OCCUPATIONAL AMBITIONS OF THE PARENTS

AND ACHIEVEMENT OF THE FIRSTBORN CHILD

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Abstract

A previous study in an American medical school found that male students tend to be firstborn, especially if their fathers suffer from a form of status incongruence in which their occupational status is lower than might be aspired to on the basis of their education. The present replication and extension in Sweden found: (1) Both male and female medical students tend to be firstborn. (2) Females are more often firstborn when their fathers are status incongruent. (3) For both males and females the proportion of firstborns is especially high among students who report that their fathers had frustrated occupational aspirations. The firstborn son takes his father as an occupational role model when the father is satisfied with his job, but takes the father's unattained role as a model when the father is frustrated. (4) As predicted on the basis of primogeniture, the birth order effects for males were stronger in rural areas than in the city, and this rural-urban difference did not hold for females. Ten methodological problems of birth order research are discussed.

This paper reports a cross-cultural replication and extension, conducted in Sweden, of a study by Cobb and French (1966) on the connections between parental job aspirations, birth order, and motivation of children to become doctors. It is an attempt to specify some of the intervening processes accounting for the over-representation of first-borns in high achievement groups, including medical students (Coker, et al., 1959). Recent reviews of the literature on birth order and social behavior (Warren, 1966; Altus, 1967; Sampson, 1965; Clausen, 1966) support the long-standing contention (Galton, 1874) that firstborns are over-represented among the eminent, especially if "eminence" refers to academic achievement. However, these same reviews contain very little in the way of explanation because few explanations have been consistently supported in past studies. The typical design relates birth order to an outcome variable (e.g., grades, acceptance to graduate or professional school, achievement in science) without presenting data on intervening processes.

What explanations have been offered follow from three distinct frames of reference, as discussed by Bayer (1967):

1. The physiological, attributing differences to intrauterine and perinatal influences.

2. The economic, attributing differences to a family's ability to pay for the firstborn's education.

3. The social-psychological, attributing differences to variations in socialization practices for children of different birth orders.

Although there is reason to believe that such physiological and perinatal factors as intrauterine environment, length of labor, and use

of forceps in delivery are related to birth order (Weller, 1965), no

systematic research has yet demonstrated that these factors can explain

differences in academic achievement. They do seem to be important in

accounting for physiological correlates of birth order. For example,

Udjus (1964) reported data showing that mean height decreases with

increasing birth order. Some authors attribute greater vitality or

physiological "efficiency" to younger mothers (Douglas and Blomfield,

1958) and use this as an explanation of such physiological correlates.

In dealing with a variable like academic achievement, however, it is

much more difficult to rule out nonphysiological factors related to

mother's age, such as changes in child-rearing practices.

The economic frame of reference seems more likely to be relevant,

and its reasoning is attractively simple:

> ... families who send their early-born children to receive
>
> higher education have spent so much on education that they
>
> cannot afford to send their later-born, especially if they
>
> have many children or are of low economic means (Bayer, 1967: 550).

However, in a study of over 8,000 Americans who received the Ph.D. degree

recently, Bayer found no support for hypotheses derived from this explana-

tion. Furthermore, Nichols (1964; cited in Altus, 1967) in a study of

National Merit Scholarship Finalists, found that among very high scorers

there was a remarkable over-representation of firstborns. Thus it seems

that the relationship between academic achievement and birth order exists

even at the pre-college level, where the economic argument carries less

weight.

Several social-psychological explanations have been attempted. After

considering them together, Altus (1967) concluded that

> ... the most prominent of the presumed social "causes" is
> likely to be the differential parental treatment accorded
> children of different ordinal positions, to greater "conscience"
> development, greater dependence on adult norms, and higher
> expectations of achievement falling to the lot of the first-
> born (Altus, 1967: 31).

According to this view, the observed intellectual superiority is due to
experience rather than genetics or physiology. Hunt's (1961) review of
the literature on the development of intelligence suggests that this is
possible. It also seems likely that much of the relationship is due to
differences in motivation; relationships between birth order and tested
intelligence are small in comparison with the "marked over-representation
of the first-born in studies based on achievement" (Barry, 1967: 442).

A recent study by Cobb and French (1966) lends support to the
"expectation of achievement" hypothesis by demonstrating that the oldest
to youngest ratio (expected to be one by chance) is especially high --
19/1 -- among male medical students whose fathers were high in education
and relatively low in job status. In interpreting these effects of status
incongruence the authors assumed that fathers with a high level of educa-
tion aspire to high status occupations; if they fail to achieve them they
suffer from feelings of frustration and failure. It was further assumed
that such fathers tend to project their frustrated occupational ambitions
more onto their firstborn sons than onto laterborn, either because of
stronger influences directed toward the oldest or because of the greater
susceptibility of the oldest to social influence (Sampson, 1965).

For the present attempt to replicate and extend the findings of
Cobb and French in another country, Sweden was chosen for two reasons.

First, the proportion of females in medical school is much higher there; Cobb and French could draw no conclusions about American female medical students because there were so few in their sample. Second, there has been some speculation about the effects of primogeniture on the birth order-achievement relationship, but apparently no one has investigated it. On the one hand, in a society which guarantees inheritance of the family farm to the oldest son, we might expect relatively few firstborn males to apply to medical school. On the other hand, if achievement expectations are higher for rural firstborn males and more attention is paid them, we might expect an unusually great over-representation of oldest males among Swedish medical students from rural areas. Part of the answer would be provided by statistics showing what proportion of oldest sons generally choose to stay on family farms in Sweden. Sweetser (1964) reports that in neighboring Finland the proportion has been steadily decreasing. Following Cobb and French we favored the latter hypothesis.

Our predictions were as follows:

1. Since admission to medical school requires both academic excellence and high motivation, there should be an over-representation of firstborns in medical school among males and females.

2. Among students whose fathers are high in education but relatively low in job status the birth order effect should be especially strong, offering further support for the "projection of frustrated ambitions onto the firstborn." This relationship should be stronger for males than for females, assuming that males are more likely to receive influence from the father.

3. A more direct measure of frustrated parental job ambitions,

as recalled by the child, should yield results consistent with the hypothesis about projection of frustrated ambitions. That is, among medical students whose fathers and/or mothers aspired to an occupation they never attained the over-representation of firstborns should be great. The effect should be especially strong in cases where the parent aspired to a medical career but failed to achieve it.

4. Because in rural Sweden primogeniture is still salient, we would expect the over-representation of oldest males to be greater for students with rural as opposed to urban backgrounds. This relationship should be less strong for females, to whom primogeniture applies less strongly or not at all.

Methodological Problems in Past Research

Several methodological problems have plagued past attempts to clarify the relationship between birth order and academic achievement. It is worthwhile to consider these briefly and keep them in mind.

1. Investigators have often lumped both sexes together, though it is now known that important sex differences occur. (See Sampson's critique of this practice, 1965.)

2. Sex composition of the sibship has usually been neglected.

3. Often there has been no control for size of sibship, a variable which is related to role definitions for children (Bossand and Bell, 1955; 1956) and to the nature of leadership in a family (Elder, 1962). In some cases failure to consider sibship size has led to spurious correlations (discussed by Chen and Cobb, 1960).

4. Socioeconomic status has been ignored. This variable is important for at least two reasons: (1) its relation to child-rearing practices;

and (2) its relation to sibship size.

5. Many of the samples studied have consisted of volunteers such
as patients in clinics and hospitals or subjects in an experiment,
usually college students. It is now known that volunteering is related
to birth order (Capra and Dittes, 1962; Suedfeld, 1964).

6. Many of the samples have been too small for adequate analysis;
often N is less than 50.

7. Birth order and age of mother at the time of birth have been
confounded. In general, the age of mothers of firstborns is lower than
the age of mothers of laterborns. This means that physiological
hypotheses are seldom ruled out. Also, there may well be important
differences in child-rearing practices of mothers of different ages.

8. Birth order and parental deprivation have been confounded.
Families which experience loss of one or both parents may be prematurely
limited in size. When using the oldest to youngest ratio as an index
it is important to consider that children in such families may be sub-
ject to special pressures, e.g., a son may have to quit school to
support his siblings.

9. A wide variety of indexes have been employed; some compare
firstborns with all laterborns, some distinguish between "earlier born"
and "later born," others divide the number of firstborns by the number
of lastborns. Often this variety makes generalization from one study to
others impossible.

10. Data on intervening processes have seldom been collected. The
usual procedure is to interpret results after the fact; often the relation-
ship between birth order and a dependent variable is discovered by
accident (Kammeyer, 1967).

After presenting our methods and results, we shall discuss how well we
have dealt with these problems.

Methods

The subjects of this study were all medical students in Gothenburg,
Sweden. 183 males and 112 females, approximately 50% of those contacted,
completed a three-page questionnaire mailed to them by a fellow student
in the winter of 1967. It contained questions concerning the parents'
ages, occupations, incomes, educational histories, and marital status --
the purpose being to control on these variables in the analyses presented
below. Also, the relevant family structure information was requested;
number of brothers and sisters and the ordinal positions of all children.
There were several questions designed to assess the subject's motivation
to attend medical school -- when he first wanted to go, what steps in the
Swedish school system he took or would have been willing to take to reach
medical school, and how much each parent encouraged him to attend.
Finally, there were questions asking the subject to recall whether his
father (mother) ever aspired to an occupation he (she) did not attain,
and, if so, what it was.

Most of our results are in the form of oldest to youngest ratios
for various subgroups of the sample studied. In a randomly selected
sample from a national population this ratio would be close to one,
since in every family with two or more children there is one oldest and
one youngest child. Of course, in a cohort of almost identical age, such
as the one studied, there may be a slight deviation from this ratio of
one, due to secular trends in the marriage rate or mean family size or
both. Inspection of these statistics for the appropriate years suggests

that for all of Sweden the effect was not large; and, within our sample,
an analysis of variance indicated that the mean ages of firstborn, inter-
mediate, and lastborn students were not significantly different. Because
the oldest to youngest ratio is expected to be one only for families
with two or more children, no only children are included in the analysis.

Results

Tables 1 and 2 show, for males and females respectively, the results
bearing on our hypothesis that firstborns would be over-represented among
Swedish medical students. In these tables observed and expected frequency
distributions are compared for oldest, intermediate, and youngest children
arranged according to sibship size (number of children in the family).

Insert Tables 1 and 2 about here

Both distributions are highly unlikely; chi-squares computed for
the "total" distribution in each table were highly significant (for males
$X^2 = 12.91$, $p < .005$; for females $X^2 = 16.51$, $p < .001$). The oldest to
youngest ratio for males is 2.00; for females it is 2.24.

These ratios are comparable to the 2.43 obtained for American male
medical students by Cobb and French, although we were surprised to find
that the ratio for Swedish males tended to be lower than the ratios for
American males and Swedish females. The effect of the primogeniture
tradition was expected to raise the ratio for Swedish males higher than
that of American males.[1]

One other unexpected result should be noted. Cobb and French found
that the oldest to youngest ratio increased with increasing sibship size:
1.5 for sibship size 2; 3.1 for 3; and 10.5 for 4+. They assumed that

this reflected the decreasing strength of the father's projected occupa-
tional aspirations for laterborn males. A similar but nonsignificant
trend is observed for Swedish males: 1.86 for sibship size 2; 2.15 for
3; and 2.20 for 4+. For the females, however, the highest ratio occurs
for families with three children (4.50), while the ratio for sibships
of four or more is little more than one (1.08).

Tables 3 and 4 present results bearing on our second and third
hypotheses. The underlying assumption is that fathers with frustrated
occupational ambitions project these onto their firstborn child,
especially if the child is a male. Cobb and French tested this thesis
indirectly by assuming that fathers who are relatively high in education
but low in occupational status will have frustrated ambitions. Their
study yielded an extremely high oldest to youngest ratio (19/1) among
males whose fathers were "status incongruent" in this sense.

Insert Table 3 about here

Table 3 represents an attempt to replicate the classification used
by Cobb and French. The three cross-hatched cells in the upper right-
hand corner of each half of the table are of interest, because these
contain ratios for students who have status incongruent fathers. For
males the hypothesis is not supported; the oldest to youngest ratio is
less than one. For females the results are as expected. In the three
cells of interest the total ratio is 5.00, compared to 2.37 for the
remainder of the table (p $<$ .05). However, Table 3 presents a weak test
of the hypothesis because no cases fell in the strongly incongruent cell.

These results must be considered in conjunction with Table 4. Here
the question about frustrated occupational ambitions was asked directly.

The results are reported in three categories: (1) father attained the occupation to which he aspired; (2) father aspired to a nonmedical job which he failed to attain; (3) father aspired to a medical or paramedical job (e.g., veterinarian) which he failed to attain. As stated in our third hypothesis, we expected the oldest to youngest ratio to be larger in the third category, because frustrated ambitions are assumed to be projected onto the firstborn child. Where these ambitions were specifically oriented toward the medical profession the effect was expected to be greatest.

The results support this interpretation. For both males and females the ratio shows a significant monotonic increase ($p < .05$) in the predicted direction. Notice in particular that all students are firstborn who reported having a father with frustrated ambitions to become a medical professional.

Insert Table 4 about here

In light of these results we question the validity of the coding scheme for Swedish occupations used in Table 3. The hypothesis which we intended to test by identifying status incongruence is supported by direct questioning, but is not supported (for males) for the status incongruence analysis. We attempted to replicate as closely as possible the coding system used for Americans by Cobb and French. Because we lacked detailed information about some of the jobs named, however, we often had to rely on annual income as an index of status. Recently other research has shown that income is not a good substitute for status or prestige ratings in analyses of status incongruence (Stanislav Kasl, personal communication). Further research on this question would require

more precise descriptions of father's occupation and a status classification system designed especially for Sweden.

The lower portion of Table 4 shows oldest to youngest ratios for the three categories of mother's job aspirations. For males, mother's aspirations apparently have little effect; this is probably due to the greater importance of the father as a role model for males and as the parent for whom occupation is most salient. For females there is a nonsignificant trend in the predicted direction: this suggests that the girls, compared to the boys, pay more attention to their mother's achievement expectations, as would be expected on the assumption that the mother is important as a role model for females. Note, however, that the ratio is less for unattained medical aspirations than for unattained nonmedical aspirations. Investigation of the responses involved indicated that most of the paramedical aspirations were directed toward <u>nursing</u>. Perhaps this does not have as strong an effect as ambitions to become a <u>doctor</u>.

Table 5 presents oldest to youngest ratios for various categories of childhood residence. We anticipated that the ratio for males raised in rural areas would be higher than for males raised in cities (where the emphasis on primogeniture has declined fastest). The results for males in Table 5 support our fourth hypothesis, although the number of cases in the farm category is small. If all categories except "city" are combined, on the grounds that some farm or village background is more likely than an urban background to be associated with the tradition of primogeniture, the hypothesis is definitely supported. The ratio for "city" males is 50/31; for "non-city" males it is 25/5 ($X^2 = 4.66$, $p < .05$).

Insert Table 5 about here

This procedure yields different results for females. The ratio of 3/5 in the farm category is based on too few cases, but it is lower than the 42/13 for "city" -- consistent with our hypothesis, although we did not predict the especially high ratio for urban females. Notice that for the village category the ratio is 11/2, as high as for males. This suggests that including these villagers in the same category with students from farms may be misleading.

The question which yielded these results allowed five possible answers; a check could be placed by "city," "farm," "moved from farm to city," "moved from city to farm," or "other (please specify)." All the cases reported in Table 5 as "village" were actually checked as "other" on the questionnaire, and "village" was specified by the respondent. The resulting high oldest to youngest ratio for the category may therefore be due either to an over-representation of firstborns among students from villages or to the greater willingness of firstborns to go out of their way to differentiate between "city" (which required only a check) and "village" (which required written specification). The latter explanation is consistent with the findings indicating that firstborns are more anxious to please others (Sampson, 1965; Dittes, 1961) and more compulsive (Kayton and Borge, 1967).

One further analysis involving place of childhood residence is reported in Table 6. Primogeniture applies to the firstborn male in a family, and it is therefore possible that its effect would be observable in the males regardless of whether they had older sisters. In Table 6 observed and expected distributions of position in the sonship (male children) are compared. They are separated into two categories, "city" and "non-city." For "city" the oldest to youngest ratio is 42/22; for

he is not happy with his position.

Discussion

We attempted to improve on past birth order research by controlling on sex, family size, and socioeconomic status in the relevant analyses. Some control on the sex composition of the sibship was achieved by comparing the sibship with the sonship. Several problems remained.

First, there is always a possibility that the over-representation of firstborns among high academic achievers is related to the mother's age at the time her child is born. Table 7 indicates that, as one would expect, for both males and females the mothers of laterborn children are older. We did not have a large enough sample to control on mother's age, and it is possible that this variable has some effect. It cannot explain the results of the analyses involving frustrated ambitions, however.

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      Insert Table 7 about here
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Second, there is the problem of parental deprivation through death or divorce, which is expected to decrease the size of sibship and thus increase the proportion of firstborns. However, when only children are excluded as in our analyses, the oldest to youngest ratio remains unaffected by this artifact. Thus any effects of parental deprivation must operate via changes in family structure. The oldest to youngest ratio for males who reported one or both parents absent was 10/16; for females it was 7/10. Both are obviously low compared to the overall ratios for each group. This suggests either that firstborns are responsible for their families in cases of

parental loss and thus are not likely to make it into medical school, or that decreased parental influence is responsible for lower aspirations in firstborns. We did not have enough cases to study these people separately. However, if they are removed from the sample, the oldest to youngest ratios are of course increased: for males it rises from 2.00 to 2.96 and for females from 2.24 to 3.27.

Third, although we included 300 people in our sample, often this was not enough to control on several variables and still have sufficient numbers to make confident comparisons. It would be worthwhile to include hundreds more in future studies of this kind.

.Fourth, because 50% of the students to whom questionnaires were sent did not return them, it is possible that more firstborns than last-borns chose to comply with our request. This might account for part of the high oldest to youngest ratio in the entire sample.

Finally, we were only able to begin to detect the intervening processes that would account for increased academic achievement of firstborns. A great improvement would be made by interviewing parents directly and by studying firstborns as children in interaction with their parents. A recent excellent study by Hilton (1967) has provided an example.

Most of these methodological problems arise when assessing the over-representation of firstborns in high academic achievement groups. They are, therefore, relevant to the results reported in Tables 1 and 2. However, they do not apply to within-group comparisons and hence do not discount the main finding of this study, that firstborns are especially numerous among high achievers who believe that their parents had frustrated occupational ambitions.

FOOTNOTES

1. Perhaps some of the firstborn sons stayed on family farms; see data presented below for rural-urban comparisons. The high female ratio may reflect the extra motivation and ability required for a girl to enter a difficult profession.

2. A similar analysis for females yielded an oldest to youngest ratio of 1.30 for "city" and 1.63 for "non-city." These are almost identical, and both are less than the ratio of 2.24 in Table 2.

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TABLE 1.   EXPECTED AND OBSERVED DISTRIBUTIONS OF MALES

| Sibship Size | Position in Sibship* | | | | | | Total | O/Y |
| | Oldest | | Intermediate | | Youngest | | | |
	Obs.	Exp.	Obs.	Exp	Obs.	Exp.		
2	39	30	0	0	21	30	60	39/21
3	28	20	19	20	13	20	60	28/13
4 +	11	9 1/3	24	21 1/3	5	9 1/3	40	11/5
Total	78	59 1/3	43	41 1/3	39	59 1/3	160	78/39

* This table excludes 23 only children.

TABLE 2.   EXPECTED AND OBSERVED DISTRIBUTIONS OF FEMALES

| Sibship Size | Position in Sibship* | | | | | | Total | O/Y |
| | Oldest | | Intermediate | | Youngest | | | |
	Obs.	Exp.	Obs.	Exp.	Obs.	Exp.		
2	25	17	0	0	9	17	34	25/9
3	18	10	8	10	4	10	30	18/4
4+	13	9 1/3	14	20 1/3	12	9 1/3	39	13/12
Total	56	36 1/3	22	30 1/3	25	36 1/3	103	56/25

* This table excludes 9 only children.

TABLE 3. OLDEST TO YOUNGEST RATIOS FOR CATEGORIES OF FATHER'S OCCUPATION

AND EDUCATION LEVEL*

		Father's Occupation		
	Father's Education	Owners, Managers, Professionals	Teachers, Technical, Sales	Laborers and Farmers	Total
Males	University	20/7	3/7	0/0	23/14
	Secondary	16/8	18/6	2/0	36/14
	Grade	1/1	8/2	9/6	18/9
	Total	37/16	29/15	11/6	77/37
Females	University	8/8	8/1	0/0	16/9
	Secondary	12/1	16/3	2/1	30/5
	Grade	1/0	4/4	4/3	9/7
	Total	21/9	28/8	6/4	55/21

* Cross-hatched cells indicate relatively high education level with

relatively low job status.

TABLE 4.   OLDEST TO YOUNGEST RATIOS FOR CATEGORIES OF FATHER'S

AND MOTHER'S JOB ASPIRATIONS

Father's Job Aspirations	Males O/Y Ratio	Females O/Y Ratio
Attained	52/32	33/16
Unattained (nonmedical)	14/4	18/3
Unattained (medical or paramedical)	5/0	4/0
Mother's Job Aspirations		
Attained	52/26	26/14
Unattained (nonmedical)	16/7	19/5
Unattained (medical or paramedical)	5/4	9/4

TABLE 5. OLDEST TO YOUNGEST RATIOS FOR CATEGORIES OF CHILDHOOD RESIDENCE

	Childhood Residence					
	City	Non-City				
	Total	Farm	Moved from farm to city	Moved from city to farm	Village	Total
Males		5/2	3/0	4/0	13/3	
	50/31					25/5
Females		3/5	0/2	0/0	11/2	
	42/13					14/9

TABLE 6.   COMPARISON OF SONSHIP DISTRIBUTIONS FOR CITY AND NON-CITY MALES

	Sonship Size	Position in Sonship*				
		Oldest	Intermediate	Youngest	Total	O/Y
City	2	33	0	17	50	33/17
	3	9	12	5	26	9/5
	4+	0	1	0	1	0/0
	Total	42	13	22	77	42/22
Non-city	2	13	0	4	17	13/4
	3	6	2	1	9	6/1
	4+	2	1	1	4	2/1
	Total	21	3	6	30	21/6

* This table excludes 50 only sons in the city category and 15 in the non-city category.

TABLE 7. MOTHER'S AGE AT BIRTH OF RESPONDENT

	Position in Sibship	Mean age of mother
Males	Only children	30.65 (N≈23)
	Firstborns	27.23 (N=78)
	Intermediates	29.98 (N = 43)
	Lastborns	34.00 (N = 39)
Females	Only children	30.33 (N = 9)
	Firstborns	28.45 (N = 56)
	Intermediates	31.59 (N = 22)
	Lastborns	35.88 (N = .25)