Like minds: Similarities and differences in intellectual ability in gifted siblings

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Previous research

- Higher the birth order, the lower the IQ: First-borns score higher on intelligence and achievement tests than other children (e.g., Belmont & Marolla, 1973; Zajonc, 1976)
- This has been proposed to be due to changing the “intellectual environment” experienced by different siblings (e.g., availability of resources, exposure to adult speech/influences in early years, “tutor effect”)
- However, more recent longitudinal studies have found no relationship between birth order and intelligence (e.g., Berbaum & Moreland, 1980; Retherford & Sewell, 1991; Rodgers, et al., 2000)

Silverman & Waters (1987)

- 148 sets of siblings assessed on the Stanford-Binet L-M (1972 norms).
- Over one-third of siblings were within 5 points of each other, over three-fifths were within 10 points, and nearly three-quarters were within 13 points.
- The researchers concluded that “birth order does not account as much for the actual **ability** of the child as it does for his or her **achievement**.”

Linda Silverman – GDC website

- When one child in the family is identified as gifted, the chances are great that all members of the family are gifted.
- Second children are recognised as gifted less frequently than first-borns or only children. They often go in the opposite direction of their older siblings and are less likely to be achievement-oriented.
- Even the first-born identical twin has a greater chance of being accepted in a gifted program than the second-born!

The present study

- 226 sets of siblings were assessed over a period of five years using the Stanford Binet 5th Edition (SB5).
- There were a total of 474 children (215 females, 259 males) with a mean age at testing of 7 years, 6 months.
- There were no reported visual or auditory difficulties or illnesses in any of the children at the time of testing.

Mean IQ scores of sample

	Mean	Standard deviation
Full Scale IQ (FSIQ)	136.73	6.38
Nonverbal IQ (NVIQ)	134.98	6.97
Verbal IQ (VIQ)	135.69	6.72

Mean difference between siblings

The mean difference between siblings on FSIQ was 5.72 points (standard deviation 4.99).

Difference	Percentage of cases
Within 5 points	59.73%
Within 10 points	83.19%
Within 15 points	94.69%

Birth order results

There was very little difference between older and younger siblings on FSIQ.

Birth order	N	Mean FSIQ	s.d.
1	226	136.01	6.16
2	226	137.53	6.45
3	20	135.45	7.13
4	2	141.00	7.07

Birth order results

- First-born children scored higher than their younger siblings on 88 occasions.
- Younger siblings scored higher than first-born children on 121 occasions.
- There were 17 cases where siblings had identical FSIQ scores.

Same-sex and different-sex sibling sets

	No. of sets	Mean difference	s.d.
Same-sex	123	5.11	4.31
Diff-sex	103	6.45	5.62

Same-sex siblings were closer in FSIQ than siblings of different sex.

Analysis of factor scores

The SB5 measures five independent factors:

- Fluid Reasoning (FR)
- Knowledge (KN)
- Quantitative Reasoning (QR)
- Visual-Spatial Processing (VS)
- Working Memory (WM)

Difference in factor scores between siblings

The standard scores in the Knowledge factor were most consistent between siblings, with standard scores in the Working Memory factor least consistent.

Factor	Mean diff	s.d.
FR	8.17	6.00
KN	6.70	5.33
QR	7.77	6.03
VS	8.69	6.62
WM	10.09	7.33

Summary of results

- The majority of siblings tested on the SB5 achieved FSIQ scores within 5 to 10 points of each other (supporting the findings of Silverman & Waters, 1987).
- There was very little difference (~1.5 IQ points) between first-born and second-born siblings on FSIQ.
- There was some indication that same-sex siblings were less different in FSIQ than siblings of different genders.
- The factor score with the most consistency between siblings was the Knowledge (crystallised ability) factor

Further research

Our preliminary findings suggest further research into:

- Specific profiles obtained by siblings in the same family (e.g., differing scores on combinations of the five factors)
- Performance of gifted siblings on achievement testing (further examination of effects of birth order and IQ)
- Effects of age at testing on IQ scores
- Longitudinal analysis
- Multiple birth siblings (i.e., twins, triplets, etc)

Conclusions

- If one sibling has been identified as being intellectually gifted based on psychometric testing, it is highly likely that other siblings in the same family will also score within the gifted range.
- As birth order does not seem to affect IQ scores, lower academic performance in siblings of identified gifted children is probably due to underachievement rather than lack of ability.
- Once one child has been identified as gifted, it is important not to underestimate the ability of his or her siblings based on academic performance alone.

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