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BACKGROUND CHARACTERISTICS OF CHILDREN OF HIGH VERBAL ABILITY

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A representative sample (N 100) of eleven-year old Irish children of high verbal ability (the top ten per cent of scorers on a verbal reasoning test) was compared with a representative sample (N 461) of children of the same age of average verbal ability on a number of background variables Bright children were more likely to come from an urban than a rural background Significant differences between the groups were found on several family variables (social status, size of family, and the interest of both parents in the education of their children) The differences between the groups was not significant for ordinal position in family Neither was there any significant difference in sex representation in the two groups

Interest in high ability or giftedness seems to be as old as civilization From the time of the early Greeks, through shifting concepts of giftedness, and differences in emphasis on how the talents of the gifted might best be nurtured, the basic idea that the gifted are among the most precious resources of a society has stayed alive For all that, the number of empirical studies of the gifted over the past fifty years or so has not been very great

There is considerable variation in the criteria of giftedness or superior ability which have been used in different studies Scores on tests of intelligence (using varying cut-off points) have been used most frequently, but other criteria, such as eminence creativity and special talents, have also been employed In the present investigation we chose to study the top ten per cent of scorers on a verbal reasoning test Some investigators might not regard all such children as 'gifted' However, since they are well above average in verbal ability, they may be regarded as academically talented, and they obviously contain valuable intellectual resources for their society Correlates of their abilty are thus not without interest

There is now evidence from several studies carried out in varying conditions that the backgrounds of children of high ability differ in several ways from those of children of average ability For one thing, bright children tend to come from families of relatively high socio-economic status (3, 6, 7, 12, 16, 20, 21, 23) Terman (23) found that as many as 81 per cent of his subjects (most of whom had Binet IQs of 140+) came from professional, semi-professional and business homes, while only 11 8 per cent came from the homes of skilled workers Burt

(6, 7) reports basically similar figures for a sample of children with IQ above 130 in London, 70 per cent came from professional and clerical homes and 24 per cent from the homes of skilled workers When the criterion of brightness was dropped to IQ 120 however, lower status homes supplied a large proportion of the bright group, only 43 per cent came from professional and clerical homes while 44 per cent came from skilled homes

Findings on the relationship between high ability and family size are also in general agreement (2, 3, 12, 16, 23) Barbe (3) in his study of bright children (Binet IQ 120 to 164) in the public schools of Cleveland, Ohio, found that 22 per cent were only children, 42 per cent had one sibling, 20 per cent had two siblings and 7 per cent had three siblings Kincaid (16) reports a somewhat higher percentage in larger families for his sample of highly able (Binet IQ 150+) children in Los Angeles 79 per cent came from families of two or three children and six per cent from families of five to eight children Terman (23) reported an over-all correlation of – 271 between IQ and family size for 91 completed families in his Californian study

The relationship between ordinal position in family and high ability has been of interest since Galton's (10) enquiries showed a preponderance of first born and only sons in his list of eminent scientists The findings of more recent studies which have used objective tests of ability (1, 3, 16, 23) and teachers' nominations (4) support the view that first-borns are significantly over-represented in highly talented groups

The finding that high ability is related to such factors as socio-economic status and family size suggests that various influences in the home may contribute to the nurturing of high ability For example, the general positive relationship that has been reported between scholastic ability and various indices of parental interest in education (8, 9) might lead one to expect that parents of bright children would show greater than average interest in the education of their children There has, however been very little by way of empirical investigation of the attitudes and interests of the parents of bright children (cf 15)

Studies on the incidence of boys and girls in groups of bright children provide contradictory findings Terman's studies report a higher incidence of boys than of girls (22, 23), those of Lewis (17, 18) report a higher incidence of girls, while studies by Hollingworth (12) and Witty (25) found no significant differences in the representation of the sexes The conflicting findings are probably due to such things as differences between investigations in sampling, methods of identification and in the ages of subjects

While studies of the background of children of high ability are in general agreement on several counts, the present investigation was undertaken because no such study had previously been carried out in Ireland, findings of studies carried out in countries which differ from Ireland in their socio-cultural conditions cannot automatically be applied in this country Besides, for the present study, we had information concerning a national sample representative of all school-going children (with the exception of about 0 5 per cent of children attending schools for the handicapped), and so could avoid some of the possibilities of bias inherent in the selection procedures of some earlier studies, such as those of Terman

Two groups of eleven-year old children were selected for the present study, one of 'average' ability (with standard scores between 70 and 118 on a test of verbal reasoning which had been standardized with a mean of 100 and a *SD* of 15), and the other of high ability (with standard scores of 119+ on the same test) The groups were compared on a number of factors location (urban-rural), social status, family size ordinal position in family and parental interest in education The study also provided the opportunity of looking at possible sex differences in a national representative sample of bright children chosen on an objective basis

METHOD

Sample

Two samples (one of 'average' children and one of 'bright' ones) were selected from a parent sample of eleven-year old children (n 2,164) attending national and private (but not special) schools who had taken part in the standardization of a verbal reasoning test In selecting the parent sample, the population of schools was stratified by type of school administration (Catholic, Protestant, private) In the case of Catholic schools (attended by 97 per cent of the children) the schools were also stratified by location (city – town – rural) size, sex of children attending and whether the school was under lay or religious administration Within each school selected, all children in the relevant age range and in attendance on the day of testing were included in the sample The numbers of children in the various categories of Catholic schools were not proportional to the actual numbers in the population attending each category of school In drawing a sample of 500 children for further study, the proportions selected randomly for each category corresponded to the actual numbers in the population Children with standard scores of 119 or greater (i e the top ten per cent) were then excluded from

the sample of 500, leaving 461 children in the sample of children of 'average' ability

All children with standard scores of 119 or greater in the standardization sample (n 264) were eligible for inclusion in the sample of 'bright' children One hundred children were selected for this sample, in their selection, sex, type of school management, and, in the case of Catholic schools, location were taken into account The numbers selected in each category were proportionate to the numbers in these categories among children with standard scores of 119 or greater in the sample of 500

Procedure

All subjects took the Drumcondra Verbal Reasoning Test At a later date a questionnaire was sent to teachers of the pupils requesting information on (i) the occupation of the pupil's father or guardian, as an index of the social status of the family (ii) the number of children in the pupil's family (iii) the pupil's ordinal position in family (i e the number of older and younger siblings), (iv) the interest of the pupil's mother in the child's education rated by the teacher 'very interested' 'interested,' 'completely without interest,' or 'don't know,' (v) the interest of the pupil's father in the child's education rated by the teacher 'very interested,' 'interested,' 'completely without interest,' or 'don't know' All questionnaires were returned

RESULTS

Mean verbal reasoning score of the high ability group was 125 03 (*SD* 4 66), that of the average group, 97 91 (*SD* 13 85)

Fifty-seven of the bright group were boys 43 were girls While boys are over-represented, the over-representation is not statistically significant In the analyses that follow, boys and birls are treated as one group

Location Schools were categorized according to location urban (if located in Dublin, Cork, Dun Laoghaire, Limerick or Waterford),

TABLE 1

DISTRIBUTION OF BRIGHT AND AVERAGE PUPILS ACCORDING TO SCHOOL LOCATION

Location of school	Bright	Average
City	52	163
Town	17	85
Rural	31	213
Total	100	461

town (if in a town with a population over 1,500) and rural Table 1 gives the distribution of bright and average children in schools according to location The chi-square value for the data in this table is statistically significant (χ^2 10 41, *df* 2, $p <$ 01), the proportion of bright children is relatively high in city schools and relatively low in rural schools

Social class Each child was assigned to one of five social classes on the basis of his father's (or guardian's) occupation The classification of the British Census (11) was used with slight modification The five categories employed were 1 – professional, higher administrative and managerial, 2 – intermediate professional, administrative and managerial (and farmers over 30 acres), 3 – skilled occupations 4 – partly skilled occupations (and farmers of 30 acres and less), 5 – unskilled occupations Table 2 shows the distribution of pupils in the high and average verbal ability groups according to social class The chi square test was used to determine whether children of the five social classes are represented

TABLE 2

DISTRIBUTION OF PUPILS IN HIGH AND AVERAGE GROUPS ACCORDING TO SOCIAL STATUS

	Social Status	Bright	Average
1	Professional	8	15
2	Intermediate professional	35	123
3	Skilled	41	152
4	Partly skilled	11	81
5	Unskilled	5	90
	Total	100	461

in the high and average ability groups in proportion to their numbers in the total sample The chi-square value (χ^2 20 47, *df* 4) is significant at the 001 level Thus the representation of children from the different social classes is not proportional to their representation in the sample The main departures from the expectation of proportional representation occur in the case of the professional category in which children of high ability are over-represented and in the unskilled category in which high-ability children are under-represented

Size of family The mean size of the families of children of high ability is 4 44 (*SD* 2 38) while that of families of children of average ability is 5 71 (*SD* 2 73) Variance analysis yielded an F–value of 18 13 (*df* 1,55) which is significant at the 01 level Thus the children of high ability come from smaller families than children of average ability The numbers of children in the high and average ability groups according to size of family are presented in Table 3

TABLE 3

DISTRIBUTION OF PUPILS IN HIGH AND NORMAL GROUPS BY SIZE OF FAMILY

Number of children in family	Bright	Average
1	2	22
2	11	23
3	23	54
4	28	74
5	12	77
6	4	58
7	6	43
8	4	38
9	4	29
10	4	16
11-12	1	20
13+	1	7
Total	100	461

To examine the relationship between ability and different sizes of family, chi-square analysis was carried out The resultant chi-square value is 35 47 (*df* 11), which is significant at the 001 level There is a clear tendency for bright children to be over-represented in families of two three and four children

Position in family The numbers of children in each ability group for each ordinal family position are presented in Table 4 Chi-square analysis (χ^2 15 43, *df* 8) revealed no significant differences associated with ordinal position

TABLE 4

DISTRIBUTION OF PUPILS IN HIGH AND NORMAL GROUPS BY ORDINAL POSITION

Position in family	Bright	Average
1	32	95
2	26	97
3	19	88
4	5	60
5	11	48
6	2	23
7	3	19
8 9	1	24
10+	1	7
Total	100	461

Parental interest Data on parents' interest (father and mother separately) for the two groups are presented in Table 5 Chi-square

TABLE 5

DISTRIBUTION OF PUPILS IN HIGH AND AVERAGE GROUPS RELATED TO PARENTS' INTEREST IN CHILD'S EDUCATION

Interest level	Mother's interest		Father's interest	
	High ability	Average ability	High ability	Average ability
Very interested	63	189	46	139
Interested	27	198	36	175
Without interest	1	22	1	20
Total	91	409	83	334

analysis of the data for mothers revealed a tendency for the children of 'very interested' mothers to be over-represented in the high-ability group (χ^2 17 16, *df* 2, $p <$ 001) This analysis was based on 500 cases In twelve cases, the child's mother was dead, in another 49 cases, the teacher did not know the mother well enough to make a judgment If parental contact with the teacher can be taken as an index of interest in education on the part of the parent it is not unreasonable to assume that the parents whom teachers could not rate because of lack of information are low in interest When they are included in the 'without interest' category the relationship between ability and maternal interest, as one might expect is maintained (χ^2 18 41, *df* 2 $p <$ 001)

Fathers' interest was also significantly related to level of ability (χ^2 6 41, *df* 2, $p <$ 05) As in the case of mothers, children of fathers rated high in interest are over-represented in the high ability group The number of cases on which the analysis of fathers' interest is based (n 417) is smaller than in the case of mothers The fathers of 30 children were dead and teachers were unable to assess the interest of fathers in 114 cases Since fathers are less likely than mothers to have contact with teachers, it was not felt that one could assume as had been assumed in the case of mothers that fathers about whom teachers could not make judgments were likely to be low in interest

DISCUSSION

Our findings are in very close agreement with those of studies of the background of children of high ability that have been carried out in other

countries They indicate that a relatively small family of high social status, in which the parents are interested in their children's education is more likely to produce a child of high ability than a larger family of lower social class in which parents do not show interest in their children's education Our findings provide no evidence that either sex or ordinal position in family is related to brightness

There are some respects in which our findings diverge from those of other studies As far as family size is concerned, in our study, a bright child is most likely to belong to a family of two, three or four children These are slightly larger than have usually been reported (one and two child families) Our finding however is not surprising since the average size of family in Ireland is large, besides, the higher social classes have larger families in this country than elsewhere (5, 24)—a correlation of 097 between family size and social status for a representative sample of Irish eleven-year old children has been reported by Kellaghan and Greaney (14) The fact that bright children are not over-represented in one-child families is, however, surprising

In considering the findings concerning social class, it is important to bear in mind that while the proportion of children from professional homes in our sample that falls in the bright category is greater than the proportion from other types of home, the absolute number of bright children from professional families in the sample is small Intermediate professional (class 2) and skilled (class 3) groups contribute the greatest absolute numbers — 35 per cent and 41 per cent respectively The number of children from the three lower social groups is much larger than has been reported in studies in the United States (3, 16, 23) Britain (19) and New Zealand (21) This may be a function of differences in the criterion of brightness employed in the studies Our figures are remarkably similar to those obtained by Burt (6) early this century for children with IQ over 120

Children with scores in the top decile on a verbal reasoning test may be regarded as academically talented, and so, as we indicated earlier, contain valuable intellectual resources for their society Our study reveals that 57 per cent of such children come from the homes of skilled, semi-skilled and unskilled workers Since access to post-primary education of the academic type and third-level education is closely related to social class in Ireland (13 14), there is a danger that many of these children will not have the opportunity of receiving the type of education that will develop their intellectual ability to the full The possibility of this wastage of talent obviously deserves further investigation In the past the problems of the bright pupil have received little attention in this country If like

Terman, we accept that 'a nation's resources of intellectual talent are among the most precious it will ever have' (23, p v), it is clear that problems associated with the development of talent are not ones which we can afford to ignore in the future

REFERENCES

1 ALTUS, W D Birth order and its sequelae *Science* 1966, *151* 44 49

2 ANASTASI, A Intelligence and family size *Psychological Bulletin*, 1956, *53*, 187-209

3 BARBE, W B A study of the family background of the gifted *Journal of Educational Psychology*, 1956, *47*, 302 309

4 BRADLEY, R W, and SANBORN, M P Ordinal position of high school students identified by their teachers as superior *Journal of Educational Psychology* 1969, *60* 41 45

5 BURT, C *Intelligence and fertility* London Eugenics Society, 1946

6 BURT C The gifted child *British Journal of Statistical Psychology*, 1961, *14*, 123-139

7 BURT, C The gifted child In Bereday, G Z F, and Lauwerys, J A (Eds), *The yearbook of education 1962 The gifted child* London Evans, 1962 Pp 1 59

8 DOUGLAS, J W B *The home and the school* London MacGibbon and Kee, 1964

9 FRASER E D *Home environment and the school* London University of London Press, 1959

10 GALTON, F *English men of science Their nature and nurture* New York Appleton, 1875

11 GREAT BRITAIN REGISTRAR GENERAL *Census 1966 Classification of occupations* London HMSO, 1966

12 HOLLINGWORTH, L S *Gifted children Their nature and nurture* New York Macmillan, 1926

13 *Investment in education* Report of the Survey Team appointed by the Minister for Education in October, 1962 Dublin Stationery Office, 1966

14 KELLAGHAN T, and GREANEY V Factors related to choice of post primary school in Ireland *Irish Journal of Education* 1970, *4* 69 83

15 KELLMER-PRINGLE M L *Able misfits* London Longmans, 1970

16 KINCAID D A study of highly gifted elementary pupils *Gifted Child Quarterly* 1969, *13* 264 267

17 LEWIS, W D A comparative study of the personalities, interests and home backgrounds of gifted children of superior and inferior educational achievement *Journal of Genetic Psychology*, 1941, *59* 207 218

18 LEWIS, W D Sex distribution of intelligence among inferior and superior children *Journal of Genetic Psychology* 1945, *67* 67-75

19 LOVELL, K, and SHIELDS, J B Some aspects of a study of the gifted child *British Journal of Educational Psychology* 1967, *37*, 201-209

20 NICHOLS, R C, and DAVIS, J B Characteristics of students of high academic aptitude *Personnel and Guidance Journal* 1964, *42* 794-800

21 PARKYN, G W *Children of high intelligence A New Zealand study* London Oxford University Press, 1948

22 TERMAN L M, and BURKS B S *Genetic studies of genius Vol III The promise of youth Follow up studies of a thousand gifted children* Stanford, Calif Stanford University Press, 1933

23 TERMAN, L M, *et al Genetic studies of genius Vol I Mental and physical traits of a thousand gifted children* Stanford, Calif Stanford University Press, 1925

24 THOMSON, G H Intelligence and family size In Scottish Council for Research in Education, *The trend of Scottish intelligence* London University of London Press, 1949 Pp 101 117

25 WITTY, P A genetic study of fifty gifted children In Stoddard, G D (Ed), *Intelligence Its nature and nurture Original studies and experiments* Thirty-ninth Year book of the National Study for the Society of Education, Part II Chicago NSSE, 1940 Pp 401-409