THE KENT AND OTHER TESTS USED ON THE SAME SUBJECTS.

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TESTS of the indefinable quality known as intelligence are legion. Many have been standardized satisfactorily, others have not. The validity of some tests is high, but results of different tests used on the same individuals have seldom been published.

The Kent Emergency Test, although standardized on average American children, is, to quote its author, "framed expressly for adult subjects." Consequently, it can be used on children or adults. In this investigation it has been used on both. The Stanford-Binet was standardized on children and has been used on them only. The F.H.3 (or R) for adults has been used on adults only, and the Progressive Matrices, standardized by Raven on children and adults, has also been used on adults only.

MATERIAL.

In these investigations the subjects, to a total of 1,566, were examined as follows:

(*a*) 557 subjects, each tested with the Kent and the Stanford-Binet tests.

(*b*) 409 subjects, each tested with the Kent and Part I of the Farmer-Hotoph 3 (or R) given as a group test.

(*c*) 600 subjects, each tested with the Kent and the Progressive Matrices given as a group test.

The Matrices tests were conducted by the Testers of the D.S.P. The F.H.3 (or R) tests were conducted by officers of the Army Education Corps. As regards the military cases, the Kent tests and many Matrices tests were performed by the writer.

Charts I and II show that the Kent, Binet and Matrices gave normal curves in populations (a) and (c).

RESULTS.

(a) *Kent Emergency and Stanford-Binet.* (Table VII.)

The Binet test and Earl's English modification of the Kent test (Rudolf) were given on the same day to each testee. Consequently, growth and temporary slight illness, e.g., headache, coryza, etc., would be unlikely to affect the results obtained on one test more than those obtained on the other. Both tests were given as individual tests, by the same tester, to all the testees. Both sexes were tested. The ages varied from $9\frac{5}{12}$ to 54 years, and the number examined was 557. All had been diagnosed as mental defectives before the tests were applied.

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CHART I.

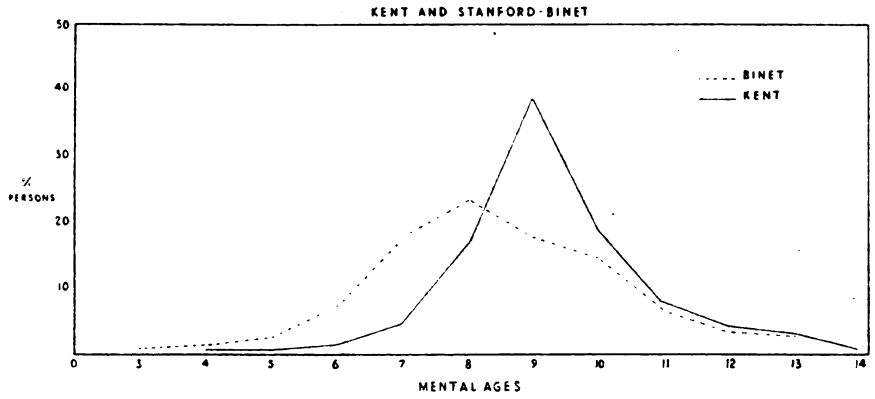
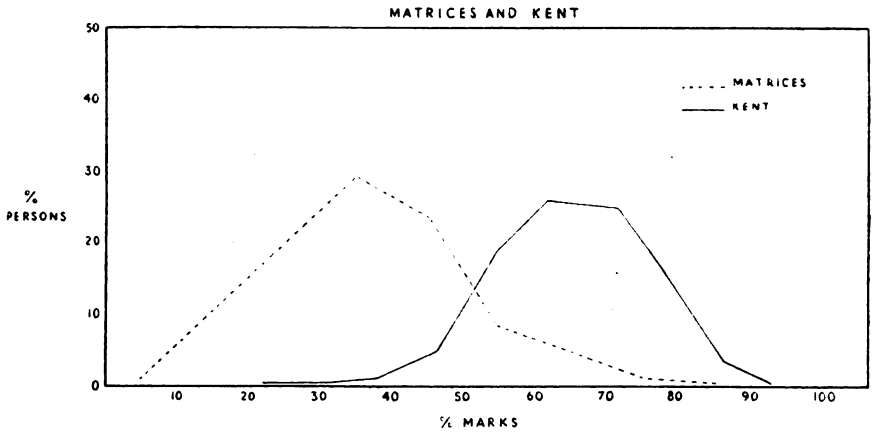


CHART II.



McIntyre and Hoffeditz compared the two tests on American feeble-minded individuals. The results of their investigations and of the present one on English subjects are shown in Table I.

TABLE I.—*Comparisons of Kent with Binet (Stanford).*

Number in series.	Chron. age (yrs.).	Mental age (Binet).	Mental age (Kent).	Mean Kent above mean Binet.	Kent > Binet %.	Kent = Binet %.	Kent < Binet %.	Author
(1) 161	5–30+	3–14	5–14	·81	74	6	20	McIntyre and Hoffeditz
(2) 557	$9\frac{5}{12}$–54	3–16	5–14	·63	61·1	24·7	14·1	Present

This table shows that, in both investigations, the Kent records higher than the Stanford Revision in 60–75 per cent. of cases, but that in any individual it is impossible to foretell whether he will score higher or lower, as up to 1 in 5 may score lower on the Kent than on the Binet. The distribution of the cases is seen in Table VII.

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(b) *Kent with F.H.3 (or R) Part I.* (Table VIII.)

The F.H.3 (or R) was given in groups, the Kent individually. Each subject was given the two tests, all the Kent tests being given by one tester. The subjects were adults of the male sex, a total of 409 being examined. The men were serving soldiers. The percentages obtained in Part I of the F.H.3 (or R) were compared with the percentages scored in the Kent Test. In the latter the percentages were calculated for the lower and middle scales on the maximum obtainable on the middle scale. Thus, the lower scale was regarded as a part of the middle scale. This is fair, since those of the lower intelligence are tested on the lower scale because they cannot reach the upper parts of the middle scale, and the marks for similar mental ages on the lower and middle scales are almost identical. With the upper scale the percentages were calculated on the maximum marks obtainable on this scale. The marks obtainable on this scale and on the middle scale are very dissimilar for identical mental ages. Table II shows the results obtained. Differences are considerable.

TABLE II.—*Marks Obtained by Same Testees on Kent and F.H.3 (or R).*

Subjects obtaining the marks.	Marks (per cent.) obtained—	
	On Kent.	On F.H.3 (or R).
169	58–74	3–11

All, with the exception of one man, scored less than 35 per cent. on F.H.3 (or R) test, but only three men scored less than 34 per cent. on Kent's Scale.

(c) *Kent with Progressive Matrices.* (Table IX.)

The same subjects were tested with both tests. The Kent was given by one tester to all subjects, who were male adults only. The Matrices was given as a group test, and by numerous testers. A total of 600 men was tested. All were serving soldiers. The percentage marks obtained in the two tests were compared, the method of calculating those in Kent's test being as in the Kent-F.H.3 (R) (Table II).

The differences are less than is the case with the F.H.3 (or R) test as shown in Table III :

TABLE III.—*Marks Obtained by Same Testees on Kent and Matrices.*

Subjects obtaining the marks.	Marks (per cent.) obtained—	
	On Kent.	On Matrices.
229	66–81	11–61

DISCUSSION.

The results of these examinations show that individuals tend to score higher on Kent's test than on the Stanford-Binet, on Kent's than on F.H.3 (or R), and on Kent's than on the Progressive Matrices. As the same testees score differently on the tests, the tests may be testing different properties,

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may be standardized incorrectly, or the allotting of marks may be on different principles. It is clear, however, that the Kent test gives higher results than the others, whatever the reason may be. (Table VII)

The giving of a test as a group or an individual test is of importance. This is especially so in the case of the Progressive Matrices, in which the marks for the individual test worked out on 660 children are lower than those for the group test, worked out on 1,407 children (Raven). The differences of the median scores of the group test and of the individual tests are shown in the following table, in each case the median for the group test being higher than that for the individual :

TABLE IV.—*Differences of Matrix Median (Group and Individual).*

C.A.	8	8½	9	9½	10	10½	11	11½	12	12½	13	13½
Diff.	2	5	6	10	6	9	8	8	5	6	6	6

The difference between the 95 percentile points and the 5 percentile points respectively are shown in Table V in marks obtained in this test. Again, in each case, the differences are positive in favour of the group test, except at year 13 in the 95 percentiles, and at years 9½ and 10 in the 5 percentiles.

TABLE V.—*Differences of the Group and Individual Matrices.*

C.A.	8	8½	9	9½	10	10½	11	11½	12	12½	13	13½
95 percentile	12	4	4	6	7	7	2	3	2	0	—1	0
5 percentile	0	1	0	—1	—1	0	1	2	1	3	1	3

In the lowest 5 per cent. of individuals from 8 to 11 years C.A., it is apparently immaterial whether the test is given as a group test, or individually. The same situation is true for the highest 5 per cent., with ages of from 12½ to 13½ years. The remaining differences fall between these two extremes of the lowest 5 per cent. of individuals at the lowest chronological ages and the highest 5 per cent. at the highest chronological ages.

If the mental ages are to be utilized for comparison with other tests, it is therefore necessary to know whether the test was given as a group, or as an individual test. Whatever the results given by a test, it is clear that the children themselves possess the same quantity of intelligence at the various C.A., although the same test, used differently, gives varying results. It follows that either the individual method, the group method, or even both methods, are inaccurate for recording intelligence alone.

The scores obtained on the Matrices Group Test have been placed by Raven in Grades (see Table VI), for adults.

For the purposes of comparison the use of the gradings (see Table VI) is unsatisfactory. A subject at the lower limit of one grade will be grouped in a grade different to that of a subject at the upper limit of the next lower grade, although separated by only one mark. A subject at the top of one grade may be as

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TABLE VI.—*Matrices Grades* (*Raven*).

Grade I	55 and over
Grade II	49–54
Grade III plus . . .	44–48
Grade III minus . . .	29–43
Grade IV	24–28
Grade V	Up to 23

much as 23 marks from a subject at the bottom of the same grade, although both are grouped together. If the grade in which a subject falls is used, comparisons will therefore be unreliable.

As the mental ages read from the median differ according to whether the Matrices test is given as a group or as an individual test, there being up to 1½ years' M.A. difference with the same median score, and as the same score can be recorded, in the individual test, on any mental age extending over a period of 1½ years, e.g, 16 marks can give from 7 to 8½ years' M.A., it is clear that the use of the mental ages for comparison is not reliable.

In consequence the marks obtained have been used. As pointed out by Raven, the standard series does not differentiate clearly between individuals within the groups.

The tests under consideration are so constructed that the so-called normal or average individual is unable to obtain full marks. The maximum mark obtainable in each test is not, however, the same. In the Kent test it is 42, 49 and 54 for the three scales, in the F.H.3 (R) test (Part I) it is 62, and in Raven's Matrices Test it is 60. In the comparison of the Kent Tests with the F.H.3 (R) or Raven's, it will therefore be necessary to determine how far the testee has been able to progress in each test. A simple plan is to calculate

TABLE VII.—*Kent and Stanford-Binet.*

Kent M.A.	Binet M. A. 3—	4—	5—	6—	7—	8—	9—	10—	11—	12—	13—	14	Kent totals.
4—.	1												1
5—.		1		1									2
6—.		2	3	0	2	1							8
7—.		2	3	13	9	2							29
8—.			6	21	35	26	9	1					98
9—.				6	52	81	49	25	7	1	1		222
10—.				1	2	20	35	34	7	6	2		107
11—.					1	2	7	17	11	6	2		46
12—.						1	1	4	9	5	5		25
13—.							1	4	4	3	4		16
14 .									2		1		3
Binet totals .	1	5	12	42	101	133	102	85	40	21	15	0	557

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the percentage of the total marks he has obtained and compare these percentages. This plan has therefore been followed. (Tables VIII, IX.)

TABLE VIII.—*Kent with F.H.3 (R).*

Kent percentage marks.	F.H.3 (R) Percentage marks. 1—	5—	9—	13	17—	21—	25—	29—	33—	35	Kent totals.
26—	1	1			1						3
34—	0	2	2		0						4
42—	9	8	6	1	0	2					26
50—	22	26	21	2	3	0	1				75
58—	36	44	34	4	3	5	1	2	1		130
66—	22	32	31	3	3	4	5	1	1		102
74—	9	12	20	5	2	4	1	2	4	1	60
82—	3		2	1		1		1	1		9
90											
F.H.3 (R) totals	102	125	116	16	12	16	8	6	7	1	409

TABLE IX.—*Kent with Group Matrices (all Cases).*

Kent percentage marks.	Matrices percentage marks. 1—	11—	21—	31—	41—	51—	—61	71—	81	Kent totals.
18—		2								2
26—		0	1	2						3
34—		3	2	1	1	1				8
42—	1	8	9	10	5	1				34
50—	1	11	29	37	26	8		1	1	114
58—	1	20	34	50	39	10	4	1	1	160
66—	3	14	26	47	40	13	9	1	1	154
74—		7	13	22	32	15	7	5		101
82—			4	5	4	2	7	1		23
90				1						1
Matrices totals	6	65	118	175	147	50	27	9	3	600

Correlation coefficients have been kindly worked out by Prof. M. Greenwood from the tables. These are as below :

		Number of obs.		
Table VII	Kent and Stanford-Binet	557	+0·7499	±0·019
,, VIII	Kent with F.H.3 (R) (group)	409	+0·0893	±0·049
,, IX	Kent with Group Matrix (all cases)	600	+0·2686	±0·038

The Kent and the Stanford-Binet tests show a fairly high correlation; the others, low.

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Conclusions.

The Kent Emergency Test cannot be used as an alternative to the Stanford-Binet, the Progressive Matrices, or the F.H.3 (or R) test, as it does not record similar results on the same individuals.

In conclusion, especial thanks are due to Prof. M. Greenwood, F.R.S., for his advice and the calculations of the correlation co-efficients.

Thanks are due to Dr. J. Lyons, Medical Superintendent of Hortham Colony, Bristol, for permission to quote the cases from that colony.

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