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BIRTH ORDER DIFFERENCES IN THE USE OF
VERBAL AND PERCEPTUAL CLUES,

by

Julia Meyer

Bachelor of Arts

Thesis
Research Paper Submitted in Partial
Fulfillment of the Requirements for
the Master of Science Degree

Faculty of Psychology
in the Graduate School
Southern Illinois University
Edwardsville (Campus)
(August) 1969.

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I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY SUPERVISION BY Julia Meyer

ENTITLED "Birth Order Differences in the Use of Verbal and Perceptual Clues"

BE ACCEPTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF Master of Science

APPENDICES.....

John D. McCall
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INTRODUCTION

Psychologists in recent years have focused on birth order as one important variable to consider when accounting for individual development. Maccoby (1967) in a summary and critique of birth order literature, noted that ordinal position is shown to be related to many

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theoretical orientation can be attributed to two factors. The first is the chief characteristic of the birth order variable which is that in itself it explains nothing. It is an indicator of other phenomena. The second factor is that birth order correlates were usually accidentally discovered during other research. There is a need for systematic research, not in a theoretical framework, which will show what characteristics or behavior patterns correlate highly with ordinal position in the family.

Background

Birth order has been used to explain a variety of

CHAPTER I

INTRODUCTION

Psychologists in recent years have focused on birth order as one important variable to consider when accounting for individual development. Kammeyer (1967) in a summary and critique of birth order literature, noted that ordinal position is shown to be related to many social and psychological factors. Reasons for this relationship are not clear. Kammeyer's major criticism of previous research is that there has been no "systematic consideration of the interpretive theoretical connections between birth order and its correlates." This lack of theoretical orientation can be attributed to two factors. The first is the chief characteristic of the birth order variable which is that in and of itself it explains nothing. It is an indicator of other phenomena. The second factor is that birth order correlates were usually accidentally discovered during other research. There is a need for systematic research, set in a theoretical framework, which will show what characteristics or behavior patterns correlate highly with ordinal position in the family.

Background

Birth order has been used to explain a variety of the first born child from the accumulated evidence of

behaviors such as conformity (Sampson, 1962; Becker and Carroll, 1962), college attendance (Altus, 1966), and volunteering (Capra and Dittes, 1962); psychological personality characteristics such as dependency (Sears, 1950), need for affiliation (Schachter, 1959), and need for achievement (Sampson, 1962; Rossi, 1965); and finally, intellectual abilities and skills (Altus, 1966). Stanley Schachter (1959) found a greater need in first-borns for affiliation under stress. A replication of this study by Weller (1964) did not support Schachter's findings. A related study of one hundred sixty-five firemen in large and small firehouses (Smith and Goodchild, 1964) hypothesized that first-borns would interact more successfully because of stronger dependency and affiliative needs. It was found that first-borns did conform more, have less self confidence, were more efficient problem solvers in a group situation and were more often the official leader of the group. However, all these behaviors were related significantly to birth order only in the larger and more complex groups. There are many conflicting reports in the literature.

Much of the birth order research has centered on the first-born and explored his personality characteristics, and interaction patterns with parents and later born siblings. Abstracting from the literature, Kammeyer prepared a list of social learning experiences of the first born child from the accumulated evidence of

many studies showing that first-borns are different from later-borns by reason of these different social learning experiences. Although much of the knowledge about later-borns has been gathered as a by-product of studies concerned with first-borns, a similar list for later-borns has also been compiled by Kammeyer. The lists are presented in Table I.

TABLE I

SOCIAL LEARNING EXPERIENCES OF THE FIRST-BORN CHILD
AND THE LATER-BORN CHILD*

First-Born Child

Later-Born Child

A. Child and Parent Interaction.

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Parents attach great importance to his birth and being. 2. Parents possess greater ardor for him. 3. Parents have more time and energy to give to his socialization. 4. Parents know less about child-rearing because they lack experience. 5. Unbuffered from the adult world; he is more openly exposed to adult expectations and pressures. | <ol style="list-style-type: none"> 1. Parents attach less significance to his birth and being. 2. Parents have less ardor for him. 3. Parents have less time and energy to give to his socialization. 4. Parents are more experienced about child-rearing. 5. Parents will accelerate his independent mastery of his world to gain freedom from child-rearing. |
|---|---|

academic failure. It so intrigued him that he explored its history and then wrote The Privileged Seed (1964).

Harris First-Born Child vs. Later-Born Child: Story on
 whom birth B. Child and Sibling Interaction.

1. He will play a superordinate, parent surrogate role relative to his sibling.
 1. The first-born will make life difficult for him and be a source of anxiety to him.
 2. He will experience many stress situations vicariously by observing the first-born.
 3. He will learn much of his social behavior from peers.

C. Child, Parent, and Sibling Interaction.

1. Parents assign a position of responsibility to him relative to siblings.
 1. He will learn norms by observing parent and older sibling interaction.
 2. Siblings displace him as the principal object of parental attention.
 2. He will have to compete with an older sibling for parental attention.
 3. Parents will try to reassure and make up to him for this displacement.

Neither first born sons nor later born sons have any

*Adapted from Kammeyer (1967). analysis of their poems and writings points up some interesting differences

With the foregoing list of social learning and its experiences gaining recognition and acceptance as firm ground upon which to theorize and form testable hypotheses, interest in birth order studies has been greatly accelerated. Irving Harris was one who "stumbled across" birth order significance while looking for reasons for academic failure. It so intrigued him that he explored its history and then wrote The Promised Seed (1964).

musical and frequently give strong sense impressions.

Harris examined the writings of eminent men of history on whom birth order data were available. His evidence, although qualitative and impressionistic rather than quantitative and factual in nature, is so impressive in its scope and thoroughness as to throw the burden of proof on the reader. Harris concludes that in areas of symbolic cognitive activity first-borns are more distant from immediate sensory awareness, that given a set of objects they look for an organizing principle, a common denominator which is more important to them than any one of the objects. Later-borns are closer to immediate sensory awareness and given a set of objects, react to the individual uniqueness of the objects. The significance of individual differences in sensory awareness is better understood when illustrated with a concrete example. Neither first born sons nor later born sons have any corner on the poet's market. However, analysis of their poems and writings points up some interesting differences in their total approach to the subject of poetry and its function. First son poets tend toward the belief that poetry should have an ennobling, serious, moral purpose. Individual elements of their poems are well ordered and held firmly in place with a strong narrative or symbolic thread. Such a poem is Milton's "Paradise Lost." Later son poets tend toward lighthearted themes with little emphasis on morality. Their word arrangements are more musical and frequently give strong sense impressions.

Rather than reflect on the broad tapestry of life all at once, they may dwell on the essence of one small part of that tapestry as exemplified by Gertrude Stein's "a rose is a rose is a rose is a rose." First-borns tend to use words as adjuncts to ideas. Later-borns use words as extensions of themselves.

A pioneer in the field of birth order research and one who examined characteristics and behaviors of later-borns with the same interest as first-borns was Helen Koch at the University of Chicago in the early 1950's. Koch (1954) was interested in determining whether family constellation factors of sex of child, sex of sibling, ordinal position and difference in age between child and sibling were correlated with intellectual skills. In the study she examined the relationship of primary mental abilities in five and six year olds from two children families to sex of child and characteristics of his siblings. Of particular interest to the purposes of this thesis are her findings that the first-born who is an only child for from two to four years of age scores higher on the Verbal test. Conversely, the later born sibling who is challenged by a sibling two to four years older, is more observing of and alert to detail than the first-born. Later-borns scored significantly higher than first-borns in discriminations on the Perceptual Speed test. All subjects with a male sibling

appeared to be stimulated to greater alertness and scored generally higher overall on the test battery. Koch concluded that males are both more stimulated and more stimulating, perhaps through the jealousy they arouse or the wider experiences which they provide as siblings. Mothers give sons more attention than daughters and boys are permitted a wider range of social experiences than girls in our society. Differences in verbal ability and perceptual ability were not significant when siblings were closer than two years in age or farther apart than four years in age.

The investigator's own conclusion from the above review is that first-borns who are "onlies" for at least two years enjoy a unique parental relationship. Parents devote more time and attention to the early education and training of their first-born than to subsequent offspring. Not only the quantity but the quality of nurture varies between first and later born siblings. According to Sutton-Smith (1968), parents relate to first-borns not only more frequently but also more powerfully than to later-borns. Communication between the first-born and the adult world is often in terms of cause and effect rather than the descriptive and factual level of communication between his peers and siblings. The intellectual stimulation for first-borns of such close contact with adults at a time when language development is proceeding most rapidly apparently results in greater facility with

abstract meaningful verbal language. The first-born who is the only child for two to four years scores higher on verbal tests. Later-borns, with a sibling at least two but not more than four years older, scored higher on perceptual speed tests (Koch, 1954). Other studies have shown that first-borns are able to make better use of verbal clues and that later-borns are able to make better use of perceptual clues (Altus, 1966; Rosenberg and Sutton-Smith, 1965).

Problem

The present study was designed to see if birth order differences in verbal and perceptual skills also occur with college students. Unlike Koch's study with five and six year olds, which used standardized ability tests, this study used a two-dimensional geometric puzzle with manipulable pieces. Following one unaided trial, each subject was given either a verbal or a perceptual demonstration of the solution. The puzzle is sufficiently difficult to preclude sudden (or insightful) solution. Success must depend on understanding and following through on the clues. Consistent with previous findings, it was predicted that first-borns would make better use of the verbal directions, or clues, than the later-borns. The latter were predicted to make better use of the perceptual clues.

The significance of this study stems partly from its

use of a mature, college age group of subjects. If birth order differences found by Koch in verbal and perceptual skills continue to this later age level, there are important implications for the total educational and developmental processes up to the college years. Instructional materials with the same orientation for all students may be inappropriate if such differences persist throughout the formative years. This study also differs from other studies of verbal and perceptual abilities in that functional skills rather than static traits are compared for the birth order groups. In fact, the first and later born groups were matched on relative intelligence. Sex, another irrelevant variable, was controlled for through random assignment of an equal number of males and females to each experimental group. Control for general intelligence and sex of subjects was deemed necessary so that any differences might be attributed to birth order and its concomitant differential child-rearing practices. Such functional differences, if present, might follow more from life experiences correlated with birth order than from innate or hereditary differences.

Hypotheses

The present study, which concerns possible birth order differences in the use of clues for solution of a puzzle, gave one half of first born and later born

subjects a verbal clue. The other half of both groups was given a perceptual clue. The type of puzzle (two-dimensional with movable geometric pieces) would seem to favor those with greater perceptual-motor skills.

Hence, the inherent qualities of the puzzle should give the advantage to later-borns. Results were expected to support the following hypotheses:

1. Later-borns will perform better (have higher mean progress scores and a "success" of ten subjects or better) than first-borns regardless of type of clue.
2. Perceptual clues will facilitate solution more than verbal clues for all subjects.
3. Later-borns will perform better than first-borns when given perceptual clues.
4. First-borns will perform better than later-borns when given verbal clues.
5. During the unaided first trial later-borns will have significantly higher mean progress scores.

Figure 1. Experimental treatment procedure.

For the first unaided trial the experimenter said to the subject, "Here is a puzzle I want you to solve. Move

the large square piece CHAPTER II now in the lower left hand corner to the lower right hand corner. You cannot twist or pick up the pieces to do this. Just slide them."

METHODS

General Procedure was tape recorded as follows: the

"The two small squares and their position relative to the large square are the keys to solution of this puzzle. In the start position the two small squares are one above the other and are functioning as if they were a vertical rectangle. At times they must be moved side by side to function like the horizontal rectangles. This rearrangement occurs six times in a clockwise fashion around the large square, with the first rearrangement occurring directly above it. The large square moves in a triangular path during the

A comparison was made of first born and later born college subjects ability to make use of a verbal or perceptual clue to the solution of a geometric puzzle. All subjects were given the puzzle for one unaided trial of three minutes. Then one-half of the first born subjects and one-half of the later born subjects were given a verbal clue followed by a three minute trial, three times. The other half of the first born and later born subjects was given a perceptual clue followed by a three minute trial, three times. There were, then, four trials in all for each subject. Figure I shows a schema of the experimental procedure.

Initial Trials Experimental Trials

		verbal clue	perceptual clue
all subjects	first borns		
	later borns		

Figure 1. Experimental treatment procedure. in either

upper corner. Remember, the small squares rotate clockwise around the large square. For the first unaided trial the experimenter said to the subject, "Here is a puzzle I want you to solve. Move

the large square piece (pointing) now in the lower left hand corner to the lower right hand corner. You cannot twist or pick up the pieces to do this. Just slide them."

The verbal clue was tape recorded as follows: the puzzle."

"The two small squares and their position relative to the large square are the keys to solution of this puzzle. In the start

position the two small squares are one

above the other and are functioning as if

Over they were a vertical rectangle. At times

they must be moved side by side to

function like the horizontal rectangles.

This rearrangement occurs six times in a

clockwise fashion around the large square,

with the first rearrangement occurring

directly above it. The large square

From moves in a triangular path during the

rotation of the small squares. It moves

from the left hand corner along the

bottom one step, then goes straight to the

the top, over one step at the top and

straight down to the bottom, then over

one step into the right hand corner. At

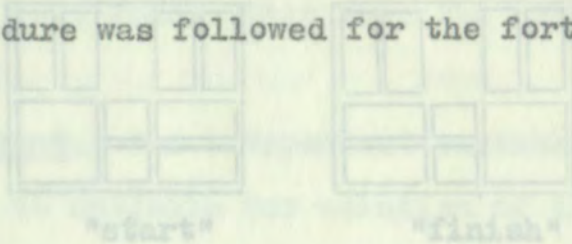
no time does the large square go in either

upper corner. Remember, the small squares

rotate clockwise around the large square

two experim. changing from vertical to horizontal each and
 the same pr six times." followed for the forty-eight
 later. The perceptual clue consisted of the experimenter
 saying to the subject, "Watch closely while I solve the
 Apparatus puzzle." The experimenter then proceeded silently to
 work the puzzle. When the clue had been given the puzzle
 was returned to the "start" position. . . . New York and the
 Magnetic Square Puzzle manufactured by William F. Drake &
 Sons, Inc., Grand Rapids, Michigan. There are nine
 geom. Over two hundred Introductory Psychology students
 at Southern Illinois University, Edwardsville Campus, 188
 were given a questionnaire (see Appendix A) which provided
 the necessary birth order information. They were also
 given the Similarities and Digit Symbol subtests of the
 Wechsler, slightly modified for group administration,
 (see Appendix B). . . . to solution as shown by Figure 3.
 Each From the questionnaire returns the first twenty-four
 males and twenty-four females meeting the criteria for
 first-borns (onlies for at least two years) and the first
 Variables twenty-four males and twenty-four females meeting the
 criteria for later-borns (having a sibling two to four
 years older) were selected as subjects. These birth order
 groups were next checked for equivalent intelligence
 indices. A subject's intelligence index is the mean of
 his standard scores from two special Wechsler subtests.
 The forty-eight first-borns were randomly assigned to the

two experimental treatment groups of twenty-four each and the same procedure was followed for the forty-eight later-borns.



Apparatus

The puzzle used in the experiment is similar to a small wood version sold by Shackman Co., New York and the Magnetic Square Puzzle manufactured by William F. Druke & Sons, Inc., Grand Rapids, Michigan. There are nine geometric pieces; one large square, two small squares one-fourth the size of the large one, and six rectangles one-half the size of the large square. Four of the rectangles are in a vertical position and two of them are in a horizontal position. Figure 2 shows the puzzle in the "start" and "finish" positions. There are twelve developmental stages to solution as shown by Figure 3. Each step must be passed through in turn in order to reach the solution.

Variables

Classification. Birth order is the crucial classification variable in this study, which compares first-borns with later-borns in ability to make use of clues in solving a puzzle. The criteria for designation as first born subjects is to have been the only child for at least two years. The criteria for designation as

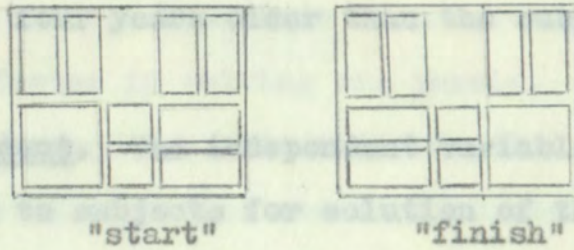


Figure 2. The puzzle shown in "start" and "finish" positions.

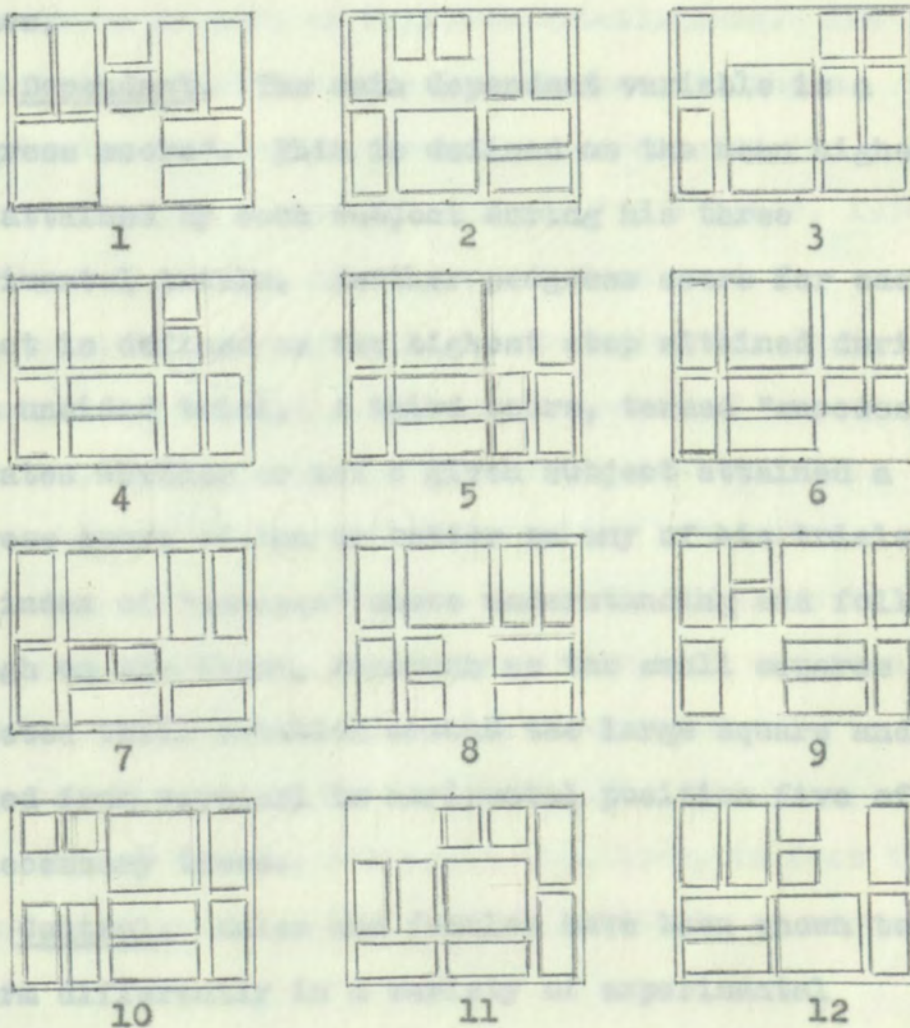


Figure 3. The twelve developmental steps to solution.

later born subjects is to have a sibling at least two but not more than four years older than the subjects, but themselves. factor in solving the puzzle. To ascertain

Similar Independent. The independent variable is the type of clue given to subjects for solution of the puzzle. There are two kinds of clue; a tape recorded verbal clue presented individually and a perceptual clue which consists of silently solving the puzzle while the subject watches.

Similar Dependent. The main dependent variable is a "progress score". This is defined as the mean highest step attained by each subject during his three experimental trials. Another progress score for each subject is defined as the highest step attained during the first unaided trial. A third score, termed "success", indicates whether or not a given subject attained a progress score of ten or better on any of his trials. This index of "success" shows understanding and following through on the clues, inasmuch as the small squares have completed their rotation around the large square and been changed from vertical to horizontal position five of the six necessary times.

Control. Males and females have been shown to perform differently in a variety of experimental situations. Control of sex as a variable confounding results was handled through random assignment of an equal

number of males and females to each treatment group. Intelligence was considered to be a second major, but irrelevant, factor in solving the puzzle. To ascertain similarity of groups on this variable, two subtests of the Wechsler, the Similarities and Digit Symbol, were given to assess verbal and perceptual-motor ability respectively.

A single index, the mean of their standard score transformations from raw scores, was used as an approximate measure of relative intelligence. The Similarities test was selected because it "shows conspicuous loadings in verbal comprehension in practically all factorial analyses." (Wechsler, 1958, p. 131). The Digit Symbol, apart from ease in administration and scoring, was selected for its

"consistent factorial loadings in nonverbal organization" (Wechsler, 1958, p. 132). The latter test requires translation of perceptual information into motor movements. The two subtests correlate with the full scale score .87 and .92, respectively, for eighteen and nineteen year old subjects. They have an intercorrelation, though, of only .56. This suggests that they do measure different abilities, in fact the two of interest here, namely, verbal aptitude and perceptual speed.

It is also noted that their mean progress scores differ more than might be expected by chance. The hypothesis

CHAPTER III

RESULTS

First-borns, half of whom received a verbal clue and half a perceptual clue to the solution of a puzzle, were compared on progress toward solution with a group of later-borns who received a parallel treatment. Table II shows means and standard deviations of progress scores earned by each group in their three experimental trials.

TABLE II
MEANS AND STANDARD DEVIATIONS OF AVERAGE PROGRESS SCORES EARNED DURING THE EXPERIMENTAL TRIALS

	First-Borns (N=48)		Later-Borns (N=48)	
	Verbal Clue	Perceptual Clue	Verbal Clue	Perceptual Clue
\bar{X}	5.86*	5.79	4.37*	5.49
SD	2.01	1.32	1.81	2.04

*Means on the same variable are significantly different ($t=9.93$, degrees of freedom=96, $p<.01$).

First-borns were found to make significantly better use of verbal clues than later-borns. That is, results from the t-test indicate that their mean progress scores differ more than might be expected by chance. The hypothesis

that later-borns will perform better significantly more often than first-borns regardless of type of clue is not substantiated by the results. This would suggest that there are no qualities inherent in the puzzle which would give the advantage to later-borns. Perceptual clues are not shown to facilitate solution more than verbal clues for all subjects. Neither are later-borns helped more than first-borns by perceptual clues.

A two-way analysis of variance test was used to analyze the same data for the four treatment groups considered together. Table III contains the analysis of variance results.

TABLE III
RESULTS FROM A TWO-WAY FACTORIAL ANALYSIS
OF VARIANCE IN PROGRESS SCORES

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F	p
Total	358.01	95	3.77	—	—
Clue	6.59	1	6.59	1.85	n.s.
Birth Order	19.22	1	19.22	5.40	.025
Clue x Birth Order	8.69	1	8.69	2.40	n.s.
Error	323.51	92	3.55	—	—

Birth order was found to be a significant variable in these results. First-borns performed better than later-borns regardless of clue. The reverse had been predicted. There were no significant differences in performance due to type of clue presented and no significant interaction effects between clue and birth order.

A chi-square analysis using somewhat different data, i.e.--"success scores" (reaching step ten or better on any one trial), was used to test the same hypotheses. None of the hypotheses were supported by this particular analysis. Specifically, no significant differences in the proportions of successful and unsuccessful subjects were found to be associated with birth order or with the type of clue presented to subjects.

Results of the means and standard deviations for the non-experimental variables, the Wechsler subtests and the progress scores for the unaided trial, are reported in Table IV. The fact that there is no significant difference between the means of the Wechsler subtest scores demonstrates that the two birth order groups are essentially equivalent in intelligence, or those skills measured by the subtests. Both first-borns and later-borns attained the same mean progress score on the first unaided trial, therefore, there is no support for the hypothesis that later-borns will do better than

first-borns during the unaided trial.

TABLE IV

MEANS AND STANDARD DEVIATIONS OF WECHSLER SUBTESTS,
COMPOSITE OF SCALED SCORES
AND PROGRESS SCORES OF UNAIDED TRIAL

	First-Borns		Later-Borns	
	\bar{X}	SD	\bar{X}	SD
WAIS				
Similarities	12.2	2.11	12.3	1.80
Digit Symbol	13.7	2.75	12.7	2.58
Composite	12.9	1.72	12.5	1.60
Unaided Trial	1.6	1.21	1.6	1.46

N=48 for both groups.

In summary, the two-way analysis of variance and t-test both show that birth order is a significant variable in performance on the experimental task. Specifically, the results show that first-borns improved more than later-borns regardless of which type of clue, verbal or perceptual, was given.

CHAPTER IV

DISCUSSION

The present study, which deals with possible birth order differences in the use of verbal and perceptual clues, shows that first-borns significantly excelled later-borns on the experimental task when a verbal clue was given. There was a trend for first-borns to also excel later-borns when a perceptual clue was given.

The experimental task was assumed to be of a perceptual-motor nature due to its two-dimensional geometric pieces requiring manipulation from a physically visible "start" position to a mentally visual "finish" position. Thus its inherent qualities were thought to favor later-borns who have been found to score higher on perceptual-motor tests (Koch, 1954). However, results from the experimental trials did not support the hypotheses based on this assumption. Later-borns did not have a higher mean progress score or "success" of ten or better significantly more often than first-borns regardless of clue. Neither did the perceptual clue facilitate solution more often than the verbal clue for all subjects. In fact, later-borns who had been predicted to do better than first-borns with the perceptual clue did not even do as well.

These results from the experimental conditions take

on yet more significance since the experimental groups were evenly matched on the unaided initial trial. They were also equated for sex and relative intelligence. Thus differences in progress scores obtained in the experimental trials seem to be due to the clues introduced.

Since the verbal clue, i.e.--being told how to solve the puzzle, was more useful to subjects than the perceptual clue, i.e.--being shown how to solve the puzzle, it would appear that the verbal clue is a superior clue. The main difference between "show" and "tell" in this case is one of calling attention to the general principles needed to work the puzzle. The experimental task is difficult and puts a premium on application of such general principles. The verbal clue presented the subject immediately with the general principles. The perceptual clue presented the subject with a series of concrete steps. Perhaps a special set is required to look for and find the general principles, which relate the successive movements of the pieces. However, there seemed no way to induce the proper set without invalidating the strictly perceptual quality of the clue.

Two conclusions may be drawn from this study. First-borns apparently maintain at college age an advantage in verbal ability. It is manifest in their significantly superior performance with the puzzle when

given a verbal clue. First-borns did less well with the perceptual clue than they did with the verbal clue, but still scored higher than later-borns. It may be that a tendency to look for organizing principles (which is a necessary component of verbal skill) is a general characteristic of first-borns. First born subjects may have seen more quickly the futility of trying to memorize individual steps to solution and started looking for the organizing principles. Harris (1964) believes this to be one of the main characteristics of first-borns. As far as perceptual-motor ability is concerned, first-borns may compensate for any such deficits during the developmental years to maturity.

The second conclusion is that later-borns do not seem to "catch up" with first-borns in verbal ability during the developmental years. They lag significantly behind first-borns in progress toward solution of the experimental task when given a verbal clue, and show a trend toward second place when given a perceptual clue.

These findings with college age students do not completely parallel those of Koch (1954) who worked with five and six year old subjects. In the present study first-borns do appear to possess greater verbal ability than later-borns, but later-borns do not demonstrate greater perceptual-motor skills, as Koch had found. The difference in findings may be due to the fact that

comparisons between first-borns and later-borns in this study were in terms of functional skills rather than static traits.

There is a special problem with comparing subjects in experimental tasks of the sort used here. This is the matter of distinguishing between functional skill demands inherent to the task and the trait skills which subjects bring to the situation. Careful procedures are needed to show which conditions account for the experimental results.

Should research substantiate and clarify such birth order differences, educators may be prompted to adopt new teaching procedures. At the present time first-borns would seem to have an advantage in the academic realm. Perhaps the greater than chance numbers of first-borns found in graduate school attest to this advantage. In time research may show us how to compensate for handicaps which may be associated with birth order.

Schachter, S. *The Psychology of Affiliation*. Stanford California: Stanford University Press, 1959.

Smith, M.K. and Goodchild, J.B. Affiliation in large and small groups. *Journal Applied Psychology*, 1963, 47, 300-303.

Sutton-Smith, B. Modelling and reactive components of sibling interaction. Address to Minnesota Symposium on child psychology, 1968.

Sutton-Smith, B. and Rosenberg, B.G. The dramatic sibling. *Parental and Child Skills*, 1966, 22, 993-994.

REFERENCES

- Wachler, D. The Evaluation of Adult Intelligence. Baltimore, Md.: The Williams and Wilkins Co., 1964.
- Altus, W.D. Birth order and its sequelae, Science, 1966, 151, 44-49.
- Becker, S.W. and Carroll, J. Ordinal position and conformity, Journal of Abnormal and Social Psychology, 1962, 65, 129-131.
- Capra, P.C. and Dittes, J.E. Birth order as a selective factor among volunteer subjects. Journal of Abnormal and Social Psychology, 1962, 64, 302.
- Harris, I.D., M.D. The Promised Seed. London: Free Press of Glencoe, Collier-MacMillan Limited, 1964.
- Kammeyer, K. Birth order as a research variable. Social Forces, 1967, 71-80.
- Koch, H.L. Doctrine of primogeniture. Genetic Psychology Monographs. Provincetown Mass.: The Journal Press, 1955.
- Koch, H.L. The relation of 'primary mental abilities' in five and six year olds to sex of child and characteristics of his siblings. Child Development, 1954, 25.
- Rossi, A.S. Naming children in middle class families, American Sociological Review, 1965, 30, 506-507.
- Sampson, E.E.' Birth order, need achievement, and conformity. Journal of Abnormal and Social Psychology, 1962, 155-159.
- Schachter, S. The Psychology of Affiliation. Stanford California: Stanford University Press, 1959.
- Smith, E.E. and Goodchild, J.D. Affiliation in large and small groups. Journal Applied Psychology, 1963, 47, 300-303.
- Sutton-Smith, B. Modelling and reactive components of sibling interaction. Address to Minnesota Symposium on child psychology, 1968.
- Sutton-Smith, B. and Rosenberg, B:G. The dramatic sibling, Perceptual and Motor Skills, 1966, 22, 993-994.

Wechsler, D. The Measurement and Evaluation of Adult Intelligence. Baltimore, Md.: The Williams and Wilkins Co., 1958.

Weller, L. Relationship of birth order to anxiety, Sociometry, 1962, 25, 415-447.

APPENDICES

APPENDIX A

Questionnaire for J. Mayer Study

Name _____

Class _____

APPENDICES

Instructions:

1. If you lived with your mother and/or father for the first eight years of your life put an X on the appropriate line.
 _____ Mother _____ Father
2. Using B for boy and G for girl, designate the sex of each child in your family starting with the oldest on line 1.
 1. _____ 2. _____ 3. _____ 4. _____ Other _____
3. Circle your own position in the family above.
4. Indicate the number of months difference in age between you and your two closest siblings in the spaces between the lines above.

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APPENDIX B

Graduate School

Southern Illinois University

Name: Julia E. Meyer Date of Birth: 9-12-29

Home Address: 433 Buena Vista
Edwardsville, Ill. 62025

Colleges or Universities Attended:

Southern Illinois University, Edwardsville Campus

Years: 1960-1969

Degree: Bachelor of Arts, Fine Arts

Major: Art

Special or Awards:

Spring Honors Day, 1962, 1963, 1964

Graduated cum Laude, 1965

Thesis Title: "Birth Order Differences in the Use
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Vita Sheet

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