THE PRACTICE EFFECT ON SEGUIN FORM BOARD TEST

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Introduction

There have been many tests of intelligence which require motor performance. Examples might be given of Alexander's Pass Along Test, Object Assembly (sub-tests), Pinter-Patterson Performance Scale, Aurthur Point Scale and Seguin Form Board Test, etc. The time scores of subject are converted into I.Q. scores for purpose of interpretation of the level of intellectual functioining. Repeated evaluation of the same subject on such tests invariably show better performance merely because of the effect of practice. Thereby the trial of the same test for purpose of re-evaluation after a short interval becomes questionable. Research work has not been done evaluating to what extent such practice may affect the results.

The present study is aimed to assess the effect of practice on one such intelligence test involving motor performance namely Seguin Form Board Test.

The Problem

To study the effect of practice on the Seguin Form Board performance.

The Subjects

Altogether 30 subjects, all males of age range 8 to 13 years were tested on the Seguin Form Board test. They were all students studying in the Demonstration School, Mysore. Table-1 gives the class-wise distribution of these subjects.

TABLE 1

Class	*No. of subjects*
4th standard	1
5th standard	2
6th standard	1
7th standard	23
8th standard	3

Presumably this entire group may be considered as bright students as the students gain entrance into this school by virtue of merit. All of them had normal hearing. Table-2 gives the age distribution of subjects. The mean age of group was 11.23 years.

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TABLE 2

Age	*No, of subjects*
8 years	1
9 years	1
10 years	1
11 years	17
12 years	7
13 years	3

Seguin Form Board Test

This is one of the earliest performance tests, commonly used for measuring intelligence either as a part of a battery or as an individual test. This test was developed by Seguin. The test consists of 10 wooden blocks of different geometrical shapes to be assembled into the respective empty spaces on a board. The general practice is that the subject is given three trials and in each trial the time taken for each trial is recorded. In terms of calculating the mental age the total time for 3 trials or the shortest time of 3 trials may be taken into account. But in the present study the total time of 3 trials has been taken. This test is supposed to be having high 'g' saturation (R.B. Cattell in A Guide to Mental Testing).

Instructions

' See here are 10 wooden blocks. Put these blocks in the right holes as fast as possible.' If the subject did not understand the instruction, then the task was demonstrated by investigator. 20 trials were given. Maximum time limit was 60 seconds (for each trial).

Each subject was given a series of 20 trials on the test at a time successively. The total time taken to complete the test under each trial was recorded. For purpose of analysis the performance of first 3 trials and last 3 trials were taken into account. These time scores were converted into Mental Ages which were further converted into I.Qs (Intelligence Quotient).

The major purpose of the study was to find out the specific effect of practice on Seguin Form Board Peiformance. If the effect of practice is considerable then it should make room for a significant difference between the mental age of first 3 trials and last 3 trials. There should also be a significant difference in the average time score of first 3 trials and last 3 trials.

Accordingly the following null hypotheses were framed.

Null Hypothesis-I: That there should be no significant difference between mental age scores of the group derived from the first 3 trials and last 3 trials.

TABLE 3

Sl. No.	1st 3 trials			Total time	Ave. of 3 trials (A_1)	MA_1	$I.Q_1$	last 3 trials			Total time	Ave. of 3 trials (A_2)	$M.A_2$	$I.Q_2$	$IQ_2 - IQ_1 = O$	$A_1 = A_2 - D$
	1	$S.F_2.B.$	3					1	$S.F._2B.$	3						
1	15″	14″	14″	43″	14.33″	13	118	13″	11″	13″	37″	12.33″	14½	132	14	2.00
2	20″	18″	14″	52″	17.33″	11½	144	15″	15″	15″	45″	15.00″	13	163	9	2.33
3	18″	15″	13″	46″	15.33″	12⅔	114	12″	13″	13″	38	12.66	14½	132	18	2.67
4	16″	14″	14″	44″	14.66″	13	100	13″	13″	13″	39	13.00	14	108	8	1.66
5	16″	16″	14″	46″	15.33″	12½	114	12″	13″	12″	37	12.33	14⅓	132	18	3.00
6	18″	14″	14″	46	15.33″	12½	125	13″	11″	13″	37	12.33	14½	145	20	3.00
7	17″	15″	15″	47″	15.66	12⅔	114	12″	13″	12″	37″	12.33	14½	132	18	3.33
8	18″	17″	14″	49″	16.33″	12	133	16″	14″	15″	45″	15.00	13	144	11	1.33
9	20″	15″	16″	61″	17.00″	12	92	13″	15″	15″	43″	14.33	13	100	8	2.67
10	22″	21″	20″	63″	21.00	10	91	17″	17″	17″	51″	17.00	12	109	18	4.00
11	24″	21″	16″	61″	20.33″	10	91	17″	13″	13″	37	12.33	14½	132	41	8.00
12	16″	15″	13″	44	14.66	13	118	15″	10″	14″	39	13.00	14	127	9	1.66
13	17″	14″	13″	44″	14.66	13	118	12″	12″	12″	36	12.00	15	136	18	2.66
14	17″	20″	18″	55″	18.33″	11	100	13″	13″	13″	39	13.00	14	127	27	5.33
15	15″	14″	19″	48	16.00	12½	104	15″	12″	10″	37	12.33	14½	121	17	3.67
16	11″	12″	11″	34	11.33	20	133	12″	10″	11″	33	11.00	21	140	7	0.33
17	20″	21″	15″	56	18.66	11	92	12″	15″	16″	43	14.33	13	108	16	4.33
18	15″	14″	17″	46	15.33	12½	114	12″	12″	14″	36	12.00	15	136	22	3.33
19	22″	20″	18″	60	20.00	10½	95	15	14″	18	47	15.66	12½	114	19	4.34
20	19″	22″	20″	61	20.33	10	91″	14″	16″	15″	45	15.00	13	118	27	5.33
21	20	15″	14″	49	16.33	12	100	10″	11″	13″	34	11.33	18	120	20	5.00
22	15	12″	14″	41	13.66	13½	113	11″	11″	12″	34	11.33	18	120	7	2.33
23	16	16	17	49	16.33	12	100	13″	16″	13″	42	14.00	13½	113	13	2.33
24	20	17	13	50	16.66	11	92	11″	14″	11″	36	12.00	15	115	23	3.66
25	17″	13	12	42	14.00	13½	123	12″	10″	11″	34	11.33	20	133	10	2.69
26	17″	15″	15″	47″	15.66″	12⅔	144	15″	13″	14″	42	14.00	13½	123	9	1.66
27	18″	11″	13″	42″	14.00	13½	123	11″	13″	11″	35″	11.66″	16	145	22	2.34
28	20″	18″	17″	55″	18.33	11	100	14″	12″	15″	41″	13.66″	13½	123	23	4.67
29	18″	15″	14″	47″	15.66	12½	114	12″	15″	14″	41″	13.66″	13½	123	9	2.00
30	24″	17″	15″	56″	18.66	11	92	15″	15″	11″	41″	13.66	13½	113	21	5.00
Total:	543	479	451	1469	493.02	367.5	3272	391	392	380	1181	393.59	430.4	3784	512	96.63
Aveg:	18.1	15.96	15.33	47.63	16.43	12.26	109.06	13.03	13.06	12.66	39.37	13.12	14.35	126.13	17.0	3.221
A.D.:					1.77	1.78						1.43	3.46			

Null Hypothesis II: That there should be no significant difference between the average time scores of the group in the first 3 trials and last 3 trials.

Results and Discussion

The obtained results from the study are given in Table-3. The data for each subject is presented in terms of time scores, mental age scores and I.Q. etc. The same table also gives the mean scores and the S.D. Scores under separate columns.

It may be seen from the table that the average time scores under trials 1,2, 3 are 18.11, 15.96 and 15.33 respectively expressing a gradually reducing trend. On the other hand the average time scores of the last 3 trials are 13.03, 13.06, and 12.66 respectively. It can be seen that the difference among last 3 values is almost negligible. Perhaps by the time the subject takes the 20th trial, he will have reached the saturation point beyond which practice may not have any effect on his performance. The average time scores on the first 3 trials for the group is 16.43 and the average time for last 3 trials is 13,12 which reflects that the group performance goes on improving from trial after trial.

The mean mental age of the group for the first 3 trials is 12.25 and for the last 3 trials is 14.35 respectively, which reflects a definite improvement in last 3 trials. The same fact is reflected in the I.Q. scores also namely 109.06 and 126.13 respectively. The difference columns for l.Qs and Average reaction time show no -ve value for any subject, clearly indicating that every subject improves in his performance in the last three trials when compared with first 3 trials.

The S.D. values for the M.A. scores under first 3 trials and last 3 trials are respectively 1.78 and 3.46 respectively, pointing out greater inter-individual variability in the mental age scores in the last 3 trials. Possibly the effect of practice brings about greater variability among the subjects in the same later trials. The S.D. values for the average time scores for the first 3 trials and last 3 trials are 1.77 and 1.43 respectively. This points out the inter-individual variability among the individuals in some what reduced in the later trials when compared with first trials.

Table—4 below gives the mean and sigrna values of average total time for first 3 trials and last 3 trials.

TABLE 4

Average Total Time

	First 3 trials	Last 3 trials
M	16.43	13.12
	1.77	1.43
	N =30	
	=0.75	(Correlation time between average time scores of first and last 3 trials for 30 subjects)
Mean difference	=3.31	
	=0.24	
SEDT	=13.79	Significant at .05 and .01 levels.

When these results were subjected to ' t' test of significance the obtained T value was 13.79 which was significant both at. 05 and .01 probability levels. Therefore the average reaction time scores for the last 3 trials were significantly lower when compared with the average reaction time score of first 3 trials. This clearly signifies that the effect of practice is to improve the performance. So the null hypothesis that there is no significant difference in average reaction time between first and last 3 trials can be considered as not tenable.

Table-5 below gives the Mean and Sigma values for the mental age scores for the first 3 trials and for last 3 trials.

TABLE S

Mean Mental Age

	First 3 trials	Last 3 trials
M	12.26	14.35
a	1.78	3.46

N =30

r =0.93 (Correlation between mean mental age scores of first and last 3 trials for 30 subjects)

Mean difference=2.09

=0.35

SEDT =5.77 Significant at .05 and .01 levels.

When the mean difference in the mental age scores was subjected to the test of significance the ' T' value turned out to be 5.97 which was significant at the 0.05 and 0.01 levels of probability. This must be taken to mean that the mental age score of the last 3 trials show a definitely significant gain over the mental age scores obtained from the first 3 trials.

So the null hypotheses that there is no significant difference in mental age scores between the first and last 3 trials can be considered as not tenable.

The time scores obtained in all 20 trials for each subject with the mean scores for each trials is given in table-6. From the table it can be seen that the time scores gradually goes on decreasing from trial to trial. At least this is the general trend. The total time scores and the mean time scores for the different trials clearly indicate this.

The mean time scores for the 20 trials was represented on a graph.

From the graph it was inferred that the reduction in time score till the 5th trial was considerable and.from these onwards the leduction is some what less, reaching the minimum in the 20th trial. The effect of practice persisted till the 11th trial in a pronounced fashion but from there onwards it was negligible.

Summary and Conclusion

The sample consisted of 30 normal children of male six and the age level ranging from 8 to 13 years. The children are drawn from Demonstration School, Mysore.

Art Intelligence Test was administered to test the effect of practice on Seguin Form Board. The purpose of the investigation was to the effect of practice on performance on an intelligence test namely Seguin Form Board.

The following conclusions can be drawn from the results of the study.

1. The effect of practice is to reduce the time score on the performance on the S.F.B.
2. There is significant difference between M.A. scores of the group of the first 3 trials and last 3 trials,
3. There is significant difference in the average time scores of the group between first and last 3 trials.
4. Significant reduction in the time scale takes place till the 11th trial.

The results of this study clearly points out that with practice the subject goes on improving the performance. Obviously this will be reflected if expressed as mental age scores. Therefore allowances must be made for the effect of practice when the test is repeated for the second time or a third time.

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