BIRTH ORDER AND ACADEMIC ACHIEVEMENT[1]

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Regardless of orientation, most personality theorists are in agreement that early familial relationships and experiences exert a crucial influence on both childhood and adult behavior patterns.

The theoretical framework of the present study is primarily that of Harris (3, 4, 5). He proposes that the divergent tendencies of first and later born children have systematic intellectual repercussions, with first borns, specifically, developing a proclivity for abstract verbal functioning, due to intense interaction with their parents. This proposition was given some confirmation in Harris' work with learning problems (3) and by his review of empirical studies (4). The latter included reports on adult first borns who scored higher on the Miller Analogies Test, and on first born children who scored higher than later born children of equivalent ages on the verbal portion of IQ tests. This evidence has led the present authors to propose that the first borns' proclivity for abstract verbal functioning will, in turn, increase their probability of relatively high academic achievement.

Such a conceptualization is consonant with the view of birth order effects as presented by Adler (1, pp. 321-323) and further elaborated by Dreikurs (2). In general, the Adlerian contention is that differential parent-child-sibling interactions are in part determined by the ordinal position of a given child, and that specific personality organizations are reflections of goals toward which the individual had striven within the family constellation during the early years of his life.

Several studies found differences in parents' interactions with their offspring of different ordinal positions. Lasko (6) reports less consistent and less spontaneous expression of warmth by mothers toward their first child than toward later children and more friction between the mother and the first born. He also reports less anxiety, protectiveness, and interference by parents in the case of later children, and more permissiveness.

Sears (9) reports decreased parental delight at the prospect of having a child as the number of children in the family increases. Furthermore, the later the child, the less the probability that he will be breast fed. Rosen (8) claims that, in light of the intensity of the interaction of the first born with his parents, he tends to become very sensitive to parental expectations and sanctions. McArthur (7), similarly demonstrated that the first born is more likely to be adult-oriented, the second child, to be peer-oriented.

Such evidence has led Harris (5) to propose that the effects on the child of differential parent-child interactions are related to the question of how soon the child adopts the adult viewpoint, and that first borns tend to adopt the adult viewpoint earlier than later borns.

Based on the work reviewed, we propose that differing strategies are available to children in search of a satisfying family role. Choice of strategy in the case of the first born child is influenced by his reaction to a conflict generally experienced by him. Dethroned by the birth of a sibling, and removed from his position as exclusive recipient of parental care and attention, he has two alternatives: (a) to continue the old, infantile patterns of behavior which previously brought satisfaction; (b) to develop new techniques for obtaining gratification through parental reward, realizing that the sibling is now exploiting the infantile techniques. One strategy as yet unavailable to the younger sibling which the older rapidly finds successful, is linguistic development, intellectual exploration, and school achievement.

Of course, these considerations do not pertain to only children. However, they are nevertheless treated by, and interact with, their parents in a way which is very similar to that of first borns with siblings. For this reason most investigators have included only children in their samples of first borns, as is the case in the present study.

The present study is an attempt to test the hypothesis that the postulated verbal and intellectual advantage given the youthful first born persists throughout the school years, manifesting itself in better grades and higher scores on achievement and intelligence tests.

METHOD

The data for this study were obtained from two school systems in the Chicago area. Sample 1 consisted of available 7th and 8th grade students in a northern suburb of Chicago, characterized by relatively high and homogeneous socio-economic status. The following information was obtained from the school records: (a) 7th grade (N = 302, 155 males and 147 females)—IQ scores, scores on the California Achievement Test (reading, language, and total test), and birth order

data; (b) 8th grade (N = 313, 163 males and 150 females)—IQ scores, scores on the SRA HS Placement Test (all subtests), grade point average in the first semester of high school, and birth order data.

Data for Sample 2 were obtained within the context of a larger study at the Institute for Juvenile Research, and gathered from a school system in a southern suburb of Chicago.[2] Socio-economic status was lower than that of the first sample, and also varied more widely. From the school records, information was obtained for three age groups: (a) 5th grade (N = 80, 54 males and 26 females), (b) 8th grade (N = 104, 58 males and 46 females), (c) 11th grade (N = 173, 94 males and 79 females). IQ scores, grades per subject matter from the previous school year, and birth order data were available.

In addition to using the available achievement measures in Sample 1, we also derived a corrected achievement score defined as the algebraic difference between grade placement as determined by total achievement test score and grade placement based on age. In Sample 2, the overall grade point average was used as a general index of academic achievement.

Only children, who accounted for 10% of the two samples, were included with the first borns with siblings, as mentioned above. There was no control for family size. Sex was included as a variable. All the measures that were obtained were converted into standard scores to enable us to pool all the subjects within the two samples.

RESULTS

Two analyses were performed for each sample: (a) an analysis of variance (either three or two way, depending on the information available) in which an entire sample was used; (b) a one-way analysis of covariance for each sex by grade group, where IQ scores were held constant while we tested for differences in achievement measures between the birth order groups. The analyses followed the procedures outlined by Winer (10) for dealing with unequal cell frequencies.

Tables 2 and 4 present a summary of F ratios from the analyses of variance, and also the proportions of total variance accounted for by the various significant effects. These tables show that there are indeed meaningful differences between birth order groups among the variables used for comparison. No statistics from the analyses of covariance are presented, since none of the F ratios reached the required level of significance.

For Sample 1 (see Tables 1 and 2), the birth order groups differ significantly in their IQ scores, reading achievement scores, and school performance as indicated by grade point average. First born children are found to be superior to later borns. The interaction effect of grade x birth order on IQ (see Table 2) occurs because birth order differences are stronger in the 8th grade than in the 7th grade of this sample.

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[2]The authors wish to thank Dr. Elise E. Lessing for making the data available.

TABLE 1. MEANS AND STANDARD DEVIATIONS OF RAW IQ, ACHIEVEMENT TEST,[a] AND GRADE POINT AVERAGE (GPA)[b] MEASURES FOR SAMPLE 1 (NORTHERN CHICAGO SUBURB)

	Males				Females			
	First born		Later born		First born		Later born	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Grade 7	N = 69		N = 86		N = 69		N = 78	
IQ	113.71	8.43	112.55	11.16	114.30	10.88	115.59	9.75
Achievement[c]	1.25	1.27	1.37	1.35	2.08	1.24	1.96	1.21
Reading	82.51	18.93	78.44	21.53	83.03	20.26	79.99	23.71
Language	59.53	26.36	56.74	25.52	73.09	23.89	71.67	25.01
Total	70.94	23.25	65.93	24.26	76.36	23.82	74.39	24.50
Grade 8	N = 74		N = 89		N = 60		N = 90	
IQ	116.03	11.12	110.63	10.32	114.35	10.57	112.38	10.63
Achievement	1.91	1.31	1.39	1.19	2.22	1.19	2.13	1.04
Reading	77.09	21.78	66.00	26.84	70.17	25.55	67.80	24.31
Language	61.30	27.51	52.77	26.60	77.05	22.39	76.65	22.45
Arithmetic	67.85	27.27	66.61	25.35	71.95	22.71	74.19	22.91
Total	74.03	21.03	67.12	21.60	78.27	20.01	78.22	19.77
GPA	3.33	.65	3.02	.70	3.54	.74	3.51	.65

[a]All achievement test scores expressed in terms of percentile scores.
[b]GPA measures based on a 5-point scale.
[c]Based on grade placement and corrected for age.

The data from Sample 2 (see Tables 3 and 4) agree with those from Sample 1. Table 4 shows that birth order differences are to be found in IQ scores and actual school performance.

TABLE 3. MEANS AND STANDARD DEVIATIONS OF RAW IQ AND GRADE POINT AVERAGE (GPA)[a] MEASURES FOR SAMPLE 2 (SOUTHERN CHICAGO SUBURB)

	Males				Females			
	First born		Later born		First born		Later born	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Grade 5	N = 18		N = 36		N = 11		N = 15	
IQ	111.20	11.31	108.49	14.26	112.54	15.04	102.65	12.17
GPA	10.72	2.30	9.91	2.62	11.88	2.18	10.52	2.21
Grade 8	N = 28		N = 30		N = 23		N = 23	
IQ	103.55	12.86	98.47	11.20	106.30	12.67	100.48	12.89
GPA	9.27	2.61	8.95	2.38	11.62	2.34	10.47	2.60
Grade 11	N = 51		N = 43		N = 42		N = 37	
IQ	92.70	33.89	81.86	34.69	100.31	33.42	90.22	35.13
GPA	9.43	2.81	8.50	2.98	9.78	3.01	8.80	3.05

[a]GPA measures based on a 15-point scale.

TABLE 2. ANALYSIS OF VARIANCE F RATIOS OF STANDARD IQ AND ACHIEVEMENT SCORES FOR SAMPLE 1

Source	df	IQ	Achiev.[a]	Reading	Language	Arith.[b]	Total	GPA[b]
Grade (G)	1/604	.654	6.259** (11.62%)	30.877*** (71.20%)	.769		1.578	
Sex (S)	1/604	1.097	38.126*** (70.75%)	.181	69.609*** (89.29%)	4.432* (75.90%)	15.574*** (65.98%)	19.263*** (68.93%)
Birth order (BO)	1/604	4.597* (28.04%)[c]	2.151	7.148*** (16.48%)	2.611	.031	3.469	4.156* (16.16%)
G × S	1/604	1.092	.888	.924	1.634		.062	
G × BO	1/604	4.865 (29.67%)	2.422	.711	.389		.000	
S × BO	1/604	2.995	.208	1.563	1.325	.377	1.707	3.167
G × S × BO	1/604	.095	2.859	.958	.621		.213	

[a]Based on grade placement and corrected for age.

[b]Arithmetic and GPA measures available only for Grade 8. Consequently, F ratios are from a two-way analysis of variance. df = 1/309.

[c]Proportion of the total variance accounted for.

***p < .01   **p < .025   *p < .05.

In all but three of the birth order-sex-grade group comparisons, the means were in the predicted direction. First borns, including only children, consistently had higher mean scores than did later borns.

TABLE 4. ANALYSIS OF VARIANCE F RATIOS OF STANDARD IQ AND ACHIEVEMENT SCORES FOR SAMPLE 2

Source	df	IQ	GPA
Grade (G)	2/345	4.321*** (19.20%)[a]	9.558*** (29.35%)
Sex (S)	1/345	.287	9.237*** (28.36%)
Birth order (BO)	1/345	12.313*** (56.98%)	10.083*** (30.96%)
G × S	2/345	.698	2.006
G × BO	2/345	.185	.107
S × BO	1/345	2.487	.474
G × S × BO	2/345	.315	.099

***p < .01   [a]Proportion of the total variance accounted for.

DISCUSSION

The results support the hypothesis that first borns surpass later borns in intellectual ability and academic achievement. In light of the fact that the achievement measures correlate highly with IQ scores, and in light of the non-significant results obtained from the analysis of covariance, we must conclude that whatever differences were found between birth order groups are mainly due to differences in skills which the IQ tests measure.

The evidence is consistent with our theoretical formulation and confirms the prediction based upon that formulation. We theorized that first borns might be likely to cope with their dethronement at the birth of a sibling by capitalizing on their superiority over the younger child in intellectual, and especially language, attainments. Our evidence indicates that children in the preschool years should be studied, specifically with respect to possible differences in language ability between first and later borns, together with observations of parental techniques which are differential with respect to first and later borns.

Summary

The hypothesis was tested that first borns, including only children, are superior to later born children in school achievement. Among 972 children in grades 5, 7, 8, and 11, from two differing socio-economic levels, the hypothesis was confirmed in that first borns significantly excelled later borns in IQ and achievement. It is concluded that birth order is a sufficiently important variable to merit consideration when investigating school performance.

References

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Editorial Note

In 1936 N. E. Shoobs (1) did a questionnaire study with Brooklyn high school boys from whom he obtained information regarding birth order position and school achievement. From the latter he classified the subjects as to whether they were *advanced*, through skipping one or more terms; *retarded*, through having been left behind at least once; or *normal*. The relationship of this achievement record to birth order is shown in Table 1.

Shoobs' data show among other things that in the case of only children the number retarded was by far greater than in any other category. While various interpretations are possible, the data certainly point to the desirability of treating first children and only children separately, especially in studies of school achievement. Incidentally, Shoobs' study included 11% only children, coming very close to the 10% reported by Oberlander and Jenkin above.

The second major result from Shoobs' study is that even with the only children parceled out, first borns are less successful in school than any other birth order position. With the exception of only children, they show the smallest percentage

TABLE I. SHOOBS' PERCENTAGES OF BOYS WITH ADVANCED, NORMAL AND RETARDED HIGH SCHOOL PROGRESS IN RELATION TO BIRTH ORDER

High school progress			Birth order position				
	Only	1st	2nd	3rd	4th	Youngest	Total
Advanced	10.7	12.8	15.4	14.0	13.0	16.6	13.1
Normal	50.0	57.3	57.8	58.8	60.0	58.1	56.8
Retarded	39.3	29.9	26.8	27.2	27.0	25.3	30.1
Number	252	737	552	350	191	645	2301*

*The total is obtained by omitting the 645 youngest children as duplications of other positions, and adding 219 children from the 5th position upward, who are not included in the table.

of advanced and the largest percentage of retarded students. These results are in contradiction to those of Oberlander and Jenkin. While there is at present no ready explanation for this striking discrepancy, we thought these results of 30 years ago should be brought to the attention of the present-day reader for potential further consideration at some future time.

REFERENCE

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