

A Rapid Screening Psychometric Test

Evaluation of the Kent Emergency Scale

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WHEN a child exhibits behavioral, educational or psychologic problems, an appraisal of his intelligence becomes an integral part of the diagnostic survey. The need for an effective screening device for mental age is emphasized by the finding that pediatricians' clinical estimates are often inaccurate.^{1, 2}

There are several screening tests which could be used by pediatricians (Ammon, Kent, Peabody, Goodenough, etc.).^{3, 10} The validity of the Ammon Quick Test as a screening device for mental age has been shown both in the psychologic literature^{11, 12} and in the pediatric literature.³ The usefulness of the Kent Emergency Scale⁴ as a screening device for mental age has been reported in the psychologic literature;¹³⁻²⁰ however, its usefulness in the hands of pediatricians has not been studied previously.

This report describes an evaluation of the validity of the Kent Emergency Scale as used by pediatricians in an outpatient unit.

Testing Methods

Six intelligence tests were used in this comparative study. Four of them—Stanford-Binet, Leiter, Weschler, Weschler Intelligence Scale for Children—are formal psychometric tests

which must be administered by clinical psychologists. The other two—the Kent Emergency Scale^{***} and the Ammon Quick Test[†]—are screening tests which can be utilized by practicing pediatricians. The applicability of the Ammon Quick Test in pediatrics has been reported by Press *et al.*³

The four above mentioned formal psychometric tests and the Ammon Quick Test were used in this work to measure the validity of the Kent Scale as a tool in the hands of pediatricians.

The Kent Emergency Scale is administered orally by asking sets of questions which are graded according to the patient's age.⁴ There are four subsidiary scales: A, B, C, D. Scale A consists of 25 questions and covers mental ages from five to seven years. Scale B consists of 30 questions and covers mental ages from six to eight years. Scale C consists of 27 questions and covers mental ages from six and one-half to 11 years. Scale D consists of ten questions and covers mental ages from eight to 14+ years. By answering the questions, the patient obtains a raw score which is then converted to mental age by standardized tables provided with the test.⁴⁻⁷ Representative questions of the Kent Emergency Scale are reproduced in Table 2.

The Ammon Quick Test (used here for comparison) asks the patient to indicate, by pointing, which of the four drawings on three printed cards best illustrates the meaning of

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*** The Kent Emergency Scale can be obtained from The Psychological Corporation, 304 East 45th Street, New York, N. Y. 10017.

† The Ammon Quick Test can be obtained from The Psychological Test Specialists, Box 1441, Missoula, Montana 59801.

A RAPID SCREENING PSYCHOMETRIC TEST

a given word. The words are read by the tester from standardized lists graded in order of increasing difficulty. Testing with a given list continues until the patient has had six consecutive failures. The total number of correct responses yields a raw score which is then converted to a mental age by standardized tables provided.⁸

To investigate the reliability of the Kent Emergency Scale the following experiment was designed. Eighty patients (ages six to 18 years) who required psychologic testing were selected. These patients were split into two groups of 40 each. Patients in group A were tested by either of two pediatricians (F. J. dC. or K. L. V.) with the Kent Emergency Scale, and by one of four clinical psychologists using a Weschler, a Stanford-Binet or a Leiter Test. Patients in group B were tested by one pediatrician (F. J. dC.) who used both the Ammon Quick Test and the Kent Emergency Scale. The readings for mental age obtained by either the Kent Emergency Scale or the Ammon Quick Test were converted into I.Q. by dividing each of these mental ages by its respective chronologic age and multiplying by 100.

Results

In group A, the mean I.Q. obtained by the pediatricians was 82 ± 15.3 (\pm S.D.); by the psychologists, 83 ± 15.4 (\pm S.D.). The distri-

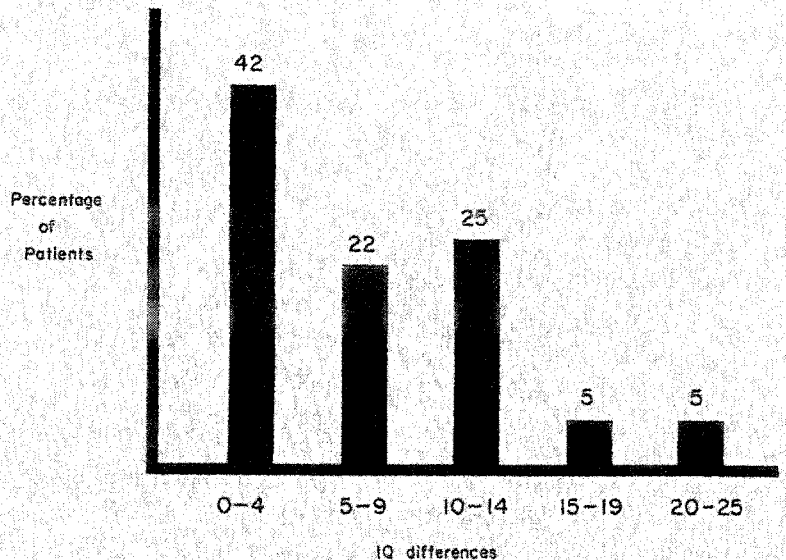
TABLE 1. *Distribution of I.Q. in Groups A and B*

I.Q.	Group A		Group B	
	Kent	Psychol. Results	Kent	Ammon
Below 50	1 (2.5%)	1 (2.5%)	0	0
50-59	2 (5.0%)	2 (5.0%)	0	0
60-69	5 (12.5%)	4 (4.0%)	3 (7.5%)	1 (2.5%)
70-79	9 (22.5%)	7 (17.5%)	6 (15.0%)	9 (22.5%)
80-89	10 (25.0%)	12 (30.0%)	10 (25.0%)	7 (17.5%)
90-110	13 (32.5%)	14 (35.0%)	20 (50.0%)	21 (5.2%)
Above 110	0	0	1 (2.5%)	2 (5.0%)
TOTAL	40	40	40	40

TABLE 2. *Representative Questions of the Kent Emergency Scale*

- Scale A: Which is larger, a cow or a sheep?
 Scale B: Tell me a bird that can swim.
 Scale C: What do we call a tadpole after it grows up?
 Scale D: If a flag floats to the South, from what direction is the wind?

FIG. 1. I.Q. differences between Kent and psychologist results in group A.



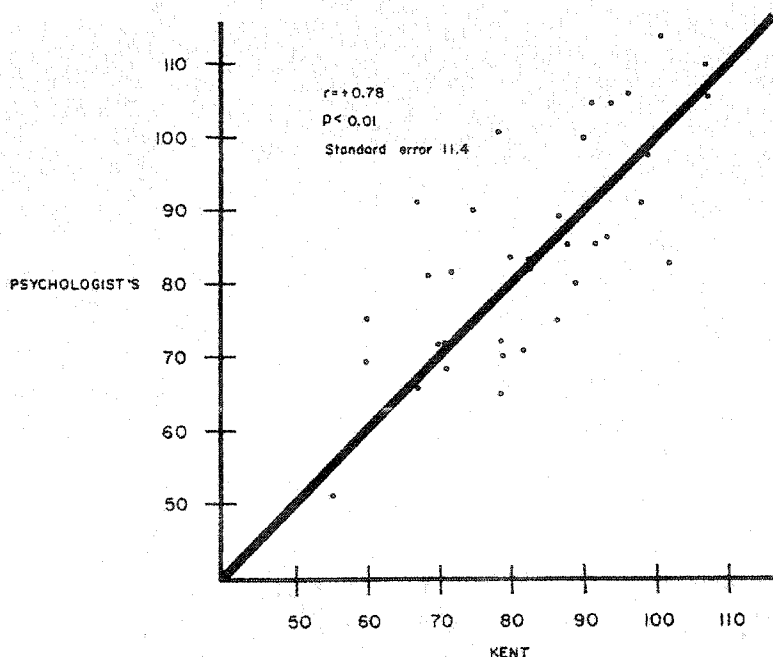


FIG. 2. Relationship between I.Q. scores obtained by Kent test and by psychologist's evaluation.

bution of the readings is shown in Table 1. The differences between pediatricians' results and psychologists' results were 0 to 4 I.Q. units in 42 per cent of the patients; 5 to 9 I.Q. units in 22 per cent; 10 to 14 I.Q. units in 25 per cent; 15 to 19 I.Q. units in 5 per cent; 20 to 25 I.Q. units in 5 per cent (Fig. 1).

The standard error of the estimate was 11.4 I.Q. units and the correlation coefficient was $+0.73$ ($p < 0.01$)⁹ (Fig. 2).

In group B, the mean I.Q. obtained by the Kent Emergency Scale was 89 and by the Ammon Quick Test 90. The distribution of the I.Q. readings can be seen in Table 1. The

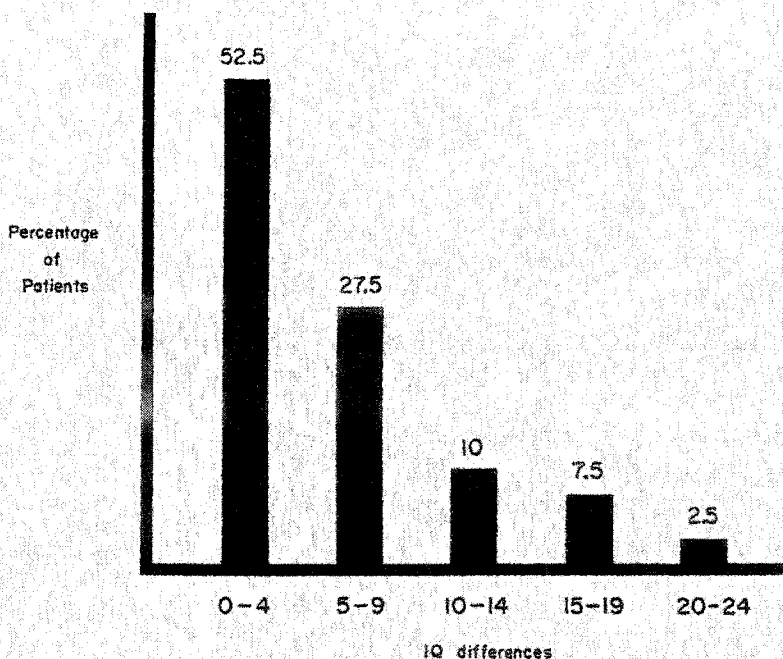


FIG. 3. I.Q. differences between Kent and Ammon tests in group B.

A RAPID SCREENING PSYCHOMETRIC TEST

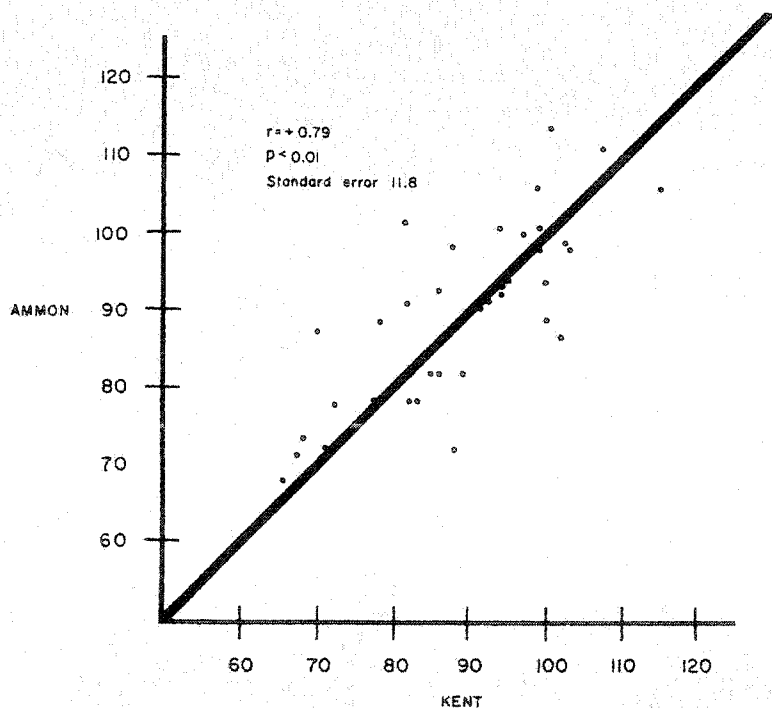


FIG. 4. Relationship between I.Q. obtained by Kent and Ammon tests.

difference between I.Q.'s obtained by each one of these two tests were: 0 to 4 I.Q. units in 52.5 per cent of the patients; 5 to 9 I.Q. units in 27.5 per cent; 10 to 14 I.Q. units in 10 per cent; 15 to 19 units in 7.5 per cent; 20 to 24 units in 2.5 per cent (Fig. 3). The standard error of the estimate was 11.8 units and the correlation coefficient $+0.75$ ($p < 0.01$)⁹ (Fig. 4).

Discussion

For appraisal of intelligence the formal psychometric tests (Leiter, Stanford-Binet, Weschler, etc.) require special training in psychology, are time consuming, and require the services of a trained psychologist. The need for a rapid reliable test for mental age which can be performed by a pediatrician is clearly obvious.

When we compare the Kent Scale with the Ammon Test from the standpoint of ease of administration, we found that the Kent Scale was a few minutes faster to administer than the Ammon Test. Although the Ammon Test has a wider age range than the Kent Scale (one and one-half years to adult versus five to 14+ years), the Kent Scale offers the advantage of employing simple equipment and of

not requiring, as does the Ammon, the use of fairly large cards with pictures.

When we compared I.Q.'s obtained by the Kent Scale with those obtained by Ammon Tests and by formal psychometric tests, the differences were small. Only 10 per cent of the patients showed I.Q. differences of 15 or more I.Q. units, and 90 per cent showed differences of 14 or less (Figs. 1 and 2).

One should be cautious in accepting I.Q. values obtained by screening tests because an error of a few points might be crucial for a specific patient.²¹ But in the normal range of intelligence 14 or less I.Q. units difference is not at all a high figure. Since our results suggest that the Kent Emergency Scale tends to underestimate rather than overestimate I.Q., it could be assumed that children found functioning within the normal range of intelligence by the Kent test are likely to be found within this range when tested by formal psychometric tests.

The calculated correlation coefficient of $+0.78$ when the Kent Scale results (obtained by pediatricians) are compared with results obtained by clinical psychologists, and of $+0.79$ when Kent Scale results and Ammon Quick Test results are compared, are statis-

tically significant ($p < 0.01$). These correlation coefficients of +0.78 to +0.79 are even more significant if we realize that correlation coefficients ranging from +0.69 to +0.93 have been reported in comparing Leiter Scale with Stanford-Binet and correlation coefficients of +0.77 to +0.83 have been reported when the Leiter Scale is compared with the Weschler Intelligence Scale for Children.^{22, 23}

These results confirm that the Kent Emergency Scale is of significant reliability as a screening test for mental ages when compared with the Ammon Quick Test and with formal psychometric tests performed by clinical psychologists.

Acknowledgment

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The Law and the Customs

For years, with medicolegal cases, the courts have decided that physicians and hospitals being sued for malpractice may take refuge in the general principle that conformity with the standards and customs of practice in the local community is a basic criterion for deciding whether there had been negligence or other defects in care. The Supreme Court of the State of Washington, in 1967, questioned the narrow "locality" limitations in reversing a judgment of a lower court.

The Washington Supreme Court noted that the "locality rule" had been developed at a time when the opportunities and resources for keeping abreast of developments in medical care varied greatly between those in small rural communities and those in large metropolitan centers.

"The 'locality rule' has no present-day validity except that it may be considered as one of the elements to determine the degree of skill and care which is to be expected of the average practitioner of the class to which he belongs."

The court also stated,

"The standard of care is that established in an area coextensive with the medical and professional means available in those centers that are readily accessible for appropriate treatment of the patient." It indicated that the standard of care prevailing in Seattle would be applicable also in Aberdeen, miles away, in the case under review.—*From "Darling Case Revisited," prepared by the AMA Law Division, JAMA 206: 1875, 1968.*