PRINT: ISSN 0970-9274 ONLINE: 2456-6608
J. Hum. Ecol., 12(4): 257-261 (2001)
DOI: 10.31901/24566608.2001/12.04.03

Gender Differences in Performance of 4-6 Years Old Slow and Average Learner Children on Stanford-Binet Intelligence Scale

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INTRODUCTION

Early in the twentieth century, intelligence was believed by some people to be a unique type of energy (or force) that each individual more or less had. According to be modern definition of intelligence, it is the capacity to learn and use information. In other words, it is the capacity of the organisation of information in efficient and cost effective manner to make use of the same. The intelligence which can be observed in daily life can be measured with the help of various tests developed on the basis of definitions and theories of intelligence. Alfred Binet was pioneer in developing tests to measure intelligence of school going children and to predict their school success in future. The Stanford – Binet Intelligence Scale is an individually administered intelligence tool that is the modern descendent of Alfred Binet's first successful test for children. It's 1986 revision measures general intelligence and four intellectual factors: quantitative reasoning, spatial reasoning, verbal reasoning and short-term memory of individuals between 2 and 18 years of age.

Among the four categories of learning potentialities in children *i.e.*, bright, average, slow and retarded, the most troublesome to the classroom teacher in schools for normal children are the slow learners. Slow learners are designated as those people whose scores fall within 75 or 80 to 90 IQ range on an intelligence test (Savage and Mooney, 1979). These are the children whose lower academic achievement is linked to limited learning capacity, rather than to a specific learning problem. On the other hand, average learners are those people whose IQ falls between 90-110 on Stanford – Binet Intelligence Scale (Binet, A).

Studies have proved that on the measure of overall IQ, there are no consistent sex differences. Boys and girls have approximately the same average IQ scores. It is only when the IQ score is broken into several separate skills or abilities that some pattern of sex differences emerge. Weber (1971) while establishing possible correlates of sex differences in mental abilities reported that males excel in spatial abilities and females in verbal abilities which is due to differences in timing of physical maturation. Pati and Dash (1990) reported that girls did significantly better than boys on the Progressive Matrices (PMI) and Stroop Colour and Word Test (SCWT). On the contrary, Verma (1983) reported that intelligence is affected by sex to some extent.

Keeping all the above facts in mind, the present investigation was conducted with the following objectives

- To identify the slow and average learner children.
- To compare the sex-wise performance level of identified children on the intelligence scale.

METHODOLOGY

Hisar city of Haryana state was selected. A list on schools from the colonies adjacent to the HAU campus was made after the researcher personally visited the schools. The selected schools from this list were namely Modern Defence School, Digvijay Memorial School, Shishu Niketan School, Cosmos School, Mountfort School, Guru Jambeshwar High School, Geeta Niketan, St. Paul School, Jeevan Jyoti High School and Ved High School. Eighty slow learner (IQ: 70-90) and 80 average learner children (IQ: 90-110) were selected purposively. Thus, a total of 160, 4-6 years old children served as the final sample of the study. Equal number of males and females i.e. 40 each from both the categories of children were also selected purposively.

Intelligence quotient (IQ) served as dependent variable and sex of the sample served as

independent variable in the present study.

Stanford – Binet Intelligence Scale, developed by Terman and Merrill (1972), was used to measure IQ of the sample and to know the difference in performance level of boys and girls in various subjects.

Frequency, percentage and two sample 'Z' test were used as statistical tools for analysis of the data.

RESULTS AND DISCUSSION

The perusal of table 1 reveals that equal percentage of slow learner boys and girls i.e. 40 had IQ in range of 80-85. About 10 per cent of girls belonged to category of 70-75 IQ range and 10 per cent boys were in the IQ range of 85-90. A quite high percentage of boys i.e. 32.50 belonged to lower IQ range of 70-75. The percentage of girls who belonged to high IQ range of 85-90 was 27.50. So, it can be said that slow learner girls belonged to higher IQ ranges (i.e. 80-85 and 85-90) as compare to slow learner boys. Mulia (1990) was also of the similar view and reported that the level of IQ of girls was higher than that of boys.

Table 1: Distribution of slow learner boys and girls in various IQ levels (N = 80)

IQ levels	*Girls (n = 40)*	*Boys (n = 40)*
70-75	4 (10.00)	13 (32.50)
75-80	9 (22.50)	7 (17.50)
80-85	16 (40.00)	16 (40.00)
85-90	11 (27.50)	4 (10.00)

Figures in parenthesis indicate percentage

Table 2 reveals that 37.50 per cent and 27.50 per cent average learner girls belonged to 100-105 and 90-95 ranges respectively. Only 12.50 per cent girls had IQ between 105-110. The table further shows that equal percentage of boys i.e. 27.50 per cent belonged to IQ ranges of 95-100

Table 2: Distribution of average learner boys and girls in various IQ levels (N = 80)

IQ levels	*Girls (n = 40)*	*Boys (n = 40)*
90-95	11 (27.50)	10 (25.0)
95-100	9 (22.50)	11 (27.50)
100-105	15 (37.50)	11 (27.50)
105-110	5 (12.50)	8 (20.0)

Figures in parenthesis indicate percentage

and 100-105. About one-fifth i.e. 20 per cent boys were in higher IQ range of 105-110 but higher than girls. Molloy et al. (1996) also found boys to be intellectually superior than girls.

At the end, it can be said that there was almost uniform distribution of both sexes in all the four IQ levels.

The table 3 displays the mean scores of 4-6 years old slow learner boys and girls when Stanford-Binet Intelligence Scale was administered on them.

The mean scores obtained by girls were 0.75, 0.82, 0.70 and by boys were 0.82, 0.85 and 0.90 for patience pictures, discrimination of animal pictures and sorting buttons, indicating better perceptual performance of boys than girls. The difference in performance for sorting button came out to be significant ($z = 2.30^*$) while for the rest two, the difference was non-significant. The mean scores of girls (0.92) was found higher than boys (0 67) in 'Comparison of balls' and this difference was found significant as indicated by z-value i.e. 2.94. Similarly, girls outperformed boys in 'Response to Pictures' as mean scores obtained were 0.57, 0.47 respectively. But, this difference was found non-significant. Both the groups had obtained mean scores of 1.0 in comprehension I.

It is obvious from mean scores, that girls performed comparatively better for Opposite analogies I (0.77), Pictorial identification (0.80), Discrimination of forms (0.85), Comprehension II (0.85) against 0.47, 0.62, 0.77 and 0.80 mean scores obtained by boys, respectively. So, it can be interpreted that girls are better than boys in language and perception of objects. This finding got strength from similar results obtained by various researchers like Pati and Dash (1990), Reppuci (1971) and Kurtz et al. (1988). The difference was found statistically significant in Opposite analogies I ($z = 2.91^*$) while for the rest, the difference was found non-significant. The mean scores of boys were 0.35, 0.67 and of girls were 0.27, 0.62 for Picture Vocabulary and Naming objects from memory, revealing better performance of boys. The z-values were found non-significant for both these tests i.e. Picture Vocabulary ($z = 0.72$) and Naming objects from memory ($z = 0.46$).

Boys outperformed the girls in Aesthetic

Table 3: Difference in performance of 4-6 years old slow learner boys and girls on Stanford-Binet Intelligence Scale (N = 80)

S.No.	Items	Mean scores		
		Boys (n = 40)	Girls (n=40)	'Z' calculated
III – 6				
1.	Comparison of balls	0.67	0.92	2.94*
2.	Patience: picture	0.82	0.75	0.82
3.	Discrimination of animal pictures	0.85	0.82	0.30
4.	Response to pictures	0.47	0.57	0.90
5.	Sorting buttons	0.90	0.70	2.30*
6.	Comprehension I	0.90	0.90	0.00
IV				
7.	Picture vocabulary	0.35	0.27	0.72
8.	Naming objects from memory	0.67	0.62	0.46
9.	Opposite analogies I	0.47	0.77	2.91*
10	Pictorial identification	0.62	0.80	1.76
11.	Discrimination of forms	0.77	0.85	0.86
12.	Comprehension II	0.80	0.85	0.58
IV-6				
13.	Aesthetic comparison	0.60	0.55	0.45
14.	Opposite analogies I	0.42	0.70	2.58*
15.	Pictorial similarities and differences I	0.35	0.75	3.92*
16.	Materials	0.57	0.75	1.68
17.	Three commissions	0.45	0.60	1.35
18.	Comprehension III	0.52	0.17	3.5*
V				
19.	Picture completion: Man	0.72	0.60	1.19
20.	Paper folding: Triangle	0.02	0.12	1.72
21.	Definitions	0.85	0.87	0.32
22.	Copying a square	0.77	0.72	0.51
23.	Pictorial similarities and differences II	0.32	0.27	0.48
24.	Patience rectangle	0.37	0.52	1.36
VI				
25.	Vocabulary	0.00	0.00	0.00
26.	Differences	0.00	0.00	0.00
27.	Mutilated pictures	0.40	1.00	2.06*
28.	Number concept	0.85	0.90	0.22
29.	Opposite analogies II	0.00	0.00	0.00
30.	Maze tracing	0.25	0.15	0.74
VII				
31.	Picture absurdies I	0.00	0.00	0.00
32.	Similarities : 2 things	0.00	0.00	0.00
33.	Copying a diamond	0.15	0.15	0.00
34.	Comprehension IV	0.10	0.00	1.45
35.	Opposite analogies III	0.00	0.00	0.00
36.	Repeating five digits	0.00	0.00	0.00

* Significant at 5% level of significance

comparison and Comprehension III as obvious from mean scores (0.60, 0.55) and (0.52, 0.17) respectively. The difference was significant in Comprehension III (z = 3.5*) but not in Aesthetic comparison (z = 0.45*). The mean scores of boys were found to be 0.42, 0.35, 0.57, 0.45 and mean scores of girls were found to be 0.70, 0.75, 0.75, 0.60 for Opposite analogies I, Pictorial similarities and differences I, Materials and Three commissions respectively indicating better performance of the latter. But the difference was significant only in Opposite analogies I (z = 2.58*) and Pictorial similarities and differences I (z = 3.92*).

It is clear from the mean scores, that girls performed better in Paper folding, Triangle (0.12), Definitions (0.32) and Patience rectangle (0.52) against 0.02, 0.85, 0.37 mean scores obtained by boys. Whereas the boys outperformed girls in Picture completion: Man (0.72), Copying a square (0.77), Pictorial similarities and differences II (0.32) against 0.60, 0.72, 0.27 mean scores obtained by slow learner girls. Further, statistically the differences were found non-significant in all of the tests mentioned under age V. Stewart (1986) also found insignificant effect of sex and culture on performance in Intelligence tests.

The slow learners of both sex i.e. boys and girls were unable to succeed in vocabulary, differences and opposite analogy I, tests of age III. As regard to tests such as Mutilated pictures and Number concept, there were differences in the mean scores of girls (1.0, 0.90) from that of boys (0.40, 0.85) indicating better performance of girls in these tests. The 'Z' values were found significant for only one test i.e. Mutilated pictures (z = 2.96*). Slow learner boys outperformed slow learner girls in Maze tracing as it is clear from their mean scores (0.25, 0.15) respectively.

Boys were ahead of girls in Comprehension II as obvious from their mean scores i.e. 0.10 and 0.00 respectively. The difference was found non-significant as 'Z' value calculated was found less than the 'Z' tabulated value. There was no difference between the two sex in Copying a diamond. Neither slow learner boys nor girls were able to perform the tests i.e. Picture absurdies I, Similarities: 2 things, Opposite analogies III, Repeating 5 digits.

So from the above table, it can be concluded that girls performed better in language and comprehension as compared to boys. These results

got support from the findings of Mohan and Sharma (1987) who found that females outperformed males in backward figure writing (BFW) and Paired Associates (PA).

The perusal of table 4 depicts the mean scores of 4-6 years old average learner boys and girls to see the difference in performance on Intelligence scale.

There was not marked difference between the mean scores obtained by average boys (1.0, 0.60) and average girls (0.95, 0.55) for the Comparison of bolls and Response to pictures respectively. Statistically, the difference was found to be non-significant. Further, from the mean scores it can be said that performance in Patience: pictures, Discrimination of Animal pictures, Comprehension I by boys (0.87, 0.97, 0.97) was lower than by girls (0.97, 1.0, 1.0) respectively. Again, the difference was found non-significant. Nagaich (1986), Bjerklie and Horton (1992) also found no difference in memory of boys and girls in intelligence tests. No difference was found in boys and girls in Sorting buttons.

The table further shows that there were slight differences between average boys and girls in tests for age IV. In case of boys, the mean scores were 0.65, 0.92 and 0.95, whereas in girls 0.57, 0.85 and 0.92 for the Picture vocabulary, Naming objects from memory and opposite analogies I, respectively. There was not marked difference between the mean scores obtained by girls (0.85, 0.95) and boys (0.82, 0.87) for the Pictorial identification and comprehension II respectively, revealing better performance of girls as compared to boys. Both the groups obtained the mean score of 1.0 in Discrimination of forms. None of the differences observed in these tests were found significant.

The girls performed better in Opposite analogies I (0.77), Pictorial similarities and differences I (0.85), Comprehension III (0.92) against 0.72, 0.57, 0.80 mean scores obtained by boys, respectively. A significant difference was found only in Pictorial similarities and differences I ($z=2.85^*$) while rest of the differences were non-significant. Likewise, boys were ahead in performance in Aesthetic comparison (0.87) and Materials (0.82) against 0.75, 0.75 mean scores obtained by girls respectively. Statistically, this difference was found non-significant.

Table 4: Difference in performance of 4-6 years old average learner boys and girls on Stanford-Binet Intelligence Scale (N = 80)

S.No.	Items	Mean scores		
		Boys (n = 40)	Girls (n=40)	'Z' calculated
III – 6				
1.	Comparison of balls	1.00	0.95	1.45
2.	Patience: picture	0.87	0.97	1.72
3.	Discrimination of animal pictures	0.97	1.00	1.01
4.	Response to pictures	0.60	0.55	0.45
5.	Sorting buttons	1.00	1.00	0.00
6.	Comprehension I	0.97	1.00	1.01
IV				
7.	Picture vocabulary	0.65	0.57	0.69
8.	Naming objects from memory	0.92	0.85	1.06
9.	Opposite analogies I	0.95	0.92	0.46
10	Pictorial identification	0.82	0.85	0.30
11.	Discrimination of forms	1.00	1.00	0.00
12.	Comprehension II	0.87	0.95	1.19
IV-6				
13.	Aesthetic comparison	0.87	0.75	1.45
14.	Opposite analogies I	0.72	0.77	0.51
15.	Pictorial similarities and differences I	0.57	0.85	2.58*
16.	Materials	0.82	0.75	0.82
17.	Three commissions	0.92	0.92	0.00
18.	Comprehension III	0.80	0.92	1.65
V				
19.	Picture completion: Man	0.90	0.95	0.85
20.	Paper folding: Triangle	0.17	0.20	0.28
21.	Definitions	0.95	0.90	0.85
22.	Copying a square	0.97	1.00	1.01
23.	Pictorial similarities and differences II	0.67	0.60	0.69
24.	Patience rectangle	0.65	0.60	0.46
VI				
25.	Vocabulary	0.00	0.00	0.00
26.	Differences	0.30	0.10	1.51
27.	Mutilated pictures	1.45	1.40	0.24
28.	Number concept	1.60	1.60	0.00
29.	Opposite analogies II	0.30	0.30	0.00
30.	Maze tracing	1.30	0.95	1.60
VII				
31.	Picture absurdies I	0.45	0.45	0.00
32.	Similarities : 2 things	0.05	0.15	1.03
33.	Copying a diamond	1.10	0.90	0.89
34.	Comprehension IV	0.40	0.30	0.58
35.	Opposite analogies III	0.15	0.20	0.39
36.	Repeating five digits	1.10	0.75	1.69

* Significant at 5% level of significance

It is obvious from the mean scores that girls performed better in Picture completion: Man (0.95), Paper folding (0.20) and Copying a square (1.0) against 0.90, 0.17, 0.97 mean scores obtained

by boys respectively. On the other hand, average boys performed better in Definitions (0.95), Pictorial similarities and differences II (0.67), Patience: Rectangles (0.65) against 0.90, 0.60, 0.60 mean scores obtained by average girls. Non of these differences were found statistically significant.

The mean scores of boys and girls for Vocabulary, Number concept and Opposite analogies II reveal that there was no difference in their performance. It is clear from the mean scores, that boys performed better in Differences (0.30), Mutilated Pictures (1.45) and Maze tracing (1.30) against 0.10, 1.40 and 0.95 mean scores obtained by girls, respectively. But, the difference was not found significant statistically.

The mean scores of boys were found to be 1.10, 0.40, 1.10 against mean scores of 0.90, 0.30 and 0.75 obtained by girls in Copying a diamond, Comprehension IV, Repeating 5 digits respectively, revealing better performance of the former. The girls were ahead of boys in Similarities: 2 things (0.15, 0.05) and Opposite analogies III (0.20, 0.15) respectively as obvious from their mean scores. Both the groups i.e. average boys and average girls had obtained same mean score of 0.45 for Picture absurdies I. The difference found in all these tests was found non-significant when 'Z' value were calculated.

After analysis, it can be said that these insignificant gender differences may be due to different genetic composition of both the sexes and due to different upbringing of boys and girls in the family. Kurtz et al. (1988) also pointed to the importance of home environment and the richness of children's metamemories as factors that influence performance on intelligence tests and academic achievement. He also highlighted the interactive effect of home and school on the children's cognitive development.

KEY WORDS Intelligence. Slow Learner. Average Learner. Language and Memory.

ABSTRACT A study was conducted on 160, 4-6 years old urban children of Hisar district for assessing gender differences in performance of slow and average learners on Stanford-Binet Intelligence Scale. There were equal number of males and females in the category of slow and average learners. Slow learner girls were found to be significantly better in language component of the intelligence scale than slow learner boys. There was difference in performance of average learner boys and girls on this scale but this difference was found to be non-significant. On the whole, there was no consistent gender difference on the measure of overall IQ.

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