37} state that "the effect of ordinal position, as regards socialization experiences appeared to be the consequence of:

1. Parental attitudes and experiences--e.g., parents are more insecure and overly concerned with first borns.

2. Amount and intensity of parent-child interaction--e.g., parents are more available to first-born children because of fewer competing demands for time and attention.

3. Availability of child models in learning age and sex roles--e.g., boys with older brothers have pace-setters and models for appropriate behaviors.

4. Displacement of older siblings by new arrivals--e.g., there is greater intensity of displacement experienced by the eldest child who has had his parents to himself, possibly leading to greater dependency needs.

5. Effects of parental age, apart from those in Item 1, above (since first-born children have younger and last born, older parents).

The present study attempted, by administration of bi-polar adjective scale, to analyze the factors of achievement of managers and the relationship these individuals had with their parents when growing up. The scale measured a relationship of permissiveness-

warmth-high expectations as contrasted to one of restrictiveness-
distant- and low expectations.

Studies by Watson, Walsh, Jones, Kimball, and Kagan and Moss, among others, support the contention of a generally permissive attitude by parents as being related to higher achievement in the child. Contrary to these findings, Maccoby, Watson, and Drews and Teahan reported results in the opposite direction.

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Research by Bartlett and Smith\textsuperscript{46} indicates that parents tend to have higher levels of expectation for their first born. Further, they found that parents expressed disappointment with first-borns more often, and less often told them how much they loved them. With results somewhat different, Winterbottom\textsuperscript{47} and McClelland\textsuperscript{48} have found that restrictiveness in parents appears to be associated with lower Achievement. McClelland\textsuperscript{49} states that three extremes in child-rearing practices lower the achievement orientation of children. These are father dominance, low standards of excellence, and very early achievement demands by parents. He suggests that a pattern of reasonably high demands imposed when the child can attain them, a willingness not to interfere, a feeling of pleasure in the child's achievement, and a lack of over-protection and over-indulgence by parents are more likely to result in a higher achievement need in the child.


\textsuperscript{49}\textit{Ibid.}, p. 356.
The research evidence concerning child-rearing practices, and the resultant effects on a child's achievement orientation and accomplishments in later life is not consistent or entirely clear. However, based on the above discussion, the following hypothesis is present for testing:

Hypothesis 8: First and only-born managers will report a higher pattern of early parental relationships that reflect permissiveness, warmth, and higher expectations as contrasted with later borns.

In summary, the purpose of this study is to determine if first and only-born managers are over-represented in the petro-chemical industry and to test the following hypotheses:

Hypothesis 1: First-born managers will be over-represented as compared to later borns in first-line, middle, and top management positions.

Hypothesis 2: Only-born managers will be over-represented as compared to later borns in first-line, middle, and top management positions.

Hypothesis 3: The over-representation of first and only borns will be higher, the higher the level of management. That is, proportionally more first and only borns will be found in top management than in middle management positions. Likewise, proportionally more first and only borns will be found in middle management than in first-line management.

Hypothesis 4: First and only-born managers will have a lower mean age than later
borns in each level of management.

Hypothesis 5: First and only-born managers will have a higher mean number of years of total managerial experience than later borns in each level of management.

Hypothesis 6: First and only-born managers will be over-represented in line management positions when compared to later borns in each level of management.

Hypothesis 7: First and only-born managers will have completed a higher mean number of years of formal education than later borns in each level of management.

Hypothesis 8: First and only-born managers will report a higher pattern of early parental relationships that reflect permissiveness, warmth, and higher expectations as contrasted with later borns.

SCOPE AND LIMITATION

This study is confined to the petro-cheemical manufacturing industry. Male subjects for first-line and middle management were obtained from eleven large petro-chemical manufacturing firms---three in the Houston, Texas area, and eight in the Baton Rouge, Louisiana area. Top manager respondents were obtained in a national selected sample as explained in the next chapter and included the forty largest chemical and petroleum manufacturers.
One limitation of this project is that the results will only provide cues for further research concerning firms outside the petro-chemical manufacturing industry. Since the firms analyzed were among the largest in this industry, generalizations concerning small firms can only be tentatively proposed. Also, since only male subjects were used, statements about birth-order effects in females are limited.

An additional limitation is the geographical area in which the study was conducted. Generalizations to other areas will be limited for findings of first-line and middle managers.

The last limitation concerns data not obtained for this study. This includes such items as socio-economic background, sex of siblings, and spacing of siblings that may relate to birth-order effects. The author will be unable to analyze the effects of these variables in the present study.

PREVIEW

Chapter II gives a detailed explanation of the methodology used and describes the subjects, the questionnaire, and the procedure used in gathering the data. Chapter III presents the findings of the study, and Chapter IV analyzes this data, compares the proposed hypotheses with the findings, and suggests implications for
management. Finally, Chapter V includes the summary of the entire project and provides suggestions for future research.
CHAPTER II

METHODOLOGY

This study was conducted to determine the effects, if any, of family ordinal position on managerial success in the petro-chemical manufacturing industry. Additionally, certain biographical variables of the respondents were analyzed to determine their effect on the relationship between ordinal position and managerial achievement. Data were also analyzed concerning the early parental relationships of the respondents. Characteristics of the respondents are discussed in this chapter. The construction and administration of the instrument used to collect the data is then discussed. Lastly, a detailed explanation of the procedure followed in this study is presented.

THE SUBJECTS

Respondents were drawn from a sample of managers of various hierarchical levels from the petro-chemical manufacturing industry. The respondent managers were classified into one of three managerial levels: first-line managers, middle managers, or top managers. Because this study was conducted in the petro-chemical
manufacturing industry, the results only provide possible cues for further research concerning firms in other industries.

The section of the study that was originally planned to analyze women respondents was adversely affected by the fact that no female subjects were found in the sample of managers from this industry. The reasons for this situation were several and varied and were found in part because of tradition in this industry, lack of opportunities for women, female sex role expectations, and the positions involved.

Because of the concentration of the type of industry studied in these areas, first-line and middle management subjects were drawn from participating petro-chemical manufacturing firms in the Baton Rouge, Louisiana, and Houston, Texas areas. In addition to firms in the above areas, some respondents were selected from the Dun and Bradstreet's Reference Book of Corporate Managements.¹ Virtually all of the top managers' responses were obtained by mail from addresses taken from this source because of the wide geographical distribution of this type and level of personnel. Personal visits to firms by the author were impractical in the case of top management subjects. High level managers of the forty largest chemical and petroleum manufacturers as classified by Standard Industrial Classification (SIC) numbers as established by the United States

Department of Commerce and found in *25,000 Leading U.S. Corporations*² were selected in this instance for mail sampling. The necessary sample of first-line and middle managers was obtained from firms in the Baton Rouge, Louisiana, and Houston, Texas locations.

Classification of managerial levels was as follows: Top managers were considered as any respondent with the title of chairman of the board, vice chairman of the board, chief executive officer, president, vice president, or equivalent. Classification at the top managerial level was facilitated by the fact that the author knew beforehand the range of titles of the mail respondents as they were taken from the *Reference Book of Corporate Managements*.³

Middle managers, to be classified such for this study, must have directly supervised and had reporting to them one or more persons who met the criteria for a first-line manager or a lower level middle manager. This level ranged from the second line of supervision to the plant manager. Representative of the middle management level were plant managers, assistant plant managers, area managers, superintendents, department managers, and in many cases, assistant department managers.

---


First-line managers included the first level of supervision with direct supervisory responsibility for at least one non-supervisory subordinate. Workers who may perform some types of managerial duties, such as a processing unit chief operator who is normally a member of a collective bargaining unit, were not considered as first-line managers in this study. First-line managers in the production or operations departments in this industry are usually called unit or shift foremen or supervisors and are responsible for the operations of one or more processing facilities. First-line managers in areas other than production or operations include a wide range of activities and departments, and their specific responsibilities vary. These first levels of supervision are generally classified as exempt employees, and usually these managers do not belong to a collective bargaining unit.

Data obtained from the questionnaire concerning the managerial level, title, number, and type of personnel supervised, and the nature of duties performed facilitated the classification of managers by level. Line managers as defined in this study included managers working in the areas of production, operations, sales, or equivalent departments. Staff managers were considered as managers working in areas other than those listed above. These included such functions as purchasing, employee and industrial relations,
mechanical services, technical services, accounting, and public relations.

Table I presents respondent biographical and career variables by managerial level. From a total response of 440, first-line managers represented the largest group with 181 subjects. Middle managers numbered 156 of the total respondents, and 103 were top managers.

The mean age of first-line, middle, and top managers was 45.6, 44.4, and 52.6, respectively. Lower level managers were 1.2 years of age older than those in the middle levels. The largest differences in mean age were found in the highest managerial level. Top managers were 8.2 years older than those in the middle ranks and 7 years older than first-line managers. The large contrast in age between the highest and other levels of management may be explained in part by tradition and role requirements in business organizations. Top managerial positions, because decisions made in these areas are vital to a firm's success, generally require many years of business and managerial experience in more than one functional area, thus resulting in the reported differences.

The variable mean years of formal education were measured by assigning a value of 12 to represent a successfully completed high school education. Each year of college successfully completed was assigned a value of 1, up to a total of 16, which represented an
<table>
<thead>
<tr>
<th>Variable</th>
<th>First-Line Managers</th>
<th>Middle Managers</th>
<th>Top Managers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Respondents</td>
<td>181</td>
<td>156</td>
<td>103</td>
</tr>
<tr>
<td>Mean Age in Years</td>
<td>45.6</td>
<td>44.4</td>
<td>52.6</td>
</tr>
<tr>
<td>Mean Years of Formal Education</td>
<td>13.3</td>
<td>15.9</td>
<td>16.7</td>
</tr>
<tr>
<td>Mean Years of Total Managerial Experience</td>
<td>9.2</td>
<td>14.3</td>
<td>23.3</td>
</tr>
<tr>
<td>Managerial Function:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line</td>
<td>57</td>
<td>67</td>
<td>63</td>
</tr>
<tr>
<td>Staff</td>
<td>124</td>
<td>89</td>
<td>40</td>
</tr>
</tbody>
</table>
earned Bachelor's degree. An earned Master's degree was assigned the value of 18. Each year of graduate study beyond the Master's degree was assigned a value of 1, with 21 indicating an earned Doctor's degree.

In the respondents, mean years of formal education increased in a linear relationship with the level of management. First-line managers reported 13.3 years of formal education, representing slightly more than one year of college completed. Middle managers reported a mean level of 15.9 years, 2.6 years higher than the lowest level of management. Almost every middle manager had earned a Bachelor's degree. Top managers had completed the highest mean level of formal education with 16.7 years, representing almost one year of graduate study.

This educational trend is not surprising as it has become increasingly necessary to have obtained higher levels of education to advance into the more responsible managerial positions available in business firms. Many first-line management positions in this industry are, however, still available to those without the benefit of a college education. This is indicated in this group's relatively lower level of educational attainment.

The variable mean years of total managerial experience followed a pattern similar to that of education, increasing with each management level. First-line managers had the least experience,
with a mean level of 9.2 years. Middle management subjects reported a mean of 14.3 years of total managerial experience, 5.1 additional years than first-line managers. Top managers indicated the highest total years of previous experience, averaging 23.3 years. This was 14.1 more than the lowest group and 9 years over the middle rank. These statistics reflect a situation where it appears necessary to gain additional experience as a person progresses to higher levels of management.

Of the total respondents, 187 were working in line functions while 253 had staff positions. Fifty-seven of the first-line subjects were classified as line managers, and 124 were considered as employed in the staff areas. Middle management subjects numbered 67 employed in line jobs, and 89 from the staff positions. Of the top managers reporting, 63 worked in line departments, and 40 were engaged in staff activities.

In summary, of the total 440 subject managers, 181 were first-line, 156 worked in the middle management area, and 103 held top management positions. The mean age was 45.6 years for first-line managers, 44.4 years for middle managers, and 52.6 years at the highest level. Mean years of formal education increased with an increase in the managerial level from 13.3 years to 15.9 years, and finally rising to 16.7 years for top managers. Mean years of total managerial experience followed a similar pattern, showing 9.2
years for the lowest level and 14.3 years for the middle area. Top
managers had the highest mean reporting 23.3 years of previous
experience. Classification by managerial function indicated a total
of 187 line managers and 253 staff managers.

THE QUESTIONNAIRE

The questionnaire used in this study is found in Appendix A.
The first page of the questionnaire is a cover letter that explains the
purposes of the study, states generally how the information provided
would be analyzed and used, and requests the respondent's participa-
tion. This section also provides instructions on returning the com-
pleted instrument. The names of respondents were not requested
on the questionnaire as it was not necessary for the purposes of this
study. Moreover, it was felt by the author that subjects may be
more inclined to participate in the project if individual identification
by name was not requested.

The second page of the instrument contained biographical and
job-related questions concerning age level, sex of the subject, edu-
cational level attained, number of years worked, number of years
spent in the present and other managerial positions, and other back-
ground information. Responses to questions in this section also
provided information concerning the subject's managerial level as
well as specific ordinal position and family size data. In total,
answers to thirteen biographical and career questions, some with more than one part, were requested in this section.

The third page provided detailed instructions for respondents in completing the final section of the questionnaire, the bi-polar adjective scales. These instructions were adopted from Osgood, Suci, and Tannenbaum\(^4\) and provided several examples on completing the scales under a variety of conditions. The final section of the instrument, the bi-polar adjective phrase scales, requested information concerning the respondent's early childhood relationships with his parents. Seven different response possibilities along a continuum of two extremes were provided with each pair of the twelve bi-polar adjective scales used. Information was obtained separately for the subject's relationship concerning both the father and mother, using identical scales for each.

Because previously used and validated scales appropriate to the present study were unavailable from other sources, the scales were developed by the author. Preparations for this development included reviews of textbooks and previous studies in child development and child psychology, consultations with development and social psychologists, discussions with the author's chairman and others

serving on his doctoral committee, and study of birth-order and family constellation data. Care was taken to provide theory-based scales relevant to previously published studies of child-rearing practices as these related to family constellation interactions, ordinal position research, and attainment of achievement.

The questionnaire used in this study was constructed to be easily understood and completed by the respondents as well as to provide the maximum amount of data relevant to the variables studied. The instrument used was pre-tested using as subjects a group of twenty-six professional employees in a manufacturing department of a petro-chemical firm located in Baton Rouge, Louisiana. The researcher attempted to administer the questionnaire under conditions as similar as possible to those it was expected other subjects in the larger study would encounter. The time necessary for the pre-test respondents to read the cover letter, complete the necessary items, and place the completed instrument in the provided envelope varied from eight to slightly over ten minutes. Mean completion time was between nine and ten minutes. It was felt that this was not an unreasonable time burden to request of individuals. Six employees from the pre-test group were made available for a discussion with the author that lasted for approximately one-half hour. The subjects indicated that the instructions provided and information requested were clear and that others in circumstances similar to themselves
should have little difficulty in completing the questionnaire. Special precaution was taken by the researcher to determine if the bi-polar adjective scales were clear and understandable as well as a reasonable type of data to request from individuals. Such proved to be the case. The subjects indicated understanding and ease in completing the entire instrument. No major changes resulted in the questionnaire from information gained from these employees.

THE PROCEDURE

To obtain first-line and middle managerial respondents, a personal visit by the researcher was conducted with an officer of selected sample firms in the Baton Rouge, Louisiana, and Houston, Texas areas. Usually the person contacted held the title of Personnel Manager or Industrial Relations Manager. This visit served to introduce and explain the study, its purposes, and potential benefits to participating firms.

The official contacted usually found it necessary after the initial discussion to secure approval for participation in the study from the plant's manager. After this permission had been granted by the person making that decision, the author delivered the necessary number of questionnaires and properly identified return envelopes to the contact person. Individual managers received the questionnaires and return envelopes from the contact person at
each location. The firms usually included with the instrument and envelope a memorandum explaining the company's participation. After providing the data requested, each respondent returned the completed instrument, either personally or by in-plant mail, to the contact person at each firm.

The instructions for returning the questionnaire were provided in the cover letter. This method served to protect the anonymity of any specific subject from others in the company, thereby hopefully adding to the response rate. After all of the forthcoming responses were returned to the contact person of a participating firm, the author collected the completed questionnaires in a follow-up visit.

The above procedure was utilized for all but two of the organizations sampled to obtain first-line and middle management subjects. Officials of these two firms preferred that their employees return the completed questionnaires by United States mail directly to the researcher. To secure the cooperation of these two firms in the study, this request was carried out. The direct return of the instrument in these two cases was the only alteration in the procedure previously described. In each cooperating firm with the exception of two, both first-line and middle management employees at a specific company location were included as respondents. One firm supplied
only middle management subjects while the other limited their cooperation to first-line managers.

As previously mentioned in another section, it was necessary to obtain information by use of a mail survey for a sufficient number of top management respondents. Very few of this level of personnel were available in the Baton Rouge, Louisiana, or Houston, Texas areas. From the Dun and Bradstreet publication previously discussed, a selected sample of top managers was chosen from the largest forty chemical and petroleum manufacturers. The subjects selected from the listings were all the entries found at the vice presidential or higher rank in each of the companies. Subjects in the above categories that were chosen not to be used were those with a title that also included that of secretary, treasurer, comptroller, and controller. It was felt the group was atypical of the remainder of those listed. In addition, individuals with a biographical reference in the sampling source indicating birth in a foreign country were excluded.

Each completed questionnaire received was given a control number by the author to monitor the incoming data. Respondent information from each instrument was also recorded on a summary sheet to facilitate tabulating and analysis of the data. This summary

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sheet is found in Appendix B. Respondents indicating the absence of one or both parents for a variety of reasons for a prolonged period during early childhood were not included in the analysis of data. Likewise, incomplete responses were also eliminated. These un-useable responses accounted for 5.4 percent of the total questionnaires sent out for all levels of management. Useable response rate for first-line and middle managers was 54.3 percent. Top managers contacted in the mail survey returned 25.7 percent useable responses of the total mailed.

Chi-square independence of classification analyses were calculated for a measure of over-representation of first and only-born respondents as compared to later borns at each managerial level. In the present study, the method of calculating the expected frequencies used in the chi-square contingency tables reflects the sample previously defined. Line and staff classifications were also tested using chi-square analysis. A two-way analysis of variance was performed to analyze responses concerning the biographical and career variables and the bi-polar adjective scales. The results of these analyses are reported in the following chapter.
CHAPTER III

RESULTS OF THE STUDY

Statistical results of the data in the present study are presented in this chapter. Interpretations and analyses of the results will not be attempted in this section but will appear in Chapter IV. The results of the data appear in the same order of the hypotheses presented in Chapter I.

Results for Over-Representation of Early-Born Managers

The first three hypotheses are best considered together. Hypotheses 1 and 2 predicted that first-born and only-born managers would be statistically over-represented when compared to later borns in first-line, middle, and top management positions. The third hypothesis proposed that proportionally more first and only borns would be found as the management level increased. That is, proportionally more early borns would be present in top than in middle management jobs. Likewise, proportionally more early borns would be found in middle than in first-line management. To test these hypotheses, a
series of chi-square independence of classification analyses were conducted. Table II shows the initial arrangement for the analysis of the data, a three by three chi-square table. This method provided for overall comparison by each management level and birth-order classification studied.

The top area of each cell in Table II indicates the observed frequencies obtained in the collection of data from the subjects. Expected frequencies are shown in the bottom half of each cell. The expected frequencies were obtained by multiplying the percentage of the total subjects of each observed row by the appropriate observed column total. Chi-square values for each cell were obtained by calculating the sum of the observed frequency minus the expected frequency squared and then divided by the expected frequency.\(^1\) Chi-square values for each cell are shown in parenthesis. This procedure resulted in a total chi-square value of 9.72, which was significant at the .05 level of confidence. This indicated that the birth orders of the subject managers were not independent of managerial level. Major contributing cells to the significance at the .05 level of confidence in this case were only-born first-line managers and only-born top managers. These results indicated an under-representation

### TABLE II

CONTINGENCY TABLE FOR BIRTH ORDERS AMONG FIRST-LINE, MIDDLE, AND TOP MANAGERS

<table>
<thead>
<tr>
<th></th>
<th>First-Line Managers</th>
<th>Middle Managers</th>
<th>Top Managers</th>
<th>Totals</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only Born</td>
<td>12</td>
<td>18</td>
<td>18</td>
<td>48</td>
<td>.109</td>
</tr>
<tr>
<td></td>
<td>19.8 (3.08)</td>
<td>17.0 (.06)</td>
<td>11.2 (4.13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>52</td>
<td>51</td>
<td>31</td>
<td>134</td>
<td>.305</td>
</tr>
<tr>
<td></td>
<td>55.2 (.19)</td>
<td>47.6 (.24)</td>
<td>31.4 (.01)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Born</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Later Born</td>
<td>117</td>
<td>87</td>
<td>54</td>
<td>258</td>
<td>.586</td>
</tr>
<tr>
<td></td>
<td>106.1 (1.12)</td>
<td>91.4 (.21)</td>
<td>60.4 (.68)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTALS</td>
<td>181</td>
<td>156</td>
<td>103</td>
<td>440</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Chi-square = 9.72, Level of Significance = .05, Degrees of Freedom = 4.
of only-born managers in the first-line classification and an over-
representation of only-born top managers from that which would be
statistically expected.

Additional orthogonal chi-square analyses were performed to
test the indicated tendencies found in the overall analysis. Since it
appeared from inspecting the above results that the only-born man-
agers were the major contributors to the significant findings, this
classification was tested against the other two classifications of birth
order combined to isolate the significant cells. This analysis is
found in Table III. The total chi-square value was calculated and
resulted in a value of 8.08, which is significant at the .02 level of
confidence. This analysis confirmed the tendency found in Table I
and further suggests the differences are only found in only-born
managers. Again, only-born first-line managers were found to be
under-represented while only-born top managers were over-repre-
sented from what would be statistically expected.

The hypotheses found in Chapter I predicted an over-repre-
sentation would be found in first born as well as only-born managers.
The over-representation of only borns has been supported above in
the case of top managers. To test for this effect in first-born man-
agers, a final orthogonal chi-square analysis was calculated. This
analysis is found in Table IV, which compares first-born managers
with later-born managers. The results of this analysis were not
TABLE III

CONTINGENCY TABLE FOR ONLY BORNS
AS COMPARED TO ALL OTHER BIRTH ORDERS
AMONG FIRST-LINE, MIDDLE, AND TOP MANAGERS

<table>
<thead>
<tr>
<th></th>
<th>First-Line Managers</th>
<th>Middle Managers</th>
<th>Top Managers</th>
<th>Totals</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Only Born</strong></td>
<td></td>
<td></td>
<td></td>
<td>48</td>
<td>.109</td>
</tr>
<tr>
<td>12</td>
<td>19.7</td>
<td>17.0</td>
<td>11.2</td>
<td>181</td>
<td>.109</td>
</tr>
<tr>
<td></td>
<td>(3.01)</td>
<td>(.06)</td>
<td>(4.13)</td>
<td>181</td>
<td>.109</td>
</tr>
<tr>
<td><strong>All Other</strong></td>
<td></td>
<td></td>
<td></td>
<td>392</td>
<td>.891</td>
</tr>
<tr>
<td><strong>Birth-Order</strong></td>
<td></td>
<td></td>
<td></td>
<td>440</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Positions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>169</td>
<td>161.3</td>
<td>139.0</td>
<td>91.8</td>
<td>181</td>
<td>.109</td>
</tr>
<tr>
<td></td>
<td>(.37)</td>
<td>(.01)</td>
<td>(.50)</td>
<td>181</td>
<td>.109</td>
</tr>
</tbody>
</table>

Chi-square = 8.08, Level of Significance = .02,
Degrees of Freedom = 2.
TABLE IV

CONTINGENCY TABLE FOR FIRST BORNS AS COMPARED TO LATER BORNS AMONG FIRST-LINE, MIDDLE, AND TOP MANAGERS

<table>
<thead>
<tr>
<th></th>
<th>First-Line Managers</th>
<th>Middle Managers</th>
<th>Top Managers</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Born</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>51</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>57.8 (.58)</td>
<td>47.2 (.31)</td>
<td>29.0 (.14)</td>
<td></td>
</tr>
<tr>
<td>117</td>
<td>87</td>
<td>54</td>
<td>258</td>
</tr>
<tr>
<td>111.2 (.30)</td>
<td>90.8 (.16)</td>
<td>56.0 (.07)</td>
<td></td>
</tr>
<tr>
<td>Later Born</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTALS</td>
<td>169</td>
<td>138</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>392</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>

Chi-square = 1.56, Level of Significance = .50, Degrees of Freedom = 2.
statistically significant at the .05 level of confidence. The total chi-square value was 1.56. This indicated that first-born managers were not statistically over-represented when compared to managers born later in the family constellation.

In summary, only borns at the top management level were found to be significantly over-represented as compared to other birth-order positions. These findings only partially support the first three hypotheses that suggested an over-representation for both first-born and only-born managers in each level of management. This position was confirmed for only-born top managers but was not found in first-born managers in any of the three levels of management studied. No birth-order effect was found for first-line or middle managers in any birth-order position.

Results for the Age Variable

Hypothesis Four suggested that first and only-born managers would have a lower mean age than later borns in each level of management. A two-way analysis of variance with birth order and managerial level as the independent variables and age as the dependent variable was conducted to test this relationship. In this, as well as the other analysis of variance tests reported in this section, the analysis was corrected for samples of unequal size.
The mean age levels of the respondents are listed in Table V. The results of the analysis are found in Table VI. The analysis of the mean age level by birth position resulted in an F-ratio of 2.51 and did not reach the required .05 level of significance although it was significant at the .10 level. Because ordinal position did not reach the generally accepted .05 level of confidence in the overall analysis, no specific comparisons of mean age by birth order at each managerial level were conducted.

It can be seen from Table VI that the mean age combining all birth-order positions was significant for management level at the .01 level of confidence with an F-ratio of 28.42. This would be expected, and this finding provides no new information as mean age is assumed to increase as a person moves up the managerial hierarchy. Therefore, no specific comparisons for the age variable combining all birth-order positions in each management level were performed. Additionally, the analysis of the interaction of the ordinal position and managerial level variables with the dependent age variable resulted in an F-ratio of 1.09, which was not significant at the .05 level of confidence.

In summary, Hypothesis Four was not supported in this study, and the null hypothesis must be accepted. Mean age level for first and only-born managers was found not to be significantly different
<table>
<thead>
<tr>
<th></th>
<th>First-Line Managers</th>
<th>Middle Managers</th>
<th>Top Managers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only Born</td>
<td>40.5</td>
<td>44.2</td>
<td>53.1</td>
</tr>
<tr>
<td>First Born</td>
<td>45.1</td>
<td>43.8</td>
<td>50.7</td>
</tr>
<tr>
<td>Later Born</td>
<td>46.4</td>
<td>44.8</td>
<td>53.5</td>
</tr>
</tbody>
</table>
TABLE VI

ANALYSIS OF VARIANCE FOR AGE VARIABLE
BY BIRTH ORDER, MANAGERIAL LEVEL, AND INTERACTION

<table>
<thead>
<tr>
<th>Source</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth order</td>
<td>2</td>
<td>174.95</td>
<td>2.51</td>
</tr>
<tr>
<td>Managerial level</td>
<td>2</td>
<td>1981.10</td>
<td>28.42**</td>
</tr>
<tr>
<td>Interaction</td>
<td>4</td>
<td>76.05</td>
<td>1.09</td>
</tr>
<tr>
<td>Error</td>
<td>431</td>
<td>69.7</td>
<td></td>
</tr>
</tbody>
</table>

**Level of Significance = .01
than later-born managers. The age variable in this study was not affected by the birth position of the respondents.

Results of Total Years of Managerial Experience Variable

Hypothesis Five predicted that first and only-born managers would have a higher mean number of years of total managerial experience than later borns in each level of management. To statistically test this proposal, a two-way analysis using the total number of years of managerial experience as the dependent variable was performed. Mean levels for this variable classified by ordinal position and managerial level are found in Table VII. The results of the analysis are found in Table VIII.

As can be seen in Table VIII, mean years of previous managerial experience was not related to the birth positions of the respondents. This analysis, with an F-ratio of 1.92, failed to reach the .05 level of confidence. Therefore, Hypothesis Five was not supported in the present study. Although managerial level combining all birth-order classifications was found to be significant at the .01 level of confidence with an F-ratio of 77.97 for this variable, this finding provides us with little useful information. It would appear obvious that subjects in the higher levels of management would have more years of managerial experience than those respondents in the lower management levels. Few, if any, managers begin their
TABLE VII

MEAN LEVELS OF TOTAL NUMBER OF YEARS OF MANAGERIAL EXPERIENCE BY BIRTH ORDER AND MANAGERIAL LEVEL

<table>
<thead>
<tr>
<th>Birth Order</th>
<th>First-Line Managers</th>
<th>Middle Managers</th>
<th>Top Managers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only Born</td>
<td>9.0</td>
<td>14.4</td>
<td>26.4</td>
</tr>
<tr>
<td>First Born</td>
<td>9.4</td>
<td>12.7</td>
<td>21.3</td>
</tr>
<tr>
<td>Later Born</td>
<td>9.1</td>
<td>15.2</td>
<td>23.4</td>
</tr>
</tbody>
</table>
TABLE VIII

ANALYSIS OF VARIANCE FOR TOTAL NUMBER OF YEARS OF MANAGERIAL EXPERIENCE VARIABLE BY BIRTH ORDER, MANAGERIAL LEVEL, AND INTERACTION

<table>
<thead>
<tr>
<th>Source</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth order</td>
<td>2</td>
<td>11299.64</td>
<td>1.92</td>
</tr>
<tr>
<td>Managerial level</td>
<td>2</td>
<td>458711.10</td>
<td>77.97**</td>
</tr>
<tr>
<td>Interaction</td>
<td>4</td>
<td>7049.29</td>
<td>1.19</td>
</tr>
<tr>
<td>Error</td>
<td>431</td>
<td>5883.51</td>
<td></td>
</tr>
</tbody>
</table>

**Level of Significance = .01
careers in the higher levels of management but progress from the lower to higher levels through promotions over a number of years. Because the overall analysis failed to show any significant relationship between mean number of years of previous managerial experience and birth order, no additional analyses of this variable were conducted. Additionally, no interaction effect for this variable was found.

In summary, mean years of previous managerial experience was found to be independent of the ordinal positions of the subject managers in the present study. Hypothesis Five was not supported. Therefore, the null hypothesis of no significant differences by birth order was accepted for the variable mean years of previous managerial experience.

Results for the Line/Staff Classification Variable

Hypothesis Six predicted that first and only-born managers in the present study would be over-represented in line management positions when compared to later borns in each level of management. To test this proposed relationship an independence of classification chi-square analysis was performed comparing the number of line and staff managers classified by ordinal position found in the present sample. As in the previously reported chi-square analyses, the observed frequencies are found in the upper portion of each cell
while the expected frequencies are located in the lower section. Individual chi-square values for each cell are placed in parenthesis. This analysis is found in Table IX.

As can be seen from Table IX, the total chi-square value was calculated to be .70, far short of that required for significance at the .05 level of confidence. According to these results, Hypothesis Six was not supported in the present study. First and only-born managers were not found to be over-represented in line management positions when contrasted with later borns. Functional areas of employment reported by the respondent managers classified as either line or staff positions were found to be independent of birth-order position. Because the overall analysis was not statistically significant, further analyses by birth order among specific managerial levels were not calculated.

Results for the Education Variable

Hypothesis Seven predicted that first and only-born managers in the present study would have completed a higher mean number of years of formal education than later borns in each level of management. To test this statement a two-way analysis of variance was performed. Mean levels for the education variable classified by ordinal positions and management levels are found in Table X. The results of the analysis are found in Table XI.
## TABLE IX

CONTINGENCY TABLE FOR LINE AND STAFF MANAGEMENT POSITIONS AMONG ONLY, FIRST, AND LATER-BORN MANAGERS

<table>
<thead>
<tr>
<th></th>
<th>Only Born</th>
<th>First Born</th>
<th>Later Born</th>
<th>Totals</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Managers</td>
<td>18</td>
<td>56</td>
<td>113</td>
<td>187</td>
<td>.425</td>
</tr>
<tr>
<td></td>
<td>20.4 (.28)</td>
<td>57 (.02)</td>
<td>109.7 (.10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff Managers</td>
<td>30</td>
<td>78</td>
<td>145</td>
<td>253</td>
<td>.575</td>
</tr>
<tr>
<td></td>
<td>27.6 (.21)</td>
<td>77.1 (.01)</td>
<td>148.3 (.08)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTALS</td>
<td>48</td>
<td>134</td>
<td>258</td>
<td>440</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Chi-square = .70, Level of Significance = .80, Degree of Freedom = 2.
TABLE X

MEAN LEVELS OF FORMAL YEARS OF EDUCATION
BY BIRTH ORDER AND MANAGERIAL LEVEL

<table>
<thead>
<tr>
<th></th>
<th>First-Line Managers</th>
<th>Middle Managers</th>
<th>Top Managers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only Born</td>
<td>15.3</td>
<td>15.8</td>
<td>16.3</td>
</tr>
<tr>
<td>First Born</td>
<td>13.8</td>
<td>15.9</td>
<td>17.3</td>
</tr>
<tr>
<td>Later Born</td>
<td>12.9</td>
<td>15.9</td>
<td>16.5</td>
</tr>
</tbody>
</table>
TABLE XI

ANALYSIS OF VARIANCE FOR EDUCATION VARIABLE BY BIRTH ORDER, MANAGERIAL LEVEL, AND INTERACTION

<table>
<thead>
<tr>
<th>Source</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth order</td>
<td>2</td>
<td>18.40</td>
<td>5.56**</td>
</tr>
<tr>
<td>Managerial level</td>
<td>2</td>
<td>157.46</td>
<td>47.60**</td>
</tr>
<tr>
<td>Interaction</td>
<td>4</td>
<td>16.27</td>
<td>4.92**</td>
</tr>
<tr>
<td>Error</td>
<td>431</td>
<td>3.31</td>
<td></td>
</tr>
</tbody>
</table>

**Level of Significance = .01
As noted in Table XI, the mean level of formal education was found to be significant for birth order, managerial level, and the interaction between birth order and managerial level at the .01 level of confidence. The F-ratios for these three areas were 5.56, 47.60, and 4.92, respectively. Since an interaction effect was noted, specific comparisons of the education variable among birth-order sequence at the three levels of management studied were calculated to isolate the specific significant areas. Results of the analysis are recorded in Table XII. Specific comparisons were made contrasting first and only borns combined with later-born managers. Additionally, only borns were contrasted with first-born managers. These comparisons were made separately for each level of management.

Significant results at the .01 level of confidence were noted for both comparisons for first-line managers. Taken together as a class, only and first-born managers had a significantly higher mean level of formal education than later borns. The F-ratio for this analysis was 34.89. Compared separately, only-born first-line managers had a significantly higher mean level of formal education than first borns, with a resulting F-ratio of 11.83. The mean level of formal education for first-line managers was 15.3 years for only borns, 13.8 years for first borns, and 12.9 years for later borns.

The same two comparisons made above for first-line managers were also calculated for middle managers. The results were
### TABLE XII

SPECIFIC COMPARISONS OF MEAN YEARS OF FORMAL EDUCATION AMONG BIRTH-ORDER SEQUENCE AT THREE LEVELS OF MANAGEMENT

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Management Level</th>
<th>F-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Later vs. Only and First Born</td>
<td>First-Line</td>
<td>34.89**</td>
</tr>
<tr>
<td>Only vs. First Born</td>
<td>First-Line</td>
<td>11.83**</td>
</tr>
<tr>
<td>Later vs. Only and First Born</td>
<td>Middle</td>
<td>.02</td>
</tr>
<tr>
<td>Only vs. First Born</td>
<td>Middle</td>
<td>.06</td>
</tr>
<tr>
<td>Later vs. Only and First Born</td>
<td>Top</td>
<td>.55</td>
</tr>
<tr>
<td>Only vs. First Born</td>
<td>Top</td>
<td>3.87*</td>
</tr>
</tbody>
</table>

*Level of Significance = .05  
**Level of Significance = .01
not significant at the .05 level of confidence in either case. The
F-ratio for the comparison of the two classes of early borns com-
bined against later borns was .02. When only borns were compared
against first borns, the resulting F-ratio was .06. Mean levels of
formal education for middle managers varied only one-tenth of a
year between birth-order positions. Only-born middle managers
reported a mean level of formal education of 15.8 years while first
and later borns both reported means of 15.9 years.

The last set of specific comparisons calculated were among
top managers. When first and only borns were combined and com-
pared with later-born managers, the resulting F-ratio was .55,
which was not significant at the .05 level of confidence. However,
when only borns were contrasted with first borns, a significant dif-
ference at the .05 level of confidence was found. First-born top
managers, with a mean level of formal education of 17.3 years, were
significantly higher in this variable than only borns, who reported a
mean of 16.3 years. This latter comparison resulted in an F-ratio
of 3.87.

In summary, the prediction of a higher mean level of formal
education for early borns was partially supported. Taken together
as a class, only and first-born managers in first-line management
reported a significantly higher mean level of formal education than
did later borns. Additionally, only borns in this category indicate
a significantly higher mean level than first borns. No differences were found in specific comparisons among middle managers. First-born top managers were found to have a significantly higher mean level of formal education than only-born top managers. No differences were noted when comparing early borns combined against later borns in the highest level of management.

Results for the Bi-Polar Adjective Phrases

An exploratory portion of the present study attempted to determine if the respondent's ordinal position affected the subject's early childhood relationship with his parents. Hypothesis Eight suggested that first and only-born managers would report a higher pattern of early parental relationships that reflected permissiveness, warmth, and higher expectations as contrasted with later borns. To test this prediction, a two-way analysis of variance was conducted separately for each of the twelve areas of the bi-polar adjective phrases for both the father and the mother. Because of the large number of separate analyses required in testing these hypotheses, only results significant at the .05 level of confidence or higher will be discussed in detail. The results are reported separately for each parent. The twelve items in each scale for both the father and mother are numbered from Q1 to Q12, numbered from the top of the scales to the bottom, to facilitate discussion of the results of
this variable. Each of the specific bi-polar adjective phrases will be referred to in this manner in this section. For this analysis, each of the seven choices available concerning each item was numbered from one to seven, from the left to the right. The lower the mean level for a specific phrase, the stronger the indication of a relationship of permissiveness, warmth, and higher expectations.

**Results of Reported Relationships with the Father**

As can be seen in the summary of results provided in Table XIII, birth order was not significant at the .05 level of confidence in any of the twelve areas of relationships with the father. Three items, Q1, Q11, and Q12 were significant at the .10 level of confidence, however. Significant findings were limited to managerial level and the interaction between birth order and managerial level.

Item Q1, which concerned perceived expectations of the father toward the respondent, was significant at the .05 level of confidence for management level with an F-ratio of 4.40. Respondents were asked if, when they were growing up, their fathers had high or low expectations for them. Specific comparisons of the means for each managerial level resulted in a significant linear relationship at the .01 level of confidence and resulted in an F-ratio of 14.14. The findings indicated that top managers reported that their fathers had significantly higher expectations for the respondents than did the
TABLE XIII

SIGNIFICANCE OF F-RATIOS FOR TWELVE AREAS OF EARLY RELATIONSHIPS WITH THE FATHER

<table>
<thead>
<tr>
<th>Variable</th>
<th>Birth Order</th>
<th>Management Level</th>
<th>Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 (Expectations)</td>
<td>App.</td>
<td>*</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q2 (Decisions)</td>
<td>N.S.</td>
<td>N.S.</td>
<td>App.</td>
</tr>
<tr>
<td>Q3 (Love)</td>
<td>N.S.</td>
<td>**</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q4 (Affection)</td>
<td>N.S.</td>
<td>*</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q5 (Time)</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q6 (Democracy)</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q7 (Permissiveness)</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q8 (Discipline)</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q9 (Disappointment)</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q10 (Encouragement)</td>
<td>N.S.</td>
<td>App.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q11 (Acceptance)</td>
<td>App.</td>
<td>App.</td>
<td>*</td>
</tr>
<tr>
<td>Q12 (Similarity)</td>
<td>App.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

* Level of Significance = .05
** Level of Significance = .01
App. = Approaching Accepted Level, Level of Significance = .10
N.S. = Not Significant at the .05 or .10 Level of Confidence
fathers of middle managers. Likewise, middle managers indicate significantly higher paternal expectations than did first-line managers.

Analysis of variable Q3, concerning how frequently the respondent felt his father expressed love for the subject, resulted in an F-ratio of 4.73, which was significant at the .01 level of confidence for management level. The bi-polar choices were expressions of love stated frequently or never by the father. Specific comparison of management levels resulted in a significant quadratic effect at the .05 level of confidence with an F-ratio of 4.37. The finding indicated that middle managers reported expressions of paternal love significantly less frequently than either top or first-line managers. No differences were found when first-line managers were contrasted with top managers.

The analysis of adjective phrase Q4, reporting the frequency of expressed affection by the father toward the respondent, resulted in an F-ratio of 3.41. This value was significant at the .05 level of confidence for managerial level. Respondents were asked to choose between "showed affection often" or "never showed affection." Specific comparisons resulted in a significant linear effect with top managers reporting the highest level of expressed affection by the father. The F-ratio for this specific comparison was 4.56, which was significant at the .05 level of confidence.
Variable Q11, which measured a feeling of acceptance of the respondent by the father, showed a significance at the .05 level of confidence for the interaction between birth order and managerial level. The resulting F-ratio was 2.63. The alternatives were "accepted me" or "rejected me." Specific comparisons among ordinal positions within each management level indicated that the interaction effect was limited to first-line and middle managers. For first-line managers, later borns felt significantly more accepted than did only and first-born managers when the early borns were combined together as a class. The resulting F-ratio was 7.65, significant at the .05 level of confidence. Among middle managers, first-born managers recorded a significantly higher level of acceptance by the father when contrasted with only borns. This latter comparison resulted in an F-ratio of 4.30, significant at the .05 level of confidence.

In summary, none of the twelve bi-polar adjective scales was found to be significant for birth order alone. Hypothesis Eight was not supported in the case of respondents' reported early paternal relationships. Three areas, those concerning paternal expectations, expressed love, and expressed affection, were significant for managerial level. One interaction effect between birth order and management level was found. The birth-order effects in this instance were
limited to first-line and middle managers and were not in the predicted direction.

**Results of Reported Relationships with the Mother**

As noted in Table XIV, an analysis of the adjective phrases for birth-order effects did not produce significant results at the .05 level of confidence for any of the twelve variables. Only one item, Q10, was found significant at the .10 level of confidence for birth order. Significant findings, as in the case of relationships with the father, were limited to management level and the interaction between ordinal position and managerial level.

Variable Q1, concerning the perceived expectations of the mother toward the respondent, was significant at the .05 level of confidence for managerial level with an F-ratio of 4.11. Specific comparisons of responses by management level resulted in a significant linear effect. The resulting F-ratio of 22.01 was significant at the .01 level of confidence. The findings showed that top managers reported that their mothers had significantly higher expectations for the respondents than did the mothers of middle managers. Similarly, middle managers indicated significantly higher maternal expectations than did first-line managers.

The analysis of variable Q9, which dealt with perceived expressions of disappointment by the mother concerning the subject,
### TABLE XIV

**SIGNIFICANCE OF F-RATIOS FOR TWELVE AREAS OF EARLY RELATIONSHIPS WITH THE MOTHER**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Birth Order</th>
<th>Management Level</th>
<th>Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 (Expectations)</td>
<td>N.S.</td>
<td>*</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q2 (Decisions)</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q3 (Love)</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q4 (Affection)</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q5 (Time)</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q6 (Democracy)</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q7 (Permissiveness)</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q8 (Discipline)</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q9 (Disappointment)</td>
<td>N.S.</td>
<td>**</td>
<td>App.</td>
</tr>
<tr>
<td>Q10 (Encouragement)</td>
<td>App.</td>
<td>*</td>
<td>N.S.</td>
</tr>
<tr>
<td>Q11 (Acceptance)</td>
<td>N.S.</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Q12 (Similarity)</td>
<td>N.S.</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

* Level of Significance = .05
** Level of Significance = .01
App. = Approaching Accepted Level, Level of Significance = .10
N.S. = Not Significant at the .05 or .10 Level of Confidence
was found to be significant at the .01 level of confidence for managerial level with a resulting F-ratio of 4.85. The choices were "never expressed disappointment" or "constantly expressed disappointment." Examination of the means for this variable classified by managerial levels suggested that top managers reported less disappointment expressed by the mother concerning the subjects than did either middle or first-line managers.

Analysis of adjective phrase Q10, which reported the frequency of encouragement or criticism given the subject by the mother, resulted in an F-ratio of 4.60 for managerial level. This was significant at the .05 level of confidence. The bi-polar choices were between "always encouraged" or "always criticized" the respondent. Specific comparisons of management levels resulted in a significant linear effect with an F-ratio of 8.43, significant at the .01 level of confidence. The finding indicated that top managers perceived a higher level of encouragement from the mother than did middle managers. Middle managers, in turn, reported more frequent encouragement than first-line managers.

Variable Q11, measuring perceived acceptance of the respondent by the mother, was found to be significant at the .05 level of confidence for both managerial level and the interaction of management level and ordinal position. The resulting F-ratios were 3.21 and 3.13, respectively. Specific comparisons among ordinal
positions within the three levels of management indicated that the interaction effect was evident only for first-line managers. When combined as a class, only and first-borns reported less perceived acceptance by the mothers of the subjects as contrasted to the later-born first-line managers. This analysis resulted in an F-ratio of 8.20, which was significant at the .01 level of confidence. No significant differences were found between only and first-born managers for first-line positions.

Analysis of variable Q12, which attempted to measure to what degree the subjects felt their mothers were like or not at all like themselves, was found to be significant at the .05 level of confidence for managerial level as well as for the interaction between ordinal position and managerial level. The resulting F-ratios were 4.08 and 2.31, respectively. Specific comparisons among ordinal positions for each management level indicated that the interaction effect was limited to middle managers. Later-born middle managers responded that they were more like their mothers than did only and first borns when early borns were combined as a class. The F-ratio for this comparison was 3.96, significant at the .05 level of confidence. Specific comparison between only and first-born middle managers showed that first borns responded that they were more like their mother than only borns. The comparison between early borns resulted in an F-ratio of 10.28, significant at the .01 level of
confidence. Examinations of the means indicated that only-born middle managers were significantly different from both first borns and later borns. Only borns were less likely than any other ordinal position to respond that their mothers were like themselves.

In summary, none of the twelve bi-polar adjective scales was found to be significant for birth order alone. Hypothesis Eight was not supported in the case of respondents' reported early maternal relationships. Five areas, those concerning material expectations, disappointments, encouragement, acceptance, and similarity, were significant for managerial level. Two interaction effects between birth order and management level were found. The birth-order effects in these two instances were not in the predicted direction.

SUMMARY OF RESULTS

Hypothesis 1: First-born managers will be over-represented as compared to later borns in first-line, middle, and top management positions.

Results: The results indicated no support for the above hypothesis. First-born managers were not found to be over-represented in any of the three levels of management.

Hypothesis 2: Only-born managers will be over-represented as compared to later borns in first-line, middle, and top management positions.

Results: The findings only partially supported the above prediction. An over-representation of only-born top managers was confirmed. However, only-born
first-line managers were found to be under-represented. No birth-order effect was indicated for middle managers.

Hypothesis 3: The over-representation of first and only borns will be higher, the higher the level of management. That is, proportionally more first and only borns will be found in top management than in middle management positions. Likewise, proportionally more first and only borns will be found in middle management than in first-line management.

Results: The suggested tendency was not confirmed by the results. As noted above, the only classification of ordinal position found significant in the predicted direction was only-born top managers.

Hypothesis 4: First and only-born managers will have a lower mean age than later borns in each level of management.

Results: Hypothesis Four was not supported in the present study, and the null hypothesis was accepted. Mean age level for first and only-born managers was found not to be significantly different than later-born managers.

Hypothesis 5: First and only-born managers will have a higher mean number of years of total managerial experience than later borns in each level of management.

Results: Mean years of previous managerial experience was found to be independent of the ordinal positions of the subject managers. The null hypothesis of no significant differences by birth order was accepted for this variable.

Hypothesis 6: First and only-born managers will be over-represented in line management positions when compared to later borns in each level of management.

Results: The prediction of an over-representation in line management positions for early-born managers was not supported by the results in the present study. The null hypothesis of no significant differences was accepted.
Hypothesis 7: First and only-born managers will have completed a higher mean number of years of formal education than later borns in each level of management.

Results: The prediction of a higher mean level of formal education for early borns was partially supported by the results. Taken together as a class, only and first-born first-line managers reported a significantly higher mean level of formal education than did later borns. This relationship was not found in middle and top management positions.

Hypothesis 8: First and only-born managers will report a higher pattern of early parental relationships that reflect permissiveness, warmth, and higher expectations as contrasted with later borns.

Results: The predicted parental relationship pattern was not supported by the findings in the present study. Birth-order effects found in an interaction effect for three areas were not in the predicted direction. A number of phrases were found to be significant for managerial level.
CHAPTER IV

ANALYSES AND IMPLICATIONS OF RESULTS

In this chapter, the findings reported in the previous chapter are interpreted and discussed. First, the findings pertaining to the prediction of an over-representation of early-born managers are discussed. Secondly, the results of the biographical and career variables that were thought to be affected by birth order are examined. Thirdly, the analysis of the reported early parental relationships of the subject managers are discussed. Additionally, the possible implications of each of the findings for managerial policy and guidelines for suggested actions are explored.

Over-Representation of Early-Born Managers

In Chapter I, evidence from past research was presented that supported the position of an over-representation of first and only borns in traditional and psychological measures of achievement. The groups cited included categories such as scientists, professors, Rhodes Scholars, and eminent men. Analyses of the results of these previous research studies led to the hypotheses concerning
managerial achievement in the present study. Also reviewed in Chapter I were the possible reasons found in the literature for a higher incidence of early borns in high achievement situations. From this background, the present study was formulated to concentrate especially on family interaction patterns, a sociopsychological frame of reference for the study of birth-order effects. The primary emphasis in this regard concerned differential parental attitudes and relationships with children of varying ordinal positions.

The central concern of the present study was to seek answers to the question of whether there was a statistically significant difference in the probability of successful managerial achievement in the petro-chemical manufacturing industry between early borns and later borns. The first two hypotheses proposed that an over-representation of first and only-born managers as compared to later-born managers would be found in the three levels of management studied. The third hypothesis suggested this finding would become more evident and stronger as the level of management increased.

As reported in Chapter III, the above hypotheses tested by chi-square analyses were only partially supported. Only borns at the top management level were found to be significantly over-represented as compared to other birth-order positions. This was not the case for only borns in first-line or middle management positions.
Quite unexpectedly, only borns were found to be under-represented in first-line management positions. Only-born middle managers were neither under nor over-represented. No birth-order effect was found for any of the three managerial levels in any ordinal position other than only borns. Contrary to expectations, first-born managers were not found to be over-represented in any of the managerial levels.

The different findings in the present study concerning first and only-born managers suggest that recent statements in the literature calling for separate treatment of the two birth-order positions have validity. The present findings do indeed suggest that while similarities may exist in only and first borns, significant differences are also found.

**Similarities in Only and First Borns**

Previously cited studies and theories provide support for the finding of an over-representation of only-born top managers. As suggested by Altus, the most often mentioned reasons for observed differences in early borns found in the literature concern differential parental treatment, greater "conscience" development, a higher dependence on adult norms, and higher expectations by parents of

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achievement for early borns. It has been suggested that the greater "conscience" development mentioned above for early borns derives from the parents' setting more and better defined boundaries for acceptable behavior for first and only borns than later borns. Parents appear more likely to punish early borns than later borns for transgressions of these standards. Therefore, a higher degree of "conscience" development results in early borns. However, the reasons cited by Altus are generally assumed to exist for only borns as well as first borns. The question concerning the findings then becomes one of why differences were found in the only-born top manager but not in those first born.

Forer\(^2\) cites the many similarities in the development of only and first-born children. The parents of both usually more joyfully anticipate their arrival than the arrival of later children. Also, the first born is an only child until the arrival of siblings. The two ordinal positions are usually found to have a closer, more intense relationship, and a greater amount of attention from parents than those later born. Expectations of parents for only and first borns are generally found to be higher than for later borns. Both classifications also tend to adopt adult norms and utilize the parents as a direct model and source of identification more readily than later-born borns.

children. As a result of the above conditions, the two classes of early borns tend to consider themselves as rather important individuals. Sutton-Smith and Rosenberg,\(^3\) summarizing a number of studies concerning relationships between early borns and parents, state that "... apparently both parents and firstborn are more concerned with each other than are parents and non-firstborn."

This concern, according to these authors, was evidenced by higher expectations by the parents, higher performances by the children, a "special" relationship between the child and parents, and a higher degree of "conscience" development in early borns. That these assumptions about the similarities of development of both only and first borns have been widely accepted can be verified in the rather large number of studies that consider only and first borns together as one class.

The assumptions discussed about the early developmental patterns of both classes of early borns tend to suggest resulting positive attitudes toward work and responsibility that would be conducive to managerial achievement. The early achievement demands by parents are at some point possibly internalized by the early-born adult as high achievement standards for himself. The first born learns to work under situations of more extreme expectations. A

strong "conscience" development is also possibly internalized, and
the early-born adult attempts to act in ways that conform to "what
should be done." In summary, the early-born adult considers him-
self as a rather important individual that is both capable and expected
to do well. He has succeeded in the past in various ways and expects
to perform equally well in the future.

One word of caution appears necessary at this point. The
above discussion about the similarities in the development of all
early-born children and the one to follow concerning differences in
only and first borns are only presented very tentatively. In the
present study we do not know and can never know for certain the
actual developmental patterns as well as the large number of other
influences unrelated to birth-order that may affect later behavior in
the subjects. This presentation only attempts to generalize findings
in the literature as they might apply or relate to the present study.

Differences in Only and First Borns

As mentioned, some explanation of the possible differences
in the development and later behavior of only children as contrasted
with those who are first born appears necessary in the present study
because of the varying results found concerning only and first-born
managers. Only-born top managers were found to be statistically
over-represented. This was not the case for first-born managers of any managerial level.

As previously stated, both only and first borns appear to have a closer relationship with their parents than later children. However, as Forer⁴ has concluded, "Unlike the oldest child, the only child continues throughout childhood and adolescence to have the same close and undivided attention and control by his parents." Since additional siblings do not enter into the home, as is the case for first borns, parental attention and pressure may be placed solely on the only child as long as he lives in the home of his parents. In other words, "the only child . . . tends to remain the target for the demands, expectations, and the discipline of both parents."⁵ With this full and continuing attention of his parents, he never has to face the disappointment of younger brothers or sisters arriving to take his place. The only child never is confronted with the situation of competing with other siblings for the attention and affection of the parents. Possibly for these or some other reasons not fully understood, the only child has generally been found to be more self-confident and relaxed than first borns.⁶ It would appear that

⁴Forer, Birth Order and Life Roles, p. 68.
⁵Ibid.
⁶Ibid, p. 70.
self-confidence in one's own abilities would be very helpful for effective managerial achievement.

Although there may be disadvantages to receiving the full brunt of parental attention, some advantages also exist for those who are only borns. One such advantage is an economic one. Without other children in the family competing for financial resources, the only child is likely to be at an advantage in securing funds for advanced educational training as well as for opportunities for social and cultural experiences. Parents may be financially more able to provide only borns with opportunities for a wide range of activities such as music lessons, social clubs, and attendance at summer camp. Secondly, if both classes of early borns perceive themselves as important and unique individuals because of early parental attention, the feeling in this regard for the only child may be stronger or different because no other children arrive on the scene to change matters. Also, since only children are generally more often alone than children with siblings, "... the only child tends to enjoy having the time and opportunity for quiet thinking." Another writer has suggested that because he has been alone more often in childhood than have those in other ordinal positions, the only child may develop

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7Ibid., p. 79.

8Ibid., p. 83.
more independence, more self-reliance, and more courage. The ability to face situations alone in a self-reliant manner may become increasingly important in top managerial levels. At the top, there may be no superior to turn to for advice. Lastly, only borns, because of their constant interaction with parents, may tend to view the world relatively more quickly and consistently from the viewpoint of the adult or parent. He may tend to act in "parental" ways. "He may be quick to think of ways to help other people and be ready with suggestions as to how crises and problems may be met."^10

These opportunities for additional educational, social, and cultural advantages, the full and continuing attention of the parents, a lack of competition with other siblings, enjoyment in being alone, and a possible higher level of self-confidence may suggest possible reasons for the differences found in the present study concerning only and first borns. It is relatively easy to see how many of the above factors or tendencies may assist an individual in achievement situations. Self-confidence, the ability to provide structure in various situations, enjoyment of quiet thinking for problem resolutions, additional experiences, independence, and self-reliance would be helpful in most managerial positions. It is possible that the

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10 Forer, Birth Order and Life Roles, p. 68.
differences in only and first borns in these variables may only be one of degree, but significant enough to be reflected in the findings.

**Variations in the Findings for Only-Born Managers**

The findings relating to only-born first-line and middle managers are not consistent with the previous discussions concerning early borns. Only-born first-line managers were found to be statistically under-represented in the present study while the only-born middle managers showed no tendencies in any direction. As was reported in Chapter III, only-born managers progress in a linear relationship from an under-representation in the first-line positions, to no observed differences in middle management, and finally to an over-representation in top management positions. This means that of the total only-born managers for all positions, the over-representation in top management is significant even though a less than expected number hold first-line management positions, and no variations from chance are found in middle management. This would appear to make the finding of the significant over-representation found in top management more impressive. Starting out with less only borns than expected in the first-line positions, the representation becomes as statistically expected in middle management and over-represented as predicted in top management.
One reason for the under-representation in only-born first-line managers reported in the present study may be the varying levels of formal education of the respondents in this category. As noted in Table X in Chapter III, and to be discussed in more detail later in this chapter, only-born first-line managers have a mean level of 15.3 years of formal education as opposed to 13.8 years for first borns and 12.9 years for later borns. The level of formal education for only borns was found to be significantly higher than for the other ordinal positions. In the petro-chemical manufacturing industry, many, if not the majority of, first-line positions do not generally require a college degree. As noted in Table I in Chapter II, the average educational level for all first-line managers in the present study was found to be 13.3 years, representing somewhat over a year of college. The only-born first-line manager in the present study, with a mean level of formal education of 15.3 years, almost four years of college, may be more likely to go initially into staff positions or to a level of management higher than that of the first line. This does not answer why the level of education is significantly higher for only-born subjects in the lowest level of management. It does, however, provide a possible reason for the under-representation found.

The lack of significant findings in either direction for only-born middle managers is puzzling. Perhaps it is just a reflection of
the under-representation found in only-born first-line managers. That is, by the middle management level, the only borns have caught up in the expected proportion of total managers. This progression appears to continue, with the significant over-representation appearing at the highest managerial level. On the other hand, the only born may tend to be hired at the middle management level or progress to it from a staff position as mentioned earlier. It is common in the industry studied to hire degreed engineers in staff positions for a few years of experience and training before management opportunities are available. When these managerial opportunities become available, they may tend to be above the first-line level. In whatever method the process takes place, it is evident for the present findings that in some manner the only-born middle managers tend more readily to advance to top managerial posts than do other ordinal positions.

Implications for Management

Any generalizations and resulting implications for management concerning the findings in the present study are limited in several ways, as outlined in Chapter I. Male managers working in the petro-chemical manufacturing industry were the subjects utilized in the study. In addition, for first-line and middle management, responses were limited to two geographical areas. The two areas
are major centers of petro-chemical production, and they do represent a significant proportion of the industry. Because of these descriptive factors, generalizations about the first two levels of management are limited, and little can be said concerning female managers.

What do the results in the present study mean to management?

The major finding in the predicted direction concerns only-born top managers. Based on the analysis of the data, only-born top managers in the industry are statistically over-represented. That is, more only borns are found in top management positions than would be expected by chance. It appears, then, that the only born has a proportionally better chance of reaching top management than any other birth order. It could be said, then, that the only born appears to be high in achievement motivation as he is found at the top more often than expected. Since effective high-level management is critical to the profitability and survival of business organizations, this would seem to be an important finding. By utilizing this knowledge, a firm may be able to more effectively locate and utilize potential top managerial candidates.

Through determination of ordinal position and in conjunction with other background data, the achievement potential of each individual worker can be discovered, and management can make work assignments consistent with the amount of drive possessed by the
individual. If high achievement potential in a worker is discovered, the managerial treatment he receives can capitalize on his self-motivations. Since it is expected that he will respond to developmental opportunities readily, he can be purposefully groomed for these opportunities and guided toward them.

Job design and position requirements should appeal to high achievers more effectively when a visible opportunity for meaningful achievement is provided. High achievers would appear ill-suited for job conditions requiring endurance without tangible gain. Since a feeling of accomplishment reinforces achievement needs, the high achiever should be most responsive to regular positive feedback concerning his performance. The above suggestions for managerial action particularly may be of assistance in more effectively utilizing the knowledge gained from the present study concerning only borns.

In regard to the finding indicating an under-representation of only-born first-line managers, the evidence does not readily suggest implications that management may act upon. The manager may note, however, that the only born will less likely hold a first-line position than other birth orders. The implications for only-born middle managers would appear to be important because some members of middle management will eventually be promoted to top managerial positions. Even though the proportion of only borns at this level is as statistically expected, it appears that more managers
of this ordinal position reach top managerial posts. As previously mentioned, this knowledge may be useful in the selection and training functions.

For first borns, the findings were not significant in the predicted direction and indicated no discernible birth-order effects in any level of management. In other words, the fact that a person is a first born appears not to affect the probability of managerial achievement in the petro-chemical manufacturing industry. The reason for this negative finding may be the differences found in only children as compared to first borns as discussed earlier. Perhaps some other factors are responsible for this finding. This information does tell the manager that he may be in error if he thinks of only borns and first borns as identical. At least in the petro-chemical manufacturing industry, the results in the present study point to significant differences between the two types of early borns.

Dubno, et al., in the only previous ordinal position study using managers as subjects, found an over-representation of first borns in middle management, but not in top management. Their data included a combination of many industries. This grouping together of several types of industries may have been responsible for the varying findings. It does appear significant, however, that

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in both the more general study by Dubno, et al., and the present study limited to one industry, first borns were not found to be over-represented in top management.

The managerial implications and suggestions for actions outlined above are presented only as tentative suggestions. Other studies of practicing managers are needed to support or modify the tendencies found in the present study. The results may vary from industry to industry or because of other differences. Also, inclusion of other variables such as the subject's socio-economic background and specific managerial function may result in some clarification concerning the relationship between birth order and managerial achievement. It is also important to remember that many other factors in addition to a person's ordinal position may affect behavior. As Dubno\textsuperscript{12} has pointed out, birth order is "... a necessary but not sufficient cause ..." for explaining human behavior.

Birth-Order Influences Concerning Biographical and Career Variables

In this section, the biographical and career variables thought to be influenced by birth order are discussed. Age levels of the subject managers are discussed. Secondly, the number of years of managerial experience of respondents are explored. Next, line and staff management positions are analyzed. Finally, the level

\textsuperscript{12}Ibid., p. 278.
of formal education of the subjects is discussed. Each of the find-
ings analyzed in this section is examined in relation to possible
implications for management.

Age Levels

One biographical variable that was predicted to be associated
with ordinal position was the mean age of the subject managers.
Hypothesis Four suggested that first and only-born managers would
have a lower mean age than later borns in each level of management.
This position was taken because it was felt that if early borns proved
to be higher achievers, it could then be expected that managers of
those ordinal positions would reach their management posts in a
shorter time period than those later born. On this basis, early-
born managers would be younger, on the average, than later borns.

As reported in Chapter III, this hypothesis was not supported
at the .05 level of confidence, although the overall analysis was
found to be significant at the .10 level. A visual examination of
Table V in that chapter does suggest some differences, however.
While not statistically significant at the normally accepted level,
only-born first-line managers reported a mean age level of 40.5
years, which was 4.6 years younger than first borns and 6.4 years
younger than later-born first-line managers. Only slight differences
were found in mean age levels in the other managerial levels. These
relatively large observed differences in mean ages of first-line managers in differing ordinal positions appear in the predicted direction for only borns. Perhaps a larger sample in a future study might show significant differences. This particular tendency in only-born first-line managers is interesting in light of the findings previously mentioned that this same group was also found to be significantly higher educated than other birth-order positions.

However, since the results were not at the acceptable level of significance, little in the way of generalizations can be attempted. Also, no like tendencies were found in either middle or top management, and even first-born lower level managers did not indicate the trends suggested in only borns. What must be accepted based on the findings is that the age variable in the present study was not affected by the birth positions of the respondents. Because of these negative results, no specific managerial actions can be suggested concerning this variable.

Apparently the researcher made erroneous assumptions concerning this variable, or the predicted effect, while present, was not strong enough to show up as significant, or some other unrecognized forces influenced the results. It does appear, however, that at least in first-line management additional studies might be helpful either in confirming the negative results of this study or to assist in casting new light on this area.
Years of Managerial Experience

Related to the above discussion concerning mean ages of the subject managers, Hypothesis Five predicted that first and only-born managers would report a higher mean level of years of total managerial experience than later borns for each level of management studied. It was felt that if early borns reach their first management position at a younger age, this would result in a significantly higher mean number of years of total managerial experience for first and only borns as contrasted with later-born managers.

As in the case of mean ages, this prediction was not supported by the findings. Results of the analysis of variance calculated were negative. Mean years of previous management experience showed no relationship to the ordinal positions of the respondents.

The only relatively large differences apparent in an examination of the means, as found in Table VII of Chapter III, are those of early-born top managers. Top managers who were only born had a mean level of total managerial experience 5.1 years higher than first-born top managers. An overall lack of significance precluded testing for differences of these two classes separately, however. Positive results of such an analysis would not support the hypotheses of the present study. It might, however, support some of the earlier discussion indicating that while only and first borns are similar in many respects, significant differences also exist.
The reasons for the negative finding concerning experience are as difficult to predict as was the lack of results for the age levels of the respondents. Perhaps the variables of age and experience are related. It could be expected that if the age variable was not shown to be as predicted, the suggested tendencies in the managerial experience levels would also not be present. The hypothesis concerning the total number of years of managerial experience was based on first finding age differences. Because of the lack of significant findings, the only apparent implication for management in the present study is that birth order and the total number of years of managerial experience are not related.

Functional Areas of Employment

Hypothesis Six predicted an over-representation of first and only borns in line management positions when compared to later borns in each of the three levels of management studied. This tendency was suggested because it was felt that first and only-born managers would prove to be higher achievers than later borns. As discussed earlier in this chapter, however, high achievement for early borns was only partially supported. High achievers have been found to desire more accountability and concrete feedback concerning
their performance than low achievers. As discussed in Chapter I, it seems logical to assume that line positions, as defined in this study, more readily offered a manager opportunities for accountability and feedback about performance on the job. Line managers were defined as those managers working in the areas of departments of production, operations, sales, or equivalent departments. Managers working in areas other than the above, such as accounting or technical services, were classified as staff managers. Managers holding line positions generally are charged with the responsibility, authority, and accountability of accomplishing the organization's primary objectives. These characteristics appear to be inherent less often in staff managerial posts, which tend to be more advisory in nature.

As reported in Chapter III, the chi-square analysis calculated to test the above hypothesis fell far short of significance. Neither only nor first-born managers were found to be over-represented in line positions when compared with later borns. The prediction was not supported at any level of management.

Based on the results, no significant relationship between the functional areas of a manager's job and ordinal position were found.

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Some of the assumptions made that lead to the present hypothesis were not supported. The assumption that all levels of early borns would be high achievers proved to be true only for only-born top managers. One reason for the negative findings may also be that both line and staff positions offer substantially the same types of environments and rewards for the managers. High achievers may be equally satisfied in either type of position. Another possibility is that individuals in certain fields of academic specialization may tend to end up in certain functional areas, across all ordinal positions. An example of this would be the individual who majored in accounting in college. This person would in most cases tend to work in what is generally considered a staff area, the accounting function.

On another level, the classification system employed by the researcher may be questioned concerning its accuracy. The classifications assigned were made as rather general approximations based on the information provided by the subject managers. Additional or different types of information about the subject's duties may have been necessary to more effectively classify the respondents as either line or staff managers.

More important may be the question of whether the two-category system utilized in the present study reflected the various managerial areas as they actually existed. In other words, is it
useful and realistic to attempt to classify managers as either line or staff? Many management textbooks consider the problems and confusion found in efforts to classify managers in this manner. Also, Megginson\textsuperscript{14} cites the rise of the role of specialists in business organization and the increasing use of functional authority, which does not fit neatly into the classification system used in the present study. Perhaps other like variations were present in the current study. This would lead one to suspect that classifying subjects as either a line manager or a staff manager may not be simple or even the most appropriate or meaningful classification system.

This apparent lack of clear and distinct differences between staff and line positions appears to be a possible cause for the negative findings. Future researchers may find it necessary to utilize other methods for determining functional areas of management that more nearly describe the management positions as they actually exist. The variations and differences may be so numerous, however, that this may not be possible. Whatever the reasons for the negative findings, the only conclusion that can be reached in the present study concerning the petro-chemical manufacturing industry is that the functional areas of employment of the subjects classified as either

line or staff positions were not affected by the birth order of the respondents.

**Formal Education Levels**

Based on the evidence of past research presented in Chapter I that indicated a higher rate of college attendance among early borns, a prediction concerning the formal education levels of the subject managers was formulated. Hypothesis Seven predicted that early-born managers would show a higher mean number of years of formal education than later borns in each level of management. Further, since many business organizations are increasingly requiring college training for management positions, and because colleges and universities have been found to be a major source of potential managerial personnel for many firms, testing of the above hypothesis would indicate if the over-representation of early-born college students in general is also reflected in the managerial ranks of the petro-chemical manufacturing industry.

As reported in Chapter III, the above prediction was only partially supported. Since the calculation of the analysis of variance indicated an interaction effect between managerial levels and birth order, specific comparisons of the educational levels by birth order at each managerial level were performed.
As noted in Table XII of Chapter III, only and first-born first-line managers, taken together as a class, reported a significantly higher mean level of formal education than did later borns. Additionally, only-born first-line managers had a significantly higher educational level than that reported by first borns. Both analyses were significant at the .01 level of confidence. In summary, Hypothesis Seven, which predicted a higher mean level of formal education for early borns, was supported for first-line managers. The interesting and unexpected finding in this lowest level of management was the fact that only borns were also found to have a significantly higher educational level than first borns. The first born's educational level was found to be much closer to that of later borns than only-born managers. This latter finding adds additional support to the contention made earlier that significant differences exist between the two types of early borns. This was found to be the case in the present study for first-line managers when the level of formal education was measured.

The findings for middle managers differed from those found in first-line management. No significant differences were observed. The mean levels of formal education for middle managers varied only one-tenth of a year between ordinal positions. In summary, the predicted relationship concerning education and birth order was not supported in the case of middle managers.
The results of top managers are even more confusing. While no differences were observed when only and first-born top managers combined together were contrasted with later borns, a significant difference at the .05 level of confidence was found between only and first borns. Opposite to the results for first-line managers, first-born top managers indicated a significantly higher educational level than only borns.

The varying results for each level of management are difficult to interpret. It is not clear why the predictions concerning the educational variable were supported for first-line managers, but not for middle or top managers. Perhaps the level of formal education for early borns is important in only the lowest level of management. It would seem reasonable to assume that as a firm has an opportunity to observe an employee's performance on the job, the educational level becomes less important and actual job performance more important in future assignments and promotions. A changing situation such as this may account for the lack of differences found in the educational level between early borns and later borns in middle and top management. Most managers in the two higher levels of management are well educated in terms of formal education, and relatively little difference in education is found. Once in the managerial ranks, performance, not years of formal training, becomes the critical factor. The edge in educational level for early borns would appear
to enhance the possibility of obtaining a position originally, however.

The above line of thinking is not in complete agreement with an earlier finding. Only borns were found to be under-represented in first-line management. Also, first-born first-line managers were found to be neither over nor under-represented. Based on the educational levels found in only-born first-line managers, it could be assumed that an over-representation would be found at this level. One possible reason given for the unexpected under-representation concerning only-born first-line managers was the possibility that only borns may be too highly educated for first-line positions. That is, the education level of only borns may just increase the possibility of being originally hired or transferred to middle management rather than first-line management.

It appears then that only borns, first borns, and later borns each differ in some respects in the amount of formal education at the first level of management. The effect these differences have on possible managerial achievement in the petro-chemical manufacturing industry is not entirely clear. What is clear is that educational differences between early and later borns tends to decrease as the level of management increases. No observed differences in early borns as compared to later borns were found in either middle or top managers.
The meaning of the finding of a significantly higher level of education for first-born top managers as contrasted with only borns is not readily explainable. The strength of the significance was not as strong as that found in the early-born first-line managers, and the difference in mean years of formal education amounted to only one year. Perhaps this finding just reinforces the over-representation found in only-born top managers. Despite an educational disadvantage relative to first borns, only-born top managers were found to be over-represented when no like relationship was noted for first borns. Even though first borns are better educated than only borns at this level, only borns were found in top management more often than expected. This was not the case for first borns.

In summary, the prediction of higher levels of formal education for early-born managers was supported only for first-line management. No like findings were recorded for middle or top management. Managerial applications of the education variable as affected by birth order are limited to the lowest level of management in the present study. Early-born managers will tend to be more highly educated than other ordinal positions in first-line management. Perhaps more important, the differences found in the educational level of early borns in first-line and top management suggest once again that only and first borns are significantly different in some respects.
Reported Early Relationships
With Parents

This section contains the analysis and discussion of the results obtained from the administration of the bi-polar adjective phrase scales concerning early relationships of the respondents with their parents. This very exploratory part of the present study attempted to determine if the subject managers' ordinal positions affected their early relationships with parents. Relationships with both the mother and father were treated separately. As mentioned in Chapter III, the twelve phrases were numbered from Q1 to Q12 for each parent for discussion purposes.

As previously reported in Chapter I and earlier parts of this chapter reviewing the predicted over-representation, the findings of previous research, although unclear and at times conflicting, were presented to support the hypothesis that first and only-born managers would report a higher pattern of early parental relationships that reflected permissiveness, warmth, and higher expectations as contrasted with later borns. To test this prediction, a two-way analysis of variance by managerial level and birth order was conducted for each of the twelve phrases for both the father and the mother. The results failed to support the hypothesis as not one of the twelve bi-polar adjective phrases for either the father or mother was found to be significant for birth order alone. For both parents,
significant findings were limited to the managerial level and the interaction between ordinal position and managerial level. No specific predictions were made concerning management level and early relationships with the parents.

A Review of Findings Concerning the Father

Only one phrase concerning the father, Q11, which concerned perceived acceptance by the father, resulted in a significant interaction effect between birth order and managerial level. This finding was limited to first-line and middle managers and was not in the predicted direction. In first-line managers, later borns felt more accepted by the father than did only and first borns. Also, first-born middle managers reported a higher feeling of acceptance as compared to only borns. Clearly, the hypothesis that suggested permissiveness, warmth, and higher expectations by the father toward early borns was not supported.

Although no specific hypotheses were formulated concerning early interactions with the father and managerial level, the findings do appear relative to the present study. Top managers across all birth orders reported similar findings in two areas, those concerning expectations and affection, variables Q1 and Q4. Top managers reported a perceived higher level of expectations by the father than did middle managers. Likewise, middle managers reported higher
expectations than first-line managers. Also, top managers reported that their fathers showed affection more often than did either middle or first-line managers. A third significant finding, concerning variable Q3, indicated that middle management subjects reported that their fathers more frequently told the respondents that they were loved than did first-line managers.

A Review of Findings Concerning the Mother

Two adjective phrases, Q11 and Q12, concerning perceived acceptance by and similarity between the respondents and their mothers, were found to be significant for an interaction effect between birth order and managerial level. Neither was in the predicted direction, however. Later-born first-line managers reported a significantly higher feeling of acceptance by the mother than did first and only borns. Later-born middle managers responded that their mothers were more like themselves than did only or first borns. Only-born middle managers felt less than any other ordinal position that their mothers were like themselves. As in the case of reported relationships with the father, the hypothesis predicting permissiveness, warmth, and higher expectations by the mother for early borns was not supported.

Three significant findings were found for managerial level across all birth orders. Two findings, concerning variables Q1 and
Q10, showed a similar pattern. Top managers reported their mothers both had higher expectations and encouraged them more often than middle managers. Similarly, middle managers showed the same trends of higher expectations and more frequent encouragement when contrasted with first-line managers. Also, top managers responded that their mothers expressed disappointment in them less often than did either middle or first-line managers.

Conclusions and Implications of Reported Early Parental Relationships

The lack of significant findings in the predicted directions are evident from the results concerning the bi-polar adjective scales. These unexpected findings were disappointing and confusing. The majority of what has been written about birth-order effects is based on the assumption of differential treatment by parents of children of varying ordinal positions. Discussions in Chapter I and the first part of the present chapter reviewed many of the presumed causes and implications of this differential treatment. Additionally, the results of the present study concerning early parental relationships did not support the earlier mentioned finding of an over-representation of only-born top managers in the petro-chemical manufacturing industry. The three significant interaction effects found between birth order and management level were not in the predicted direction. However, the differences found in only and first borns in this regard
did support previously discussed differences between the two classes of early borns.

There are several possible reasons why the predicted relationships were not found in the present study. Respondent managers were asked to report on relationships with their parents when the subjects were growing up. The average ages of the respondents combining all birth orders were found to be 45.6 years for first-line managers, 44.4 years for middle managers, and 52.6 years for top managers, as shown in Table I of Chapter II. Clearly, the subjects were asked to give their perceptions of events that took place years ago. It is very likely that with the intervening years the accuracy of the responses was affected. Did the subjects report the actual relationships or ones colored by passing years and possible bias reflecting desires of what they wanted the relationships to be like? Is it even reasonable to expect unbiased answers considering the above situation? Therefore, the ages of the respondents and the time lag inherent in the collection of the data suggest possible problem areas.

Other important factors in the negative findings may be the large number of other variables not controlled in the present study that affect later behavior in addition to ordinal position. Factors such as death of a parent, age and sex differences of siblings, socio-economic background of the family, inherited characteristics,
past education and experiences, and other variables in a person's environment may have negated possible birth-order effects.

Another alternative factor responsible for the negative findings may be the nature of the questions asked. Inquiries about early relationships with parents are by their nature personal questions, and the respondents may have been hesitant to answer accurately even though the questionnaires were administered in such a manner that anonymity was protected. It was not possible to measure any tendencies in this direction in the present study. Therefore, it is not known if the personal nature of the questions affected the results in the present study.

The scales themselves may have affected the responses. As constructed, the instrument may not actually have measured early parental relationships, but something else. In this very exploratory section of the present study, lack of previous experience with the scales except for the pre-test and a lack of validation may have influenced the findings.

Perhaps a more important factor affecting the results is the effect parents have been shown to have on all their children, regardless of ordinal position. As stated by Forer:  

> Parents transmit to us the basic characteristics of our personalities. We learn to be orderly, messy, optimistic or gloomy, irritable or calm,

---

from identification with them and from the general atmosphere they establish in the homes. If they have helped us to be kind, gentle, affectionate, that is generally how we will be in any place in the family...

The composition of the family, the atmosphere of the family, and efforts made by the parents can all change the impact of the sibling role on the development of the child.

The relative importance of the parents on all birth orders may be reflected in the example of families where several of the members are eminent or outstanding or alike in some other respects.

This discussion concerning the overall importance of the parents on the development of individuals of all ordinal positions is interesting in light of the significant findings reported in managerial levels across all birth orders. For reported relationships with both the father and mother, the higher the level of management, the higher were the perceived expectations of the parents for the respondent. This finding appears very significant as it reflects a Pygmalion effect, as if somehow the expectations of the parents were fulfilled. Although the other findings for managerial level did not overlap for both parents, at least the findings concerning the mother tend to support those found for expectations. The higher the level of management, the more mothers were reported to have encouraged the respondents and less often expressed disappointment in their performance. The responses concerning the father indicated that
the higher the level of management, the more the fathers showed affection for, and told the respondents they loved them.

A pattern emerges for the early parental relationships of the higher level managers where both parents held high expectations for the subjects. The mothers also encouraged the respondents more often and were less likely to express disappointment in them. The fathers also showed affection and expressed love for the subjects more often.

In summary, Hypothesis Eight was not supported for either parent. A pattern of permissiveness, warmth, and higher expectations concerning early borns was not found. The three interaction effects concerning birth order by managerial level were not in the predicted direction. The only conclusion that can be reached based on the results is that the reported early parental relationships were found to be generally unrelated to ordinal position in the present study of managers in the petro-chemical manufacturing industry. Several possible reasons were suggested for the negative findings. Therefore, no suggestions concerning these findings and possible managerial actions are outlined.

The incidental findings concerning the bi-polar phrase scales and management level across all birth orders appear to be more promising for suggesting managerial implications. Patterns of early childhood development were suggested for higher level
petro-chemical managers, especially those in top management. This information could be useful when combined with other data in attempts for more effective selection, training, promotion, and like functions. Industry could make attempts to obtain early parental relationship data from employees and applicants to more effectively locate potential high achievers.

SUMMARY

In this chapter, findings presented in Chapter III were discussed. Results concerning each of the hypotheses formulated were analyzed relative to possible conclusions and implications for managerial policy and actions. Also, negative findings were explored in an effort to determine possible reasons for the lack of relationships found in the present study. The limitations of generalizations made concerning the findings were also reviewed.

Discussions included the major finding and implications of an over-representation of only-born top managers in the petro-chemical manufacturing industry. The results did not support an over-representation of first borns in any managerial level. Additionally, the data for variables thought to be affected by birth order were examined. These included ages, years of managerial experience, functional areas of employment, and educational levels of the respondent managers. Lastly, the results obtained from the
administration of the bi-polar adjective phrase scales that attempted to determine early relationships of the subjects with their parents were explored.

In the next and last chapter of the present study, a summary of the entire research project is presented. Recommendations for future research are also presented.
CHAPTER V

SUMMARY AND SUGGESTIONS FOR FUTURE RESEARCH

The central concern of the present empirically-based study was to seek answers to the question of whether there was a statistically significant difference in the probability of successful managerial achievement in the petro-chemical manufacturing industry between early-born and later-born managers. In addition, the biographical and career variables of age, years of managerial experience, functional areas of employment, formal education levels, and early parental relationships of the respondents were analyzed for possible birth-order effects.

Of the 440 male subject managers included in the project, 181 were classified as first-line managers, 156 as middle managers, and 103 were in top management. First-line and middle management respondents were utilized from eight participating petro-chemical manufacturing plants in the Baton Rouge, Louisiana, and Houston, Texas, areas. Top managerial subjects, those with a position of vice president or higher, were obtained from the forty
largest chemical and petroleum manufacturing firms and were drawn from throughout the country.

Several hypotheses were formulated based on past research findings that supported the position of an over-representation of first and only borns in both traditional and psychological measures of achievement. Previously studied groups that indicated an over-representation of early borns included astronauts, scientists, university professors, American men of letters, eminent men, and Who's Who listings. Most differences found in the study of individuals of various ordinal positions have been explained in the past based on the assumption of differential treatment by parents of children of varying birth orders. The present study also utilized the sociopsychological frame of reference concerning family interaction patterns.

Hypotheses, Results, and Implications for Management

The present chapter provides a summary of the proposed hypotheses, the results obtained, and the resulting implications for managerial action. Also included in this chapter are suggestions for future research in the area of birth order and managerial achievement.
Over-Representation of Early-Born Managers

Hypotheses One and Two predicted that an over-representation of first-born and only-born managers as compared to later borns would be found in first-line, middle, and top management of the petro-chemical manufacturing industry. The third hypothesis proposed that this over-representation would become more evident and stronger as the level of management increased. The three above proposals were the major concern of the present research project.

Only-born top managers were found to be significantly over-represented when compared to other ordinal positions in the chi-square analyses calculated. Only-born first-line managers were under-represented. The results only partially supported the first three hypotheses that proposed an over-representation for both first-born and only-born managers in each of the three levels of management studied. This position was confirmed for only-born top managers but not for first-born managers at any level of management. No predicted birth-order effect was found in any other ordinal position than only borns.

The lack of significant findings in the predicted direction for first-born managers was unexpected. One possibility for the negative results for first-born managerial respondents centers on the differences in developmental patterns in only borns and first borns.
While many similarities appear to exist in the development and relationships with parents in the two classes of early borns, significant differences also seem to be present. The finding concerning the under-representation of only-born first-line managers may have resulted from this group's higher educational level relative to other ordinal positions. Only-born first-line managers were found to have a significantly higher formal educational level than either the first-born or later-born classifications. It was proposed that this higher educational level resulted in the only-born first-line manager being more readily assigned to a staff position or a managerial position above that of the first-line rank.

The above findings suggest that the only born has a proportionally better chance of reaching top management in the petrochemical manufacturing industry than any other birth order. This could be interpreted to mean that the only-born manager appears to be higher in achievement motivation than other birth orders as he is found more often at the top than expected. This information could be useful to management in identifying applicants and employees with potentially high achievement motivation, job design, training, development, and promotional considerations. Another significant implication for management is that first-born and only-born managers differ significantly in some respects. The manager who tends to think of the characteristics of first and only-born managers
as identical in nature, as is sometimes suggested in the literature, seems to have taken a not completely accurate position.

The findings and implications concerning the over-representation of only-born top managers and other results to follow were presented only tentatively. Because male managerial subjects were used, little can be said about tendencies in female managers. In addition, the findings concerning first-line and middle managers were limited to two geographical areas. Generalizations are, therefore, restricted concerning other geographical areas. Lastly, the study included only the petro-chemical industry. Results may be found to differ in other industries.

Age Levels and Birth-Order Influences

Another variable considered in the present study was the mean age levels of the subject managers. If first and only-born managers were thought to be over-represented in management and thus could be considered higher achievers than later borns, it was expected that the mean age of managers in each level of management would be lower for early borns. This prediction was based on the assumption that early borns, because of a higher drive for achievement, would obtain their managerial positions in a shorter time than later-born managers. Therefore, early borns would be younger. Based on the above reasoning, Hypothesis Four proposed that first
and only-born managers would report a lower mean age than later borns in each of the three management levels studied.

The two-way analysis of variance calculated to test the above hypothesis was not found to be significant at the .05 level of confidence, although it was significant at the .10 level. Because the results were not at the acceptable level of significance, no specific comparisons were made by managerial level.

An examination of the mean age levels does, however, suggest some differences in first-line management. The only-born first-line managers appeared to be younger than either first-born or later-born first-line managers. A positive finding confirming this tendency would be in the predicted direction for only borns. Perhaps a larger sample would have resulted in significance at the .05 level. Such a finding would support the previously mentioned differences found in first and only borns. Only minor differences in age levels were found in middle and top management for all ordinal positions.

However, based on the findings, what must be accepted is that the age levels of the managers in the present study were not affected by birth position. Perhaps the hypothesis was based on erroneous assumptions. A finding of significance at the .10 level of confidence and an examination of the mean age levels suggest that while the proposed relationship of a lower mean age for early
borns may exist, at least in first-line management, it was not strong enough to show up in the overall analysis. Because of the negative results, no generalizations for managerial action were made concerning the age variable.

**Birth Position and Years of Managerial Experience**

Based on the proposed finding of a lower mean age level for early borns as discussed above, Hypothesis Five predicted that first and only-born managers would have a higher mean number of years of total managerial experience than later borns in each level of management studied. This predicted relationship was based on the assumption that if early borns reach their management positions at a younger age than later borns, the results should suggest a significantly higher mean number of years of total managerial experience for early borns.

The results of the two-way analysis of variance conducted to test Hypothesis Five were negative. Ordinal position and mean years of previous management experience were found to be unrelated.

Since the prediction concerning years of managerial experience was based on the proposed finding of a lower mean age for early-born managers and no relationships were evident in age levels, it could be expected that a negative finding would result for Hypothesis Five. It would appear that the age and experience variables
may be related. The only relatively large differences found in an examination of the mean levels of years of management experience are those between first and only-born top managers. No major variations were evident between early borns and later borns at any level of management. A significant finding between the two classes of early borns would only have supported distinctions in first and only borns as previously mentioned, but would not have supported the proposal of more years of management experience for early borns made in the present study. Because of the lack of significant findings in this area, no implications for management were presented.

**Birth-Order Effects on Functional Areas of Employment**

Because it was felt that early borns would prove in the present study to be higher achievers than later borns, a prediction was made concerning the respondent managers' ordinal position and representation in line and staff management positions. The proposal concerning functional areas of employment was based on the assumption that line management positions more than staff positions provided for personal accountability, authority, and concrete feedback concerning performance. It has been reported in previous studies that high achievers more than low achievers desire accountability and feedback. Based on the above reasoning, Hypothesis
Six predicted an over-representation of first and only borns in line management positions when contrasted to later borns in first-line, middle, and top management.

The chi-square analysis conducted to test the proposal concerning functional areas of employment fell far short of significance. Early-born managers were found not to be over-represented in line management positions when compared with later borns in any of the management levels studied. The results suggested functional areas of employment were independent of birth position.

It was proposed that the classification scheme used by the author in classifying subjects as either line or staff managers may have been responsible for the negative finding. Many managerial positions, especially with the rise of functional authority in specialized areas, do not fit neatly into either the line or staff classification. There also may be little difference in satisfactions received by high achievers in either type of position. In addition, it would appear that academic specialization affects the type of work an individual will do. For example, an accounting major in college would be much more likely to work in the accounting area, a staff department.

Based on the lack of significant results for the line/staff variable, no suggestions for management were attempted. Proposals
for future research in this area will be suggested later in this chap-
ter, however.

**Formal Education as Affected by Ordinal Position**

Based on consistent research findings of an over-representa-
tion of early borns in college attendance, a proposal was made con-
cerning the relationship of the respondent managers' educational
levels and ordinal positions. Hypothesis Seven predicted that first
and only-born managers would have completed a higher mean
number of years of formal education than later borns in each level
of management.

The analysis of variance conducted to test the educational
levels of the subjects was supported only for first-line managers.
Early-born first-line managers were found to have a significantly
higher level of formal education than later-born first-line managers.
Findings for middle and top managers did not support the hypothesis.
In addition, only-born first-line managers reported a significantly
higher educational level than did first borns. Also, in the opposite
direction, first-born top managers were significantly higher edu-
cated than only-born top managers.

It was proposed that one reason for the findings that sup-
ported the prediction of a higher educational level for early borns
only for first-line management was because formal education
becomes less important as an individual moves up the managerial hierarchy. As one moves up in the management structure, actual job performance, not past educational achievements, becomes the more heavily weighted criterion for promotion. The differences found in first and only-born managers point once again to the conclusion made earlier that significant differences do exist between the two categories of early borns.

**Ordinal Position Influences on Early Parental Relationships**

Since much of what has been reported in the past about birth-order effects is based on the assumption of differential treatment by parents of children of varying birth positions, the present study included a very exploratory prediction concerning the respondents' early relationships with their parents. Although the available evidence is not clear and is often contradictory, Hypothesis Eight suggested that first and only-born managers would report a higher pattern of early parental relationships that reflected permissiveness, warmth, and higher expectations as contrasted with later borns. A bi-polar adjective phrase scale was administered to measure the subjects' perceived early relationships with both the father and the mother.

A two-way analysis of variance was utilized to test the proposed relationships. Findings failed to support the hypothesis in
that not one of the bi-polar adjective phrases for either the father or mother was found to be significant for ordinal position alone. The hypothesis predicting permissiveness, warmth, and higher expectations by parents for early borns was not supported. However, several significant findings were reported in an analysis for managerial level across all birth orders. A pattern emerged where it appeared that parents of higher level managers of all ordinal positions had higher expectations for the respondents, encouraged them more often, and showed affection and love more frequently.

Several reasons were proposed for the negative findings concerning birth order and patterns of reported early parental relationships. Some factors that possibly affected the results included the reporting of events that occurred years ago, variables not controlled in the present study, the personal nature and construction of the questionnaire, and the important effect parents have on all their children regardless of ordinal position. The incidental findings across all birth orders may have implications for management. It may be beneficial to explore the early developmental patterns of applicants or employees in order to more accurately identify high achievers.
SUGGESTIONS FOR FUTURE RESEARCH

Findings and conclusions reached in the present study appear to point to the need for further research in the area of ordinal position and managerial achievement. Additional research concerning only-born managers would certainly be warranted. The conclusions reached are only tentative, and additional studies are needed to support or modify the present findings. Although the present study attempted to include as many variables as practically possible, many areas of interest remain for future research. If possible, it would be desirable to include other factors that may have an effect on managerial achievement. The socio-economic level of the respondent's family and spacing and sex of any siblings are examples of areas that might prove useful.

Clearly, more studies in business and industry are needed. The present study is only one of two research projects that have been conducted in the business environment using practicing managers as respondents. As mentioned in Chapter I, much previous research has been conducted using children and adolescents as subjects. Studies in other industries or varying types of managerial positions may result in different findings. It could also be interesting to test for birth-order effects in managers of other countries. Also, there is a real need to explore for possible birth-order tendencies in female managers. The present study suffered from a
gap in the managerial levels. Management positions above the plant manager, but below the vice presidential rank, were not represented. Future research should attempt to include all managerial levels.

Since most previous studies indicating high achievement have concerned professions such as scientists and university professors, where a high level of formal education may be necessary, it may prove helpful to contrast the requirements for success in these high education professions with the requirements for achievement in the managerial profession. Significantly different requirements and circumstances for successful achievement may emerge.

The results indicating significant differences in several areas in first-born and later-born managers in the present study also merit further examination. Future studies may uncover significant relationships when exploring the similarities and differences in the two classes of early borns. Certainly the present findings in this area were unexpected.

The discussions concerning functional areas of employment deserve further consideration. Although no significant findings were recorded for the line/staff variable, the classification system utilized may have affected the negative results. In the future, researchers may need to redefine managerial position classifications into a more realistic scheme. It would appear that the increasing amount of functional authority evident in many staff positions may
have affected the present findings. Also, research in the area of birth order and vocational choice or academic specialization may be beneficial. It could be that certain ordinal positions can be found more often in specific areas of employment or in certain professions.

The positive finding concerning the education variable in early-born first-line managers needs to be explored to discover why this tendency is not evident in the higher levels of management. It was not entirely clear from the results of the present study, especially in light of the under-representation found in only-born first-line managers. The differences found in the education level of the two classes of early borns also needs clarification.

Several variables that approached significance merit additional study. This seems to be of potential importance in the tendencies noted for only borns. Only-born first-line managers appeared to be younger than either first-born or later-born managers. Also, only-born top managers were found to have a relatively higher mean level of total years of managerial experience than first borns. Additional research concentrated in the above two areas may provide clarifying results.

A last area of potentially productive future research centers on the findings concerning early parental relationships of the respondent managers. The results seem to suggest study of developmental
patterns across all ordinal positions. At least more research with improved methodology is needed to confirm the negative findings concerning ordinal position and reported early parental relationships.
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C. Reports, Proceedings, and Personal Communications


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National Aeronautics and Space Administration. Personal letter (September, 1971).


Dear Sir:

Successful managers are critical to the survival and profitability of every business firm. Most firms spend considerable time and expense to locate and employ capable managerial personnel. It is to assist companies in the petro-chemical industry in this search for productive managers that this research project is being conducted. Additionally, the results of this report are to serve as the foundation for my dissertation, a requirement for the Doctor of Philosophy degree in Business Administration at Louisiana State University.

You are being requested to provide information for this study because you have successfully entered the managerial profession. It is only through practicing managers like yourself that I can obtain the data necessary for this research. I hope you will help me in this study by providing the requested information as I feel the area of managerial effectiveness is most important to the continued success of every business firm.

Please be assured that the data you furnish will be treated confidentially. It is not necessary to place your name on the questionnaire. Additionally, the data will be combined and analyzed in such a manner that neither individuals nor specific firms will be identifiable from the completed dissertation. In addition to providing the information, please feel free to add any comments you feel pertinent on the back of the questionnaire.

After you have completed the questionnaire, please return it in the pre-addressed envelope provided. If you would like a summary of the results of this study, I would be pleased to send you one. You may either indicate that you would like the report along with your name and address on the back of the questionnaire or send a separate request to me at the location indicated on the return envelope.

Thank you for your time and effort in making this study possible. I look forward to receiving your reply. Your response means a great deal to me personally. It also makes a significant contribution to the study of managerial effectiveness in the petro-chemical industry.

Sincerely,

Gary E. Popp
Dear Sir:

Successful managers are critical to the survival and profitability of every business firm. Most firms spend considerable time and expense to locate and employ capable managerial personnel. It is to assist companies in the petro-chemical industry in this search for productive managers that this research project is being conducted. Additionally, the results of this report are to serve as the foundation for my dissertation, a requirement for the Doctor of Philosophy degree in Business Administration at Louisiana State University.

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Please be assured that the data you furnish will be treated confidentially. It is not necessary to place your name on the questionnaire. Additionally, the data will be combined and analyzed in such a manner that neither individuals nor specific firms will be identifiable from the completed dissertation. In addition to providing the information, please feel free to add any comments you feel pertinent on the back of the questionnaire.

After you have completed the questionnaire, please place it in and seal the envelope provided. Then return the envelope containing the questionnaire to the person within your company who is indicated on the envelope. He will return it to me unopened.

Thank you for your time and effort in making this study possible. I look forward to receiving your reply. Your response means a great deal to me personally. It also makes a significant contribution to the study of managerial effectiveness in the petro-chemical industry.

Sincerely,

Gary E. Popp
BIOGRAPHICAL DATA SHEET

1. AGE: ________

2. SEX (Check): Male _____ Female _____

3. EDUCATION: (Please complete the section that indicates the highest educational level obtained. If you have done graduate work or obtained an advanced degree(s), please complete both the section on undergraduate as well as graduate education.)
   a. Attended High School, did not graduate: Years completed (Circle) 1 2 3
   b. High School Graduate: (Check) ______
   c. Attended College, did not graduate: Years completed (Circle) 1 2 3
   d. Earned Bachelor's Degree: (Check) ______ Major ____________
   e. Earned Master's Degree: (Check) ______ Major ____________
   f. Number of Years Studied Beyond Master's: (Circle) 1 2 3 4 5

4. PRESENT POSITION:
   Title: _____________________________ Department: _____________________________
   Number of years in present position: _______

5. BRIEFLY STATE THE NATURE OF YOUR DUTIES: _____________________________

6. TOTAL YEARS OF FULL-TIME WORKING EXPERIENCE: _______

7. TOTAL YEARS AS A SUPERVISOR OR MANAGER: _______

8. TOTAL YEARS WITH PRESENT COMPANY: _______

9. NUMBER OF EMPLOYEES DIRECTLY UNDER YOUR SUPERVISION: _______

10. DO YOU HAVE UNDER YOUR DIRECT SUPERVISION EMPLOYEES WHO ARE SUPERVISORS OR MANAGERS? (Do not include employees who are members of a labor union.)
    No _______ Yes _______

   Part of this project is concerned with studying the influence a person's family has, if any, in determining the type of work he will do as an adult. The following questions are asked for this purpose.

11. WERE YOU AN ONLY CHILD?
    Yes _____ (If yes, do not answer questions 12 or 13 but go to the next page.)
    No _______

12. NUMBER OF CHILDREN YOUR PARENTS HAD, INCLUDING YOURSELF. (Circle one - do not include those who died within 60 days of birth.)
    1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 More Than 18

13. IN WHAT ORDER, COUNTING THE OLDEST CHILD OF THE FAMILY AS FIRST, WERE YOU BORN? (Circle one - do not count those who died within 60 days of birth.)
    1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 More Than 18

PLEASE TURN TO THE NEXT PAGE.
INSTRUCTIONS TO THE FINAL PART OF THE QUESTIONNAIRE

The purpose of the following part of the questionnaire is to obtain your opinion of the attention given to you by your father and mother when you were growing up. Please make your responses on the basis of your best judgment.

Here is how you are to complete these questions:

The direction toward which you place your check depends upon which of the two ends seems most characteristic of your relationship with your father and mother.

If you feel that the sentence at the top of the scale is very closely related to one end of the phrases, you should check as follows:

Always fair X:::____:____:____:____:____ Always unfair
Always fair __::__:____:____:____:____:____ X Always unfair

If you feel the sentence is quite closely related to one end (but not extremely), you should check as follows:

Complete freedom ___:__X:___:___:___:___ No freedom
Complete freedom ___:___:___:___:___:___:__X No freedom

If the sentence seems only slightly related to one side as opposed to the other (but is not really neutral), check as follows:

Understood me ___:__X:___:___:___:___ Did not understand me
Understood me __:___:___:___:___:___:__X Did not understand me

If you consider the sentence to be neutral or completely irrelevant to any of the two opposite phrases, you should place your check mark in the middle spaces:

Informal ___:___:___:___:___:___:___ Formal

IMPORTANT:

(1) Place your check marks in the middle of spaces, not on the boundaries:

This Not This
___:___:___:___:___:___:___

(2) CHECK EACH ITEM: Please do not omit any.

(3) Never put more than one check mark on a single line.

Make each item a separate and independent judgment. Work at a fairly high speed. Do not puzzle over individual items or try to remember how you checked similar items on the other sentence. It is your first impression that we want. On the other hand, please do not be careless because we want your true impressions.

PLEASE TURN TO THE NEXT PAGE TO COMPLETE THE FINAL SECTION OF THIS QUESTIONNAIRE.
When I was growing up, my FATHER:

<table>
<thead>
<tr>
<th>Had high expectations of me</th>
<th>Had low expectations of me</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always allowed me to make my own decisions</td>
<td>Never allowed me to make my own decisions</td>
</tr>
<tr>
<td>Frequently told me he loved me</td>
<td>Never told me he loved me</td>
</tr>
<tr>
<td>Showed affection often</td>
<td>Never showed affection</td>
</tr>
<tr>
<td>Spent much time with me</td>
<td>Spent no time with me</td>
</tr>
<tr>
<td>Was a democratic father</td>
<td>Was a dominant, authoritative father</td>
</tr>
<tr>
<td>Was permissive and tolerant in his actions</td>
<td>Was restrictive and limiting in his actions</td>
</tr>
<tr>
<td>Used lax (little) discipline</td>
<td>Used strict, constant discipline</td>
</tr>
<tr>
<td>Never expressed disappointment in me</td>
<td>Constantly expressed disappointment in me</td>
</tr>
<tr>
<td>Always encouraged me</td>
<td>Always criticized me</td>
</tr>
<tr>
<td>Accepted me</td>
<td>Rejected me</td>
</tr>
<tr>
<td>Was like myself</td>
<td>Was not at all like myself</td>
</tr>
</tbody>
</table>

When I was growing up, my MOTHER:

<table>
<thead>
<tr>
<th>Had high expectations of me</th>
<th>Had low expectations of me</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always allowed me to make my own decisions</td>
<td>Never allowed me to make my own decisions</td>
</tr>
<tr>
<td>Frequently told me she loved me</td>
<td>Never told me she loved me</td>
</tr>
<tr>
<td>Showed affection often</td>
<td>Never showed affection</td>
</tr>
<tr>
<td>Spent much time with me</td>
<td>Spent no time with me</td>
</tr>
<tr>
<td>Was a democratic mother</td>
<td>Was a dominant, authoritative mother</td>
</tr>
<tr>
<td>Was permissive and tolerant in her actions</td>
<td>Was restrictive and limiting in her actions</td>
</tr>
<tr>
<td>Used lax (little) discipline</td>
<td>Used strict, constant discipline</td>
</tr>
<tr>
<td>Never expressed disappointment in me</td>
<td>Constantly expressed disappointment in me</td>
</tr>
<tr>
<td>Always encouraged me</td>
<td>Always criticized me</td>
</tr>
<tr>
<td>Accepted me</td>
<td>Rejected me</td>
</tr>
<tr>
<td>Was like myself</td>
<td>Was not at all like myself</td>
</tr>
</tbody>
</table>
APPENDIX B
### SUMMARY SHEET

<table>
<thead>
<tr>
<th>Subject Number</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Sex</td>
</tr>
<tr>
<td>Undergraduate Major</td>
<td>Graduate Major</td>
</tr>
<tr>
<td>Management Level</td>
<td>Function</td>
</tr>
<tr>
<td>Total Years</td>
<td>Total Supervisory Experience</td>
</tr>
<tr>
<td>Total Years With Company</td>
<td>Total Years in Present Position</td>
</tr>
<tr>
<td>Family Size</td>
<td>Birth Order</td>
</tr>
</tbody>
</table>

**FATHER**

1. ________________________________
2. ________________________________
3. ________________________________
4. ________________________________
5. ________________________________
6. ________________________________
7. ________________________________
8. ________________________________
9. ________________________________
10. ________________________________
11. ________________________________
12. ________________________________

**MOTHER**

1. ________________________________
2. ________________________________
3. ________________________________
4. ________________________________
5. ________________________________
6. ________________________________
7. ________________________________
8. ________________________________
9. ________________________________
10. ________________________________
11. ________________________________
12. ________________________________
VITA

Gary Eugene Popp was born in West, Texas, on July 23, 1941. He graduated from West High School in 1959 and received his Bachelor of Business Administration degree in Management from Baylor University in 1963. In 1966, he received the Master of Business Administration degree from Texas Technological University.

He previously held positions in the Personnel and Industrial Relations Departments of the United States Department of Commerce, Ling-Temco-Vought, and Standard Oil (Indiana). He is currently Assistant Professor of Management at The University of Texas at El Paso.
Candidate: Gary Eugene Popp

Major Field: Management

Title of Thesis: The Effects of Family Ordinal Position on Managerial Level Attainment in the Petro-Chemical Industry

Approved:

[Signatures]

Dean of the Graduate School

EXAMINING COMMITTEE:

[Signatures]

Date of Examination:

December 5, 1972