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PROBLEM

In certain types of work a short test of mental alertness is quite important: (1) because of the lack of time and means required to administer a full length test, and (2) because of the motivation of the examinees. The Otis Self-Administering Test has met this demand to some extent, but it implies a certain amount of education and takes at least 20 minutes. A survey of test materials indicated some combination of the Army Alpha and Beta tests had possibilities for this type of measuring instrument. A research was undertaken to adapt some of these types of materials to a short test of alertness.

PROCEDURE

Since mental alertness or intelligence is known to have two major components, linguistic and arithmetical adeptness, the units containing these elements were selected and given to a large group of commercial drivers. The sampling was fairly representative of a cross section of the population. Item analysis of the results showed some of the items to be of little value. Consequently a test composed of graduated items was constructed consisting of the following basic units:

(a) Arithmetical reasoning — simple problems.
(b) Vocabulary — opposites.
(c) Mental arithmetic — block counting.

Only items which appeared to contribute were selected for use in the various units of the battery. The first test, of arithmetical problems, with a time limit of three minutes makes it primarily a speed test. This is necessary for satisfactory results throughout the intelligence range of the total population. It has 10 items. Test number two was built on the same basis from a scaled list of 20 items. It is essentially a power test as most subjects complete it in less than the allotted time of $1\frac{1}{2}$ minutes.

Test number three has 7 items on mental arithmetic. It is a semi-speed test, since a certain percentage of the examinees finish it in $2\frac{1}{2}$ minutes and yet err in computation. Norms based on results from a standardization of the entire test given to 1741 adults are shown in the following table I.

Table I — Norms for Iowa State Alertness Test

A = 31 or above
B = 27 — 30
C + = 23 — 26
C = 15 — 22
C — = 10 — 14
D = 6 — 9
E = 5 or below

A correlation of + .514 ± .085 with the American Council Test was obtained, which when corrected for attenuation gave an R of + .75. The reliability of the American Council Test was assumed to be about .85 although no indices were found in publications.[1] Subsequent check of reliability was made in three different ways using 72 subjects; (a) test — retest, (b) correlation of odd and even items of the first test and (c) correlation of odd and even items of second test.

RESULTS

The test described has a working time of 8½ minutes and may be scored in not to exceed 1 minute. The three methods of obtaining reliability mentioned above gave the following results.

Table II

Mean of first test	22.22	S. D.	4.50	Range 11 — 32
Mean of second test	25.48	S. D.	4.48	Range 13 — 35
Difference 3.26	S. D. difference .579			Critical ratio = 5.63

Correlation of the first and second tests gives R = + .794 ± .030.
Odd versus even items (first test) corrected by Spearman-Brown formula: R = .840.
Odd versus even items (second test) corrected by Spearman-Brown formula: R = .750.

The ranges on the odd and even items were practically the same in the first and second tests.

CONCLUSIONS

1. It may be stated that the findings in general show the reliability of the battery of tests described as being not less than R = .80.
2. The odd versus even items on the first test gave highest reliability.
3. The first test showed slightly higher internal reliability than the test-retest results.
4. A test of this type has sufficient reliability for classification of groups and might well be substituted for a more elaborate and expensive test wherever time and expense are to be considered. It is adapted to adults of any level of academic standing.

1 Paterson Schneider and Williamson, Student Guidance Techniques, p. 62.

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