

THE RELATIONSHIP BETWEEN CHILDREN'S TESTED
INTELLIGENCE AND THEIR HOBBY
PARTICIPATIONS*

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The present analysis is made from data taken from the *Coordinated Studies in Education*, a study made under the general supervision of an advisory committee composed of Dr. H. A. Greene of the University of Iowa, Dr. Le Roy A. King of the University of Pennsylvania, Dr. J. C. McElhannon of Baylor University, Dr. I. R. Obenchain of the Birmingham City Schools, Dr. Henry J. Otto of the W. K. Kellogg Foundation, Dr. David Segal of the United States Office of Education, Dr. M. J. Van Wagenen of the University of Minnesota, and the writer, who served as chairman.

In the instance of the present consideration sixth grade children alone are involved. Of a total of 4,779 cases, 2,342 are boys and 2,437 are girls. They were drawn from 258 schools located in 31 states, a rather large proportion of which are in the north-central and north-western sections of the United States, although all regions are represented.

Several different types of records were obtained on each child. Among these were intelligence quotient data as derived from the Kuhlmann-Anderson *Tests*, and a statement of the hobby or hobbies in which each child engaged. This latter record was prepared by the teacher after conference with the child. A child could be listed as having several specified hobbies, or as having only one particular hobby, or as not having a hobby. In order to systematize reports the following check list of hobbies was presented for the teacher's use.

Hobbies

1. Reading—novels, mysteries, fanciful stories.
2. Reading—history, science, biography, etc.
3. Reading—funny papers, comics.
4. Active games or sports—football, tennis, riding, hiking, etc.
5. Quiet games—checkers, old maid, jacks, solitaire, etc.

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6. Playing musical instruments—not radio or phonograph.
7. Listening to radio, or phonograph.
8. Sewing, knitting, fancy work, etc.
9. Housework—Cooking, sweeping, straightening, etc.
10. Going to shows.
11. Dramatics—participating.
12. Playing make-believe games—teacher, mama and papa, store, church, etc.
13. Religious activity.
14. Building things, or shop work.
15. Traveling.
16. Driving car, riding in airplane.
17. Studying.
18. Working—farm, store, etc.
19. Clubs—social, dancing, etc.
20. Scouting, or other serious forms of club activity.
21. Collecting.
22. None.

Data from the original record sheets were transferred to Hollerith cards, and the following analyses and distributions were developed from Hollerith sortings. The intelligence quotient distributions were prepared for all children listed as having a given hobby. Naturally a child's *IQ* record may appear in two or more distributions, exclusive of the non-hobby distribution, because most children had from three to six recorded hobbies.

In Table 1 will be found a summary of the test data arranged by sexes and hobbies. The number of cases in each hobby group also are presented.

As one reviews this table one of the most clearly evident conditions is that of pronounced sex differences. As a matter of fact, the girls' *IQ* median is higher than the boys' for each of the 22 hobby groups. This consistency of girls' superiority may be due to an actual superiority of girls such as are included in this study. On the other hand, the female superiority may be a function of the test, and as such not significant with respect to the true basic aptitudes of the two sexes. In any event, it is worthy of note that at most points of comparison the obtained differences between the sexes are not sufficiently large to be statistically significant. This is especially true in the case of the non-hobby, sewing and fancy work, religious activity, housework, and dramatics groups where the critical ratio (taken off of probable errors) in each instance is less than 2.50.

TABLE 1
SUMMARY OF *IQ* DATA FOR CHILDREN OF EACH SEX WHO HAVE DESIGNATED HOBBIES

Hobby	<i>Med.</i>	Boys			<i>Med.</i>	Girls		
		<i>Q</i>	<i>PE_{md.}</i>	<i>N</i>		<i>Q</i>	<i>PE_{md.}</i>	<i>N</i>
1	101.77	8.83	.41	785	104.99	8.27	.34	998
2	104.19	8.87	.56	420	106.27	8.32	.55	374
3	100.69	9.14	.36	1075	103.71	8.78	.34	1103
4	99.71	9.46	.31	1502	103.87	8.57	.33	1077
5	100.97	8.79	.50	490	102.95	8.44	.44	607
6	102.91	8.51	.58	345	106.74	7.69	.44	510
7	100.18	8.95	.42	739	103.73	8.71	.39	820
8	101.74	8.95	1.28	78	103.45	8.67	.37	912
9	100.26	8.66	.81	181	102.32	8.50	.37	836
10	99.49	9.72	.46	779	103.45	8.69	.40	764
11	103.44	9.67	.98	149	106.44	9.92	.77	272
12	101.44	8.45	.78	184	105.15	8.56	.49	509
13	102.30	8.54	.77	194	104.11	8.66	.54	421
14	101.42	9.10	.43	755	105.00	7.71	1.02	90
15	103.33	8.97	.77	215	106.32	7.67	.66	222
16	96.40	9.10	.89	165	108.00	8.51	1.29	71
17	101.43	9.70	1.02	146	105.06	8.28	.69	238
18	98.13	10.38	.73	318	104.67	8.56	.91	142
19	98.27	7.40	.92	69	106.78	7.54	.75	166
20	101.12	8.38	.65	277	107.07	7.30	.58	251
21	104.65	9.32	.54	467	107.03	8.51	.55	386
22	97.00	10.33	1.04	122	97.91	9.69	1.25	110

In still other terms, it would appear that the girl with one of these hobbies is likely to be a little lower in tested intelligence, as compared with other girls in her group, than is the boy with such a hobby when compared with the other boys. This tendency appears to be especially pronounced in the case of non-hobby girls where the critical ratio of the differences is only .56. This forms an interesting contrast with the critical ratio of 11.37 for the difference between the medians of the total group of boys and total group of girls.

Just as surely as girls selecting certain hobbies tend to be lower in their group of girls than are boys who select these same hobbies, there are other hobby groups in which girls of relatively higher tested intelligence tend to participate more than in the case with boys. Thus, there is a mathematically significant difference, in favor of girls, between the *IQ* medians of boys and girls who read novels, funny papers, take part in active sports, play musical instruments, listen to the radio, go to the show, play make-believe games, drive a car, work, participate in social clubs, and do scouting. In

these instances it appears that the average boy who engages in one of the hobbies tends to be lower in tested intelligence when compared with the other boys, than is the girl participant when compared with other girls.

Another rather evident though related fact with respect to Table 1 is that there is considerable variation in hobby participations and *IQ* scores for the two sex groups. Thus, whereas the car driving group of girls has the highest median *IQ*, the same group of boys has the lowest median *IQ*.¹ This lack of concomitant *IQ* variation from one hobby group to another is seen in the low correlation of .36 between the medians for the two sexes. If one eliminates from consideration the non-hobby group of each sex this correlation is reduced still further. In fact, it becomes only .13 which, of course, means that the association between hobby participation and intelligence among boys is on an almost completely different basis from the association of these two variables among girls.

When one turns to an analysis of the intelligence test score most characteristic of children possessing each hobby, a study of Table 2 will reveal that children who possess certain hobbies tend to be of about average intelligence whereas those with other hobbies tend to deviate rather markedly. Thus, among boys, it will be noted that the average boy with either a fancy work, or a study hobby is neither significantly superior nor inferior in tested intelligence to the average boy in any other hobby groups. In other terms, in light of the sample population herein considered there is no reasonable basis for anticipating significant acceleration or retardation in tested intelligence on the part of a boy with either one of these hobbies. Except when compared with the non-hobby group, the same statement can be made with respect to girls who have either shop work or study as their hobby. Incidentally, it probably is of more than passing interest to note that both among boys and girls the child with a primary study interest is not found to be exceptionally bright, on the average. To the contrary this hobby interest appears as an attribute of mediocrity about as frequently as a characteristic either of superiority or inferiority. This statement is substantiated still further by an analysis of Table 4.

Table 3 is compiled from Table 2. In Table 3 one finds a sum-

¹In this particular instance it probably is worthy of note that only 71 girls as opposed to 165 boys have this hobby.

TABLE 2
 CRITICAL RATIOS OF DIFFERENCES BETWEEN MEDIAN IQ'S FOR CHILDREN HAVING SPECIFIED HOBBIES
 Boys' Data in Lower Left, and Girls' Data in Upper Right Portions of Table.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1		+	—	—	—	+	—	—	—	—	+	+	—	+	+	+	+	—	+	+	+	—
		1.98	2.65	2.36	3.66	3.14	2.43	3.06	5.31	2.93	1.72	.27	6.31	.01	1.79	2.26	.09	.33	2.14	3.09	3.15	5.46
2	—		—	—	—	+	—	—	—	—	+	—	—	+	+	—	—	—	+	+	+	—
	3.49		3.95	3.74	4.71	.67	3.77	4.25	5.96	4.14	.18	1.52	2.83	1.09	.06	1.23	1.37	1.51	.66	1.00	.98	6.12
3	+	+		+	—	+	—	—	—	—	+	+	+	+	+	+	+	+	+	+	+	—
	2.00	5.27		.34	1.36	5.43	.04	.52	2.76	.49	3.24	2.41	.63	1.19	3.51	3.19	1.75	.99	3.68	4.98	5.13	4.48
4	+	+	+	—	—	+	—	—	—	—	+	+	+	+	+	+	+	+	+	+	+	—
	4.01	6.79	2.04		1.67	5.22	.27	.85	3.12	.81	3.07	2.17	3.84	1.05	3.32	3.14	1.56	.83	3.56	4.79	5.93	4.61
5	—	+	—	—	—	+	+	+	—	+	+	+	+	+	+	+	+	+	+	+	+	—
	1.24	4.28	.47	2.14		6.10	1.33	.87	1.10	.84	3.94	3.34	1.68	1.85	4.25	3.71	2.59	1.70	4.30	5.64	5.79	3.81
6	+	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	1.61	1.59	3.27	4.87	2.53		5.12	5.72	7.58	5.53	.34	2.42	3.81	1.57	.53	.92	2.06	.03	.05	.45	.41	6.66
7	+	+	+	—	+	+	—	—	—	—	+	+	+	+	+	+	+	+	+	+	+	—
	2.71	5.73	.90	.90	1.19	3.81		.52	2.62	.50	3.14	2.27	.58	1.16	3.38	3.17	1.68	.95	3.61	4.78	4.89	4.44
8	+	+	—	—	—	+	—	—	—	—	+	+	+	+	+	+	+	+	+	+	+	—
	.02	1.75	.80	1.54	.56	.83	1.16		2.16	.00	3.51	2.77	1.02	1.47	3.79	3.39	2.06	1.24	3.98	5.26	5.27	4.26
9	+	+	+	—	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	—
	1.62	3.89	.47	.63	.77	2.66	.09	.98		2.07	4.82	4.60	2.77	2.54	5.28	4.23	3.50	2.40	5.33	6.91	7.08	3.39
10	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	—
	3.70	6.02	2.04	.40	2.17	4.63	1.11	1.65	.83		3.45	2.69	.99	1.48	3.72	3.36	2.02	1.23	3.92	5.13	5.26	4.22
11	—	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	1.57	.66	2.64	3.63	2.24	.46	3.06	1.05	2.50	3.65		1.41	2.49	1.13	.12	1.04	1.33	1.49	.22	.65	.62	5.81
12.	+	+	—	—	—	+	—	+	—	+	+	—	—	—	+	+	—	—	—	+	+	—
	.38	2.87	.89	2.06	.51	1.51	1.42	.20	1.05	2.05	1.60		1.44	.13	1.42	2.06	.11	.46	1.82	2.53	2.55	6.14

TABLE 2 (continued)

	— 1	+ 2	— 3	— 4	— 5	+ 6	— 7	— 8	— 9	— 10	+ 11	— 12	13	+ 14	+ 15	+ 16	+ 17	+ 18	+ 19	+ 20	+ 21	— 22
13	.65	1.97	1.91	3.12	1.45	.63	2.42	.38	1.82	3.14	.91	.78		.77	2.61	2.39	1.09	.53	2.91	3.73	3.82	4.57
14	+	+	—	—	—	+	—	+	—	—	+	+	+		+	+	+	—	+	+	+	—
15	.59	3.91	1.32	3.23	.68	2.06	2.06	.24	1.27	3.07	1.89	.02	1.01		1.09	1.82	.05	.24	1.40	1.76	1.75	4.39
16	—	+	—	—	—	—	—	—	—	—	+	—	—	—		+	—	—	+	+	+	—
17	1.79	.90	3.12	4.37	2.57	.43	3.59	1.07	2.74	4.29	.09	1.72	.95	2.17		1.16	1.32	1.47	.46	.85	.83	5.95
18	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		—	—	—	—	—	—
19	5.48	7.41	4.46	3.51	4.47	6.14	3.84	3.42	3.21	3.09	5.29	4.25	5.02	5.07	5.89		6.35	6.68	2.58	.66	.69	5.57
20	+	+	—	—	—	+	—	+	—	—	+	+	+	+	+	—	—	—	+	+	+	—
21	.31	2.37	.69	1.61	.40	1.26	1.13	.19	.90	1.73	1.42	.01	.68	.01	1.49	3.71		3.41	1.69	2.23	2.23	5.04
22	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	—
18	4.34	6.59	3.13	1.99	3.10	5.12	2.44	2.45	1.95	1.58	4.35	3.09	3.93	3.89	4.90	1.50	2.63		1.79	2.22	2.03	5.73
19	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	—	—	—	—	+	+	—
20	3.47	5.50	2.44	1.48	2.48	4.26	1.89	2.20	1.63	1.19	3.84	2.63	3.36	3.11	4.22	1.46	2.30	.12		.31	.27	6.08
21	+	+	—	—	—	+	—	+	—	—	+	+	+	+	+	—	—	—	—	—	—	—
22	.84	3.58	.59	1.96	.18	2.06	1.22	.43	.83	2.05	1.97	.32	1.17	.39	2.19	4.28	.26	3.06	2.53		.05	6.65
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24	4.25	.59	6.10	7.93	4.99	2.20	6.53	2.10	4.51	7.91	1.08	3.38	2.50	4.68	1.40	7.92	2.79	7.18	5.99	4.18		6.66
25	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
26	4.26	6.08	3.34	2.50	3.44	4.97	2.55	2.87	2.47	2.19	4.51	3.42	4.09	3.92	4.89	.44	3.04	.68	.91	3.35	6.52	

*A + indicates that the median *IQ* of the hobby group whose number appears at the top of the column is greater than the median *IQ* of the hobby group whose number appears at the left of the row. A — indicates the reverse. Thus, among boys, the median *IQ* of hobby group No. 1 is less than the median *IQ* of hobby group No. 2, and the critical ratio of the difference is 3.49. Similarly, among girls, the median *IQ* of hobby group No. 2 is more than the median *IQ* of hobby group No. 1, and the critical ratio of the difference is 1.98.

TABLE 3
SUMMARY, FOR EACH SEX, COMPILED FROM TABLE 2, SHOWING ALL INSTANCES OF SIGNIFICANT DIFFERENCES (*i.e.*, $CR=3.85$) BETWEEN MEDIAN *IQ*'S OF CHILDREN IN VARIOUS HOBBY GROUPS*

Hobby	Boys		Hobby	Girls	
	Surpasses	Is surpassed by		Surpasses	Is surpassed by
1	4, 16, 18, 22	21	1	9, 13, 22	
2	3, 4, 5, 7, 9, 10, 14, 16, 18, 19, 22		2	3, 5, 8, 9, 10, 22	
3	16	2, 21	3	22	2, 6, 20, 21
4		1, 2, 6, 15, 21	4	22	6, 20, 21
5	16	2, 21	5		2, 6, 11, 15, 19, 20, 21
6	4, 10, 16, 18, 19, 22		6	3, 4, 5, 7, 8, 9, 10, 22	
7		2, 21	7	22	6, 20, 21
8			8	22	2, 6, 19, 20, 21
9		2, 21	9		1, 2, 6, 11, 12, 15, 16, 19, 20, 21
10		2, 6, 15, 21			2, 6, 19, 20, 21
11	16, 18, 22		10	22	
12	16		11	5, 9, 22	
13	16, 18, 22		12	9, 22	
14	16, 18, 22	2, 21	13	22	1
15	4, 10, 16, 18, 19, 22		14	22	
16		1, 2, 3, 5, 6, 11, 12, 13, 14, 15, 20, 21	15	5, 9, 22	
17			16	9, 17, 18, 22	
18		1, 2, 6, 11, 13, 14, 15, 21	17	22	16
19		2, 6, 15, 21	18	22	16
20	16	21	19	5, 8, 9, 10, 22	
			20	3, 4, 5, 7, 8, 9, 10, 22	
21	1, 3, 4, 5, 7, 9, 10, 14, 16, 18, 19, 20, 22	1, 2, 6, 11, 13, 14, 15, 21	21	3, 4, 5, 7, 8, 9, 10, 22	1, 2, 3, 4, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21

*In order to read this table look at Hobby 1 for boys. Here we find that the median *IQ* for boys with this hobby is significantly higher than the median *IQ* of boys who participate in Hobbies 4, 16, 18, and 22, but, in turn, is significantly lower than the median *IQ* of boys with Hobby 21.

mary of the relative superiority and inferiority, to the extent of mathematical significance,² in intelligence of those in each hobby group as compared with those in all other hobby groups. Thus, it can be noted that boys with hobby No. 1, reading novels, mysteries, and the like, tend to be significantly superior in tested intelligence, on the average, to boys whose hobbies are either active games or sports, or driving a car, or working, or to boys who have no hobby. On the other hand, these novel reading boys, on the average, tend to be significantly lower in tested intelligence than boys in the collecting hobby group. Girls with this reading hobby, however, tend to be significantly superior, on the average, to girls in the housework, religious activity, and non-hobby groups, and are not surpassed to a significant extent by those having any other hobby.

A continued analysis of Tables 2 and 3 reveals the fact that among boys the hobbies whose participants are most frequently significantly superior in tested intelligence to those in other hobby groups are: first, collecting, which surpasses any other group; second, reading history, science, biography, and so forth, the members of which group, on the average, surpass 11 other hobby groups; third, and fourth, playing musical instruments, and traveling; fifth, reading novels; and sixth and seventh, participating in dramatics, and religious activity. Among girls, the hobbies most likely to be associated significantly with intelligence superiority are: first, second, and third, playing musical instruments, and collecting, and scouting or other forms of serious club activity; fourth, reading history, science, biography, and the like; fifth, social clubs, dancing, and so forth; sixth, driving a car.

Rather interestingly, among girls no one hobby dominates the field as completely as does collecting among boys. At the same time, the average *IQ* of girls without a hobby is surpassed by the averages of 19 other hobby groups, and this pronounced inferiority in median intelligence is not found for any of the boys' groups. Among boys, the car driving group is surpassed significantly in median *IQ* by 12 other hobby groups. Practically the same condition is met among girls who indicated a housework hobby. Their *IQ* average is significantly lower than that of 10 other groups and significantly superior to none.

In Table 4 a still different approach is seen to the problem. In

²This is taken to be indicated by a *CR* of 3.85 or above.

TABLE 4
PER CENT OF CHILDREN, EACH SEX, IN BOTH HIGH AND LOW INTELLIGENCE
GROUPS WHO PARTICIPATE IN DESIGNATED HOBBIES, TOGETHER WITH
GROUP DIFFERENCES AND CRITICAL RATIOS

	Boys				Girls			
	High IQ	Low IQ	Diff.	CR	High IQ	Low IQ	Diff.	CR
1	.47	.26	.21	10.01	.46	.31	.15	7.06
2	.31	.10	.21	8.53	.19	.09	.10	6.80
3	.51	.42	.09	4.09	.46	.43	.03	1.36
4	.69	.65	.04	1.91	.47	.41	.06	2.73
5	.25	.19	.06	3.24	.24	.28	-.04	2.03
6	.21	.11	.10	1.21	.30	.12	.18	10.55
7	.33	.31	.02	.96	.35	.34	.01	.47
8	.06	.02	.04	4.39	.38	.39	-.01	.47
9	.08	.08	—	—	.32	.38	-.06	2.81
10	.33	.37	-.04	1.89	.31	.32	-.01	.48
11	.10	.05	.05	4.14	.15	.06	.09	6.92
12	.09	.07	.02	1.63	.26	.17	.09	5.01
13	.16	.12	.04	2.56	.19	.17	.02	1.18
14	.39	.29	.10	4.76	.04	.04	—	—
15	.14	.07	.07	5.02	.12	.06	.06	4.86
16	.06	.08	-.02	1.77	.05	.03	.02	2.27
17	.08	.06	.02	1.73	.11	.09	.02	1.52
18	.13	.17	-.04	2.53	.07	.05	.02	1.89
19	.03	.02	.01	1.40	.10	.07	.03	2.42
20	.12	.10	.02	1.42	.16	.06	.10	7.58
21	.34	.11	.23	12.64	.24	.10	.14	8.82
22	.02	.05	-.03	3.47	.03	.09	-.06	5.35

this instance children whose intelligence quotients are 110 or above are segregated and their hobby participations analyzed, whereas the same procedure is carried out for those whose intelligence quotients are under 90. When these bright and dull groups, for each sex, are compared one finds some very striking facts. First, of course, it will be noticed that bright children equal or excel dull children in frequency of hobby participations in all but three of the 21 hobby groups of boys, and all but four of the 21 girls' groups. In fact, the average bright boy has 4.87 hobbies compared to 3.63 for the dull boy, and the average bright girl has 4.98 hobbies as compared with 3.94 participated in by the average dull girl.

When one picks out the activities in which the bright boy tends to participate significantly more frequently than the distinctly dull boy, we note: (a) collecting, (b) reading novels, mysteries, and so forth; (c) reading history, science, biography, (d) traveling; (e) building things or shop work; (f) sewing, fancy work; (g) drama-

tics; and (*h*) reading the funny paper. In turn, really superior girls participate with significantly greater frequency than inferior girls in: (*a*) playing musical instruments; (*b*) collecting; (*c*) scouting and serious club activity; (*d*) reading novels, mysteries, and so forth; (*e*) dramatics; (*f*) reading history, science, biography; (*g*) playing make-believe games; and (*h*) traveling. In no instance do inferior boys exceed superior ones to a significant degree, and only in the case of no hobby participations do inferior girls exceed in frequency intellectually superior ones.

In light of the data presented in the foregoing analyses the following appear to be valid conclusions from this study:

1. Some hobbies tend to be participated in more frequently by children of high tested intelligence than do other hobbies.

2. Pronounced sex differences in the intelligence-hobby relationship exist. In fact, one has only a very meagre basis for anticipating the type of intelligence which will be associated with hobby participation in one sex group from a knowledge of the nature of this relationship in the other sex group.

3. When both sex groups are considered together the hobbies of collecting, playing musical instruments, and reading history, science, biography, and the like appear most likely to be participated in by those of superior intellectual ability.

4. No single hobby appears to be associated consistently with children of lower than average intelligence as are the three hobbies just mentioned associated with those of above average intelligence.

5. Very superior children appear to have a greater diversification of hobby interests than very inferior ones.

6. Very superior children tend to engage in certain types of hobby activities much more frequently than very inferior ones. Furthermore, they do not participate with significantly less frequency in any type of hobby than do very inferior children.

7. The child without a hobby is more likely to be below average in intelligence than is the child with hobbies. This is particularly true with respect to girls.

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