A STUDY OF THE VALIDITY OF
THE ARMY GROUP EXAMINATION ALPHA
SCHRAMMEL-BRANNAN REVISION

A THESIS
SUBMITTED TO THE DEPARTMENT OF
EDUCATION AND THE GRADUATE COUNCIL OF THE KANSAS STATE
TEACHERS COLLEGE OF EMPORIA IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE

BY
CLYDE WILLIAM BAKER

JULY 1937
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EMPORIA KANSAS
The dissertation of Dr. H. E. Blumenschchein
Measurements, analysis, and suggestions have
made.

Appreciation
of Richard_One
Mildred_Wright
and the study
and thanks to
of the study.

Approved for the Major Department

K. E. Schewevel

Approved for the Graduate Council

[Signature]
ACKNOWLEDGEMENT

The writer wishes to express his sincere appreciation to Dr. H. E. Schrammel, Director of the Bureau of Educational Measurements, Kansas State Teachers College, Emporia, at whose suggestion and under whose supervision this study was made.

Acknowledgement is also given Wilbur Doudna, Principal of Richmond Grade School, and Earl Ludlum, Principal of Wildred Grade School, for their cooperation and the permission to use their schools in this study.

To my wife, Magdelena Young Baker, goes much gratitude and thanks for her help in giving the tests and her typing of the study.

C. W. B.
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CHAPTER I

INTRODUCTION

Historical Summary

When the United States entered the World War, there was a felt need for some instrument of classification which would group the recruits from the various cantonments more efficiently and with a greater degree of accuracy than officers' judgments. Such a scale was devised by a commission of psychologists. This scale is known as the Army Group Examination Alpha. The complete report covering their work in standardization, construction, use of the scale, and the results obtained may be found in the National Academy of Sciences, Memoirs.¹

The norms of the original scale were not suited for school use. James C. De Voss, former director of the Bureau of Educational Measurements, Kansas State Teachers College of Emporia, received permission to adapt the scale for use in the


Since that time this scale has been published and distributed by the Bureau of Educational Measurements.

A revised manual of instructions was published in 1927 by Wood and Schramm and norms computed from the scores of 13,671 students.3

Nature of Revised Test

The revision of the original scale was undertaken in 1925. Practically all items were taken from the original five forms.

The various items for all the forms were statistically equated and matched. The revised scale contains two hundred twenty items as compared to two hundred twelve of the original test, and in many respects is quite similar to it. Complete information relative to the exact procedure and the nature of the revision can be found in the unpublished thesis of Christine Brannan in the library of the Kansas State Teachers College of Emporia.4 Dr. R. E. Schramm also in the Transactions of the Kansas Academy of Science, also


has an account of the proposed revision of the scale. This test is known as the Army Group Examination Alpha, Schrammel-Brannan Revision and is published by the Bureau of Educational Measurements, Emporia.

Objectives of the Study

An important characteristic of any test or scale is its validity. In other words, to what extent does it measure what it purports to measure? It is the purpose of this study to determine to what degree the Schrammel-Brannan Revision of the Army Alpha Intelligence Examination compares with other tests and scales in the measurement of the concept of intelligence. The writer is interested in comparing the scale with accepted group and individual tests to ascertain its relative value as an intelligence examination. The Revised Army Alpha has many characteristics, which make it outstanding in the testing field, so it is highly desirable to know how valid a test it is.

Establishing Criteria

The problem of determining the criteria for the basis

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5 H. E. Schrammel, "The Schrammel-Brannan Revision of the Army Alpha Intelligence Examination." Transactions of the Kansas Academy of Science, Vol. XXXIX (Topeka: Kansas State Printing Plant), 1936, p. 239.
of correlation presents itself at this juncture. These were 
selected by consulting established authorities on the subject 
of intelligence testing. Pintner writes as follows:

And lastly, as various measures of intelligence 
become perfected, we can check upon any new tests 
of intelligence by comparing the results with those 
of obtained by more or less known standard measures. 
The Binet Scale serves at present as one such 
standard measure.

We must, however, avoid the assumption that the 
Binet Scale as it now exists is a perfect measure, 
and therefore, demand that all other measures show 
a high degree of correlation with it.

Tiegs states in another reference that in spite of 
the difficult problems of measurement encountered, the 
validity of intelligence tests is assumed to be very high. The measure of validity of an intelligence test must be 
obtained in an indirect way. It is usually done by correlat-
ing the new scale with other intelligence tests whose stand-
ards have been accepted. He states further that the Stanford 
Revision of the Binet-Simon Test has been used in this 
manner. He suggests a method of studying relative valid-
ity of a test of intelligence by combining the results of a 
group of tests and computing a coefficient of correlation 
between each test and the average of the others in the group.

6 Rudolph Pintner, Intelligence Testing (New York: 

7 Ernest W. Tiegs, Tests and Measurements for Teach-
In considering this information, it was decided to use the Stanford Revision of the Binet-Simon Test as an individual measure. The group test selected was the Otis Group Intelligence Scale Advanced Examination, Form B. The computed mental ages for all tests were totaled and correlated against the mental ages of each test. It was thought that a composite of the mental ages of the tests would give a more accurate and complete criterion of intelligence than any one test alone.
CHAPTER II

PRESENTATION OF DATA

Community

The communities in which the tests were given are located in fertile farming country of Kansas. Richmond is located sixteen miles south of Ottawa, Kansas. Mildred, Kansas, the second community used, is located about forty-six miles south of Ottawa, Kansas. Both are small rural towns with populations under 500. The people of Mildred are mostly skilled laborers and farmers. At one time one of the largest cement plants in Kansas operated in this little town. It is closed at the present time. Most of the skilled laborers have sought employment elsewhere; as a consequence, the town is rapidly deteriorating and the majority of those left are decidedly of the lower occupational levels. Richmond is typically a farming community. Richmond probably has a higher type of culture than the average small town, which makes it possible for them to extend more cultural advantages to their children than less fortunate communities can afford.

Neither of the schools in these towns had been tested previous to this study, so the students were in no way test wise or test conscious. Parents reacted quite favorably as evidenced by their inquiries relative to the nature of the
Schools

Schools of both communities are organized under the 8-4 plan of organization. They are standard in every respect. The children tested ranged from the fourth grade to the ninth inclusive. The average chronological age was about twelve years. Each school was approximately equally divided in regard to the number of boys and girls enrolled.

The teachers were favorable to the study and cooperated efficiently in establishing conditions whereby the best results might be obtained. Instructors in the Mildred schools were of the opinion that their pupils were a little below the average for their respective grades while teachers at Richmond felt they had on the average a superior group. This fact was later substantially corroborated by the results of the study.

Administering Tests

With the aid of Dr. H. E. Schrammel the following tests were selected and obtained from the Bureau of Educational Measurements, Emporia, Kansas, of which Dr. Schrammel is the director:

1. Otis Group Intelligence Scale Advanced Examination, Form B.
2. Army Group Examination Alpha, Schrammel-Brannan
   Revision, Form A.


4. Emporia Silent Reading Test, Form B.

The same order of administering the tests was used throughout. The Revised Army Alpha was given first, followed by the Otis Group test. These tests were given on consecutive mornings from eight-thirty o'clock until completion. After these had been given, they were followed by the Stanford Binet individual test. The tests at Richmond were administered by the writer. All the group and individual tests given at Mildred, were given by Mrs. C. W. Baker. Both the writer and Mrs. Baker have college degrees and are well qualified in testing work of this nature. Both have had college courses in the administering and interpretation of test materials.

Test Conditions

The pupils were seated in the regular classrooms for the group tests. Each occupied his regular desk so that the conditions of giving the test would correlate well with the ordinary school routine. Even though the students were seated quite near each other, cheating was a negligible factor. This can be explained in part by the very nature of the test and the close supervision exercised by the examiner.
The buildings were standard for both schools with average lighting facilities.

The group tests were given in the morning immediately after school convened. Only the instructions printed in the manual of directions were read before each test. The classroom teacher was not present during the administering of the tests.

The individual test procedure practically paralleled that for the group tests. The students were given numbers at the beginning of school each day. All went to the regular classes. As each student examined returned to class, the person holding the next number reported to the examiner.

A separate room was used for the giving of the individual tests. The room was well lighted, quiet, and well ventilated. No one was allowed in this room except the examiner and the student. It was not difficult to gain the confidence of the students, since both examiners were not entirely strangers in the community.

Scoring Tests

All the group tests were sent to the Bureau of Educational Measurements of the Kansas State Teachers College, Emporia. They were scored, checked, and rechecked so that scoring errors could be practically eliminated. Reports of the results were returned to the writer immediately. Work
sheets were then compiled from these reports.

Correlations were computed for the following: Army Group Examination Alpha Schrammel-Brannan Revision and Otis Group Intelligence Scale Advanced Examination, Form B; Army Group Examination Alpha Schrammel-Brannan Revision and Stanford Revision of the Binet-Simon Test; Stanford Revision of the Binet-Simon Test and Otis Intelligence Scale Advanced Examination, Form B.

Intelligence quotients and raw scores were used in computing these correlations.

Mental ages were computed for each test. These combined into a composite criterion and correlations computed for the Army Group Examination Alpha Schrammel-Brannan Revision and the total mental ages of the groups; Otis Intelligence Scale Advanced Examination, Form B and the total mental ages of the group; Stanford Revision of the Binet-Simon Test and the total mental ages of the group.

All computations were checked for accuracy by Harold Bechtoldt, research assistant of the Bureau of Educational Measurements.
CHAPTER III

RESULTS OBTAINED IN THE STUDY

Data from Findings of other Test Correlations

Before attempting to evaluate the correlations found in this study, or to answer the query, how good are these correlations, it might be well to examine some findings of others in similar studies.

Dearborn calculated the coefficient of correlation for the Stanford Binet and the Dearborn Series I, which he found to be .84. This is based on the I. Q's.

Pintner lists the following for the original Army Alpha examinations:

Alpha yields correlations with other measures of intelligence as follows: with officers' ratings of their men .50 to .70; with Stanford Binet measurements .80 to .90; with Trabue B and C Completion Tests combined .72; with examination Beta .80; with composite of Alpha, Beta and Stanford .94; in the case of school children, Alpha correlates with teachers' ratings .67 to .82; school marks .50 to .60.

Tiegs records the results from the correlations of fourteen group intelligence tests with the average of the


2 Rudolph Pintner, op. cit., p. 220.
other thirteen. Some of them are Terman Group .75; Otis .72; National .74; Haggerty .73. The table shows correlations from .46 to .75 for the entire group, with an average of .63.

He lists these additional correlations: Terman Group and Stanford Binet .73, N-160; Pintner-Cunningham Primary Mental Test and Stanford Binet .75, N-158; Otis General Intelligence Examination and Army Alpha .84.

Valentine found a correlation of .70 ± .04 for the Otis tests and the Stanford Binet. He states further that he thinks this correlation unquestionably high.

Gates found correlations for the Otis Advanced and Stanford Binet mental ages of .61.

Root correlated the Stanford Binet with several well known group tests and found correlations ranging from .68 ±

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3 Ernest Tiegs, op. cit., p. 504.
4 Ibid., p. 514.
6 A. I. Gates, "The correlations of achievement in school subjects with intelligence tests and other variables." Journal of Educational Psychology, Nos. 3, 4, and 5, 13:280, March, April, May, 1922. Table VI.
De Camp in testing 776 college freshmen in 1920-21 of the liberal arts and natural sciences found a correlation of .50 ± .04 for the Army Alpha and the Stanford Binet (scores were used). 8

Avery found in examining 153 children of the public schools of Fort Collins, Colorado, a town of about nine thousand people, a coefficient of correlation of .80 ± .019 for the Terman Intelligence Test, Form A with the Stanford Binet Scale. 9 These tests were limited to eleven year olds.

Wood and Schrammel 10 found a correlation between the original Army Alpha test and the Terman group test of .88 ± .01; and between the original Army Alpha test and the Thurstone Psychological examination, .77 ± .02. These were based on scores.

The Bureau of Educational Measurements, Kansas State Teachers College, Emporia, Kansas have computed the following to be a hint.


correlations: Otis S-A (raw scores) and the Army Group Examination Alpha, Schrammell-Brannan Revision .61 ± .017; Otis S-A and Schrammell-Brannan Revision Army Alpha (I. Q's.) .77 ± .02; Detroit Alpha and the Schrammell-Brannan Revision of the Army Alpha (I. Q's.) .66 ± .02; Detroit Alpha and Schrammell-Brannan Revision of the Army Alpha (raw scores) .64 ± .06.

Summarizing the above data, correlations for group tests of intelligence and the Stanford Binet range from .60 to .90; for group tests of intelligence with group tests .45 to .68. The average of these would probably fall in the seventies. These data are not conclusive nor too reliable as a measure of comparison since the different references did not always give the basis of making the correlations. Yet, they are indicative of what might be expected to be a high or reliable correlation.

Results of Present Study

Garrett explains the term "high correlation" in this manner:

Strictly speaking, the term "high correlation" should be applied only to coefficients which are .95 or above. However, in mental, social, and educational measurements there are so many actual
and potential sources of error due to the variability of the material dealt with, and the relative crudity of the measurements made, that very few tests indeed could meet this requirement. Very seldom do correlations between tests run above .70 or .75; and hence it is probably justifiable, in view of the limitations mentioned, to regard such coefficients as high.\(^1\)

Table I shows the distribution of the scores made on the Emporia Silent Reading Test, Form B. It will be noted that the mode for the distribution falls within the interval 33-35. The median score is slightly lower than the mode, falling in the first interval below the mode score. According to Table I, the median is 30. Interpreting the median score from Table I, Manual of Directions, Emporia Silent Reading Test,\(^2\) the grade equivalent for the median, 30 is found to be equal to the norm for the seventh grade for mid-year testing; and for the end-of-year testing, it is approximately equivalent to the norm for the sixth grade. The modal score translated from the same table is equivalent to the norm for the eighth grade end-of-year testing.

These facts indicate that practically all pupils made a respectable showing on the Reading Test. The reading ability of the group is sixth grade standard and above.


\(^2\)H. E. Schrammel and W. H. Gray, Manual of Directions Emporia Silent Reading Test. (Bureau of Educational Measurements, Kansas State Teachers College, Emporia, Kansas ), Table I.
TABLE I

FREQUENCY DISTRIBUTION OF THE SCORES MADE ON THE EMPORIA SILENT READING TEST

<table>
<thead>
<tr>
<th>Scores</th>
<th>Frequencies</th>
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<tbody>
<tr>
<td>36-38</td>
<td>9</td>
</tr>
<tr>
<td>33-35</td>
<td>25</td>
</tr>
<tr>
<td>30-32</td>
<td>13</td>
</tr>
<tr>
<td>27-29</td>
<td>18</td>
</tr>
<tr>
<td>24-26</td>
<td>9</td>
</tr>
<tr>
<td>21-23</td>
<td>9</td>
</tr>
<tr>
<td>18-20</td>
<td>3</td>
</tr>
<tr>
<td>15-17</td>
<td>4</td>
</tr>
<tr>
<td>12-14</td>
<td>1</td>
</tr>
<tr>
<td>9-11</td>
<td>--</td>
</tr>
<tr>
<td>6-8</td>
<td>2</td>
</tr>
<tr>
<td>3-5</td>
<td>--</td>
</tr>
</tbody>
</table>

Total Number 93
High Score 38
Median 30
Low Score 7

Read table thus:
There were nine students with scores of 36-38, etc.
Since performance on the Revised Army Alpha test depends indirectly on the pupils' ability to read the directions for each test, these students would not be handicapped because of a lack of reading skill.

Table II gives the comparative frequency distributions for the I. Q.'s. obtained on the intelligence tests. It will be observed that the distributions of I. Q.'s. for the Revised Army Alpha and the Stanford Binet show practically the same pattern in respect to central tendency and variability. The Otis test shows a wider variation, however, than either the Stanford Binet or Revised Army Alpha, and also a slightly higher central tendency. For the Otis test, most of the I. Q.'s. run from 95 to 125; for the Revised Army Alpha, 85 to 110; and for the Stanford Binet, 80 to 105.

Table III shows the inter correlations for the group and individual tests. A correlation coefficient for raw scores of .88 ± .015 for the Revised Army Alpha and the Otis was obtained. The I. Q. coefficient is not quite so high. It is .79 ± .026.

The coefficient of correlation for the Revised Army Alpha raw scores and the Stanford Binet mental age score is .75 ± .03. The coefficient for the I. Q.'s. is .71 ± .035. The difference between the coefficients of .71 and .75 is only .04. It is logical to conclude that since the difference is small, both the Revised Army Alpha and the Stanford Binet
TABLE II

COMPARATIVE FREQUENCY DISTRIBUTION FOR THE I. Q.'S. OF THE OTIS GROUP INTELLIGENCE SCALE ADVANCED EXAMINATION, FORM B; ARMY GROUP EXAMINATION ALPHA, SCHRAMEL-BRANNAN REVISION; STANFORD REVISION OF THE BINET-SIMON

<table>
<thead>
<tr>
<th>I. Q.'s.</th>
<th>Otis Group Form B</th>
<th>Revised Army Alpha</th>
<th>Stanford Revision Binet-Simon</th>
</tr>
</thead>
<tbody>
<tr>
<td>150--154</td>
<td>1</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>145--149</td>
<td>2</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>140--144</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>135--139</td>
<td>--</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>130--134</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>125--129</td>
<td>6</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>120--124</td>
<td>10</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>115--119</td>
<td>12</td>
<td>1</td>
<td>4</td>
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<td>110--114</td>
<td>7</td>
<td>9</td>
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<td>10</td>
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</tr>
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<td>100--104</td>
<td>10</td>
<td>15</td>
<td>13</td>
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<tr>
<td>95--99</td>
<td>15</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>90--94</td>
<td>5</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>85--89</td>
<td>3</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>80--84</td>
<td>3</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>75--79</td>
<td>3</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>70--74</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>65--69</td>
<td>--</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Total No. 92 92 92
Median 107.3 99.5 95.7
Mean 107.9 99.89 96.41
Standard Deviation 15.52 14.75 14.55

Read table thus: There is only one student with an I. Q. from 150-154 for the Otis Group test. There are two students for the Otis Group test; two for the Revised Army Alpha test; and one for the Stanford Binet test, with I. Q.'s. from 130-134.
TABLE III

INTER CORRELATIONS BETWEEN THE TESTS

<table>
<thead>
<tr>
<th>Tests</th>
<th>Raw Scores</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correlation</td>
<td>P. E.</td>
<td>Correlation</td>
</tr>
<tr>
<td>Revised Army Alpha and Otis Group, Form B</td>
<td>.83</td>
<td>.015</td>
<td>.79</td>
</tr>
<tr>
<td>Otis Group, Form B and Stanford Revision of Binet-Simon</td>
<td>.81</td>
<td>.024</td>
<td>.77</td>
</tr>
<tr>
<td>Revised Army Alpha and Stanford Revision of Binet-Simon</td>
<td>.75</td>
<td>.03</td>
<td>.71</td>
</tr>
</tbody>
</table>

Read table thus: The correlation between the Army Group Examination Alpha, Schrammel-Brannan Revision and the Otis Group Intelligence Scale, Advanced Examination, Form B, raw scores was .88 ± .015; I. Q's., .79 ± .026.
interpret raw scores into I. Q.'s, in about the same manner and the difference in the coefficients is due probably to a difference in the scores rather than a difference in the interpretation.

In examining Table III, the coefficients of correlation of .88 for raw scores and .79 for I. Q.'s, shows a difference of .09 when the Revised Army Alpha test was compared with the Otis Group test. This would lead to the assumption that the difference here being much larger, it was due not only to a difference in raw scores but also to a difference in interpretation of raw scores into I. Q.'s.

Table IV shows the correlations obtained between the mental ages for each test and the average mental ages of the tests combined. The Revised Army Alpha test is second with a coefficient of .93 ± .01 when correlated with the average mental ages criterion of the three tests. A spurious factor enters into this correlation which might detract somewhat from its validity. However, the Revised Army Alpha and the Stanford Binet mental ages are practically the same. The Otis Group mental ages being a little higher would probably explain the higher correlation for this test and the total mental age criterion.

Garrett is of the opinion that it is valid to compare the correlations of the separate tests with the composite
TABLE IV

CORRELATIONS BETWEEN THE MENTAL AGES OBTAINED FROM EACH TEST AND THE AVERAGE MENTAL AGE OF THE THREE TESTS COMBINED

<table>
<thead>
<tr>
<th>Average Mental Ages and</th>
<th>Correlation</th>
<th>P. E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revised Army Alpha</td>
<td>.93</td>
<td>.01</td>
</tr>
<tr>
<td>Otis Group</td>
<td>.95</td>
<td>.007</td>
</tr>
<tr>
<td>Stanford Binet</td>
<td>.91</td>
<td>.012</td>
</tr>
</tbody>
</table>

Read table thus: For the Army Group Examination Alpha, Schrammel-Brannan Revision and the total mental ages criterion, the coefficient of correlation equals .93 ± .01.
scores in order to discover which tests are most representative of the capacity measured by them all. This is true, he explains, if the separate tests contribute approximately the same amount to the composite of them all.

The Stanford Binet and the Revised Army Alpha more nearly parallel each other in this respect with coefficients of .91 and .93 respectively. The fact that all three coefficients range from .91 to .95 would indicate that the tests contributed practically the same amount to the composite.

From the data presented in Table V, a comparison of results for the three tests may be made. It will be noted that the Otis Group test yields high I. Q.'s., higher than those of either the Revised Army Alpha test or the Stanford Binet test. The I. Q.'s. of the Revised Army Alpha test and the Stanford Binet test show practically the same range. The range for the I. Q.'s. of the Revised Army Alpha runs from 66 to 138, while the I. Q.'s. of the Stanford Binet range from 68 to 140. The Revised Army Alpha test is two points lower than the Stanford Binet for the I. Q. range.

If the average I. Q. of 100 is set up as a standard, and assuming that the groups used in this study are average, the test which would come nearest to a mean I. Q. of 100

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### TABLE V

COMPARISON OF RESULTS FOR THE
OTIS GROUP INTELLIGENCE SCALE ADVANCED EXAMINATION, FORM B;
ARMY GROUP EXAMINATION ALPHA, SCHRAMMEL-BRANAN REVISION;
STANFORD REVISION OF THE BINET-SIMON

<table>
<thead>
<tr>
<th>Tests</th>
<th>No. of Cases</th>
<th>Highest I. Q.</th>
<th>Lowest I. Q.</th>
<th>Third Quartile</th>
<th>Median</th>
<th>First Quartile</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revised Army Alpha</td>
<td>92</td>
<td>153</td>
<td>66</td>
<td>108.5</td>
<td>99.5</td>
<td>89.0</td>
<td>99.29</td>
<td>14.75</td>
</tr>
<tr>
<td>Otis Group, Form B</td>
<td>92</td>
<td>150</td>
<td>71</td>
<td>117.4</td>
<td>107.3</td>
<td>96.8</td>
<td>107.9</td>
<td>16.52</td>
</tr>
<tr>
<td>Stanford Revision</td>
<td>92</td>
<td>140</td>
<td>68</td>
<td>104.2</td>
<td>95.7</td>
<td>85.6</td>
<td>96.41</td>
<td>14.55</td>
</tr>
</tbody>
</table>

Read table thus: For the Army Alpha Examination Alpha, Schrammel-Branan Revision there were 92 cases, highest I. Q. is 153; lowest I. Q. is 66; third quartile is 108.5; and so on.
would, perhaps, be more representative of the capacity measured by the three tests. In studying Table V, it is found that the mean I. Q. of 99.29 for the Revised Army Alpha test comes nearest to the average of 100, in fact, it is practically equal to it. The Otis Group test ranks third in this respect; and the Stanford Binet, second. The point the writer is trying to make here is that the Revised Army Alpha test comes the nearest of the three tests in designating the groups used in the study as average. This fact, that the classes were average, compares favorably with the teachers' estimates of the intelligence of the groups in this study.

The most reliable measure of variability is the standard deviation. In Table V, the sigmas of the Revised Army Alpha and the Stanford Binet are 14.75 and 14.55 respectively, indicating that the I. Q.'s. of the two tests have grouped themselves almost identically. The larger sigma of 16.52 for the Otis Group represents a greater dispersion of I. Q.'s.

In Figure 1, the graph of the I. Q.'s. for the three tests, indicates that the curve for the Revised Army Alpha and the Stanford Binet are very similar, more so than either of them and the Otis Group. The distributions for the Revised Army Alpha test and the Stanford Binet test are about normal. There is little indication of skewness.
FIGURE 1

A GRAPHICAL COMPARISON OF THE I.Q.'S. OBTAINED BY EACH OF THE THREE INTELLIGENCE TESTS
1. The Revised Army Alpha test correlates highly with the Otis Group test. The coefficient of .68 ± .015 is in keeping with what others have found for group tests of intelligence.

2. The Revised Army Alpha when correlated with the Stanford Binet shows a coefficient of .75 ± .03 for raw scores and .71 ± .035 for I. Q's. This is also a high correlation when compared with the results of other group tests of intelligence with the Stanford Binet.

3. The Revised Army Alpha test is better than the Stanford Binet and not so good as the Otis Group when it is correlated with a composite of the mental ages of the three tests. The coefficient of .93 ± .01 for the correlation of the Revised Army Alpha and the composite criterion of mental ages would indicate that the Revised Army Alpha was highly representative of the capacity measured by them all.

4. The Army Group Examination Alpha, Schrammel-Brannan Revision comes nearer the average I. Q. of 100 than either the Otis Group Intelligence Scale Advanced Examination, Form B or the Stanford Revision of the Binet-Simon.

5. It may be concluded that the mental ages and consequently the I. Q's. derived from group testing with Army Alpha Group Examination Alpha, Schrammel-Brannan...
Revision are about as dependable as the mental ages and I. Q.'s. secured through individual testing with the Stanford Revision of the Binet-Simon tests.
SUMMARY AND CONCLUSIONS

The original Army Alpha scale was devised during the World War. It was necessary to compute norms which would adapt the test for school use. This was done by James C. De Voss, and later by Wood and Schrammel.

In 1935, a suggested revision of the test was undertaken by Christine Brannan, which would bring the scale up to date in modern testing procedure.

The writer became interested in determining the validity of the revised test. This interest consummated in a proposed study for this objective. Criteria were established and communities were selected for use in making the purposed study.

The towns used were typical small, rural communities with standard schools. The grades used ranged from the fourth to the ninth inclusive. All tests were given under the direct supervision of the writer or Mrs. G. W. Baker, the other examiner. The scoring and the checking were done in the Bureau of Educational Measurements, Emporia. The correlations were computed by the writer and these results checked by the research assistant of the Bureau of Measurements.
Other studies could not be found of this nature, but some correlations were found for various group and individual tests of intelligence. It was found through these investigations that a coefficient of correlation of .70 or better was indicative of a high relationship.

The purpose of this study was to determine the validity of the Revised Army Alpha test as an intelligence examination, when it is compared with other accepted tests in this field.

The study disclosed that the Revised Army Alpha test correlates highly with the Otis Group Test. The coefficient of .88 ± .015 is very high when compared with what others have found for group tests of intelligence.

The Revised Army Alpha ranks exceedingly well with the Stanford Binet as a test of intelligence. A correlation of .75 ± .03 shows a high degree of relationship for the tests.

The criterion of the mental ages for the average of the three tests was correlated with the Revised Army Alpha mental ages. This gave a correlation of .93 ± .01. This coefficient is very high. It is not significant for this fact alone, but it does indicate that the Revised Army Alpha test measures traits or capacities represented by the three tests equally as well as either the Otis or Stanford Binet.

The mean I. Q. for the Revised Army Alpha test is closer to 100 (the average) than either the Otis, which is
above; or the Stanford Binet, which is below.

In conclusion, the mental ages, and consequently the I. Q.'s, derived from group testing with the Revised Army Alpha, are more dependable than those obtained by the Otis Group test, since the results on the Revised test more nearly parallel those of the Stanford Binet than does the Otis.

Lastly, the mental ages of the Revised Army Alpha test are as dependable as the mental ages secured through the longer and more tedious program of individual testing with the Stanford Binet scale.
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