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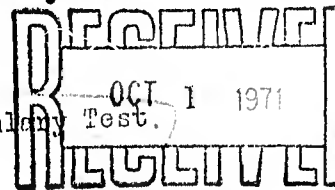
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Study No. 466

MCU-PRS

9 September 1943

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DEVELOPMENT OF BASIC CLASSIFICATION BATTERY.

The Influence of General Information in the Reading and Vocabulary Test.

1. Introduction.

The Reading and Vocabulary part of the Basic Classification Battery was developed with the assumption that its value would be enhanced by the use of paragraphs dealing with topics of intrinsic interest to the men. The application of this assumption took the direction of dealing with rather general topics. This gave rise to the hypothesis that too many men would be able to answer the questions without recourse to the basic paragraphs. Since the Basic Classification Battery is an attempt to minimize the degree of overlap between Classification tests, the question of the degree to which performance on this test was independent of the skills needed in reading the basic paragraphs is important to answer.

In order to test the hypothesis that general information could play a large role in performance on this test, it was decided to administer the questions to a group of men without giving them the opportunity to read the basic paragraphs. Because of convenience and availability, the Enlisted Classification School at Washington and Jefferson College was chosen as the locale for the collection of the experimental data. The fact that the minimum General Classification Test score for qualification for this school is 100 meant that the population would represent the upper half of the range of talent in the army. This was not too serious a deficiency for the purposes of the study because the bottom half of the range would very likely have difficulty in comprehending and accepting the experimental conditions.

The items used in this study (approximately 300) were chosen from the original draft of the test, comprising approximately 450 items. The items eliminated were those that seemed least susceptible of being answered without the paragraph. The test was altered to conform with the change of conditions, e.g. many of the statements "according to the paragraph" were removed.

2. Purpose.

This study was designed to test the hypothesis that without opportunity to read the basic paragraphs, the alternative answers to the questions in the Reading and Vocabulary Test will be chosen in chance fashion.

3. Population.

Approximately 220 enlisted men of the Enlisted Classification School were given the test. The distribution of this group with respect to GCT Army grade was approximately 80 Grade I, 80 Grade II, and 60 Grade III.

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Due to certain difficulties in matching numbers of the items with numbers on the answer sheet, about 55 cases had to be eliminated because of questionable identification of the responses. This left a total of 165 men distributed by army grade in the following fashion: 64 Grade I, 66 Grade II, and 35 Grade III. The men in this group were virtually all high school graduates and approximately half had taken at least one year of college work. The training at the school consisted primarily of instruction in classification procedures rather than in psychological test theory. However, it must be assumed that this group has more knowledge relating to classification and to psychological theory than would be found in a group representative of the Army as a whole. This fact will modify the interpretation of those items dealing with classification or psychological data.

#### 4. Results.

Item counts on all four alternatives were made by Army grade. Since the distributions by Army grade were very similar it was decided to treat the group as a whole. The percent choosing each alternative for each item will not be tabled, but are presented on a copy of the test appended to this report.

In making up a distribution of the percent choosing the correct alternative for each item, it was deemed desirable to break down the distribution according to type of item. The following system of classification was used:

The right answer depends upon identifying:

1. A fact or idea stated in the paragraph.
2. A fact or idea not stated in the paragraph.
3. A fact or idea implied in the paragraph.
4. A fact or idea not implied in the paragraph.
5. A summary statement of the paragraph.
6. Correct classification of a series of statements based on the paragraph. The type of classification used varied from series to series, e.g. in one it would be a classification of truth or falsity of the statements, in another it would be a classification of degree of implication of the statement by the paragraph. Thus this is a heterogeneous grouping.
7. A correct interpretation of a given statement. This type of item differed from type 3 in that the statement was self-contained in not depending upon the paragraph for interpretation.
8. A correct synonym for a given word or phrase. Presumably the usage of the word in the paragraph gave it a different than usual interpretation.
9. The correct order in which a series of statements appeared in the paragraph.

TABLE I

FREQUENCY DISTRIBUTION OF PERCENTS ANSWERING ITEMS CORRECTLY IN  
TERMS OF CLASSIFICATION OF ITEMS

Percent Correct	Item Classification									TOTAL
	1	2	3	4	5	6	7	8	9	
90-99	14		1					1		16
80-89	11	1	2			1		3		16
70-79	3	1	5	1	3	4	2	9		28
60-69	13	2	3	1	1	2	1	8		31
50-59	14	1	5		6	2		8		36
40-49	12	3	2	4	3	3		8		35
30-39	18	3	1	2	5	6		8	1	44
20-29	20	1	3	1	6	4	1	6		42
10-19	12	6	1		5	5		7		36
0-9	3				2	1		4		10
Total	120	18	23	9	31	28	4	62	1	296

Table I presents the distribution of the percents correct on the items according to the type of item. If the alternatives were chosen by chance, 25 percent would be expected to choose the right alternative. By the usual formula the standard error of this percent would be .033 and any difference greater than 10 percent points would be significant. As a crude estimate we might say that any percent correct of 60 and above would most likely not be due to chance, that percents correct between 40 and 60 would represent a doubtful area of significance in deviation from chance expectation, percents correct between 20 and 40 would very likely represent chance variations, and percents correct between 0-20 would represent a rather crudely defined area of significant variation below chance expectation.

On the basis of this reasoning, it can be seen that almost a third of the items could unquestionably be answered correctly without guessing and that still another third might also be considered to have been answered correctly above chance expectation. About one-sixth of the items seem to have been answered incorrectly more than chance expectation would allow. Those items may be presumed to be the best items in the test since the removal of the basic paragraphs will cause a definite tendency to choose a wrong alternative.



TABLE II

COMPARISON OF ACTUAL DISTRIBUTION OF PERCENTS CORRECT WITH  
DISTRIBUTION EXPECTED ON ASSUMPTION OF INDEPENDENCE, INCLUDING  
CHI-SQUARE VALUES

Percent Correct		Item Classification						
		1	2	3	5	6	8	
60-99	Actual	41	4	11	4	7	21	
	Expected	37.71	5.66	7.23	9.74	8.17	19.49	
	Chi-Square	0.29	0.49	1.97	3.38	0.17	0.12	
40-59	Actual	26	4	7	9	9	16	
	Expected	30.43	4.56	5.83	7.86	6.59	15.72	
	Chi-Square	0.64	0.07	0.21	0.17	0.88	0.00	
20-39	Actual	38	4	4	11	9	14	
	Expected	34.29	5.14	6.57	8.86	7.43	17.71	
	Chi-Square	0.40	0.25	1.01	0.52	0.33	0.78	
0-19	Actual	15	6	1	7	1	11	
	Expected	17.57	2.64	3.37	4.54	3.81	9.08	
	Chi-Square	0.38	4.28*	1.67	1.33	2.07	0.41	
Total	Chi-Square	1.71	5.09	4.06	5.40	3.45	1.31	21.82

\* This value is the only one in the table to which any significance could be attached. It has a probability of occurrence by chance of between 2 and 5 percent.

Table II shows the results of the chi-square test of the independence of the distribution of item difficulty and types of items. Two aspects of this table should be explained. First type 4, 7 and 9 were not included because these were not represented with sufficient frequency. Second, the telescoping of the data into the four groupings of percent correct, while concealing some of the facts was necessary in order to prevent too many cells with zero or near zero entries.

As this table indicates, there was a definite tendency for the distributions to show an overall independence. In only one cell was there any definite tendency to deviate from chance expectation. This was the case where a greater number of men than expected by chance answered incorrectly the items involving an identification of a fact, or idea not contained in the paragraph (type 2). Bordering on reliability was the tendency for less men than expected to select the correct summary statement (type 5) with a frequency equivalent to the 60-99 percent correct area.



Although concealed in Table II, attention should be called to the fact indicated in Table I that virtually all of the items answered correctly by 90 percent or more of the men were of the type involving an identification of a fact or idea stated in the paragraph (type 1).

#### 5. Discussion.

From the evidence presented, there seems little doubt that the materials in this test are of such a nature as to make them susceptible of being answered correctly (without recourse to the reading materials) by the upper half of the range of talent. Since the test attempts to secure a direct measure of reading skills, this is an aspect of the test which should be minimized. Failure to do this may lead to an undesirable degree of intercorrelation with other tests in the battery. In addition, it is probable that the test would prove too easy for the high level people.

The conclusion that the items can be answered correctly without recourse to the paragraphs is buttressed by certain interrelations in the data. It was shown that the items that were most consistently answered by virtually all of the men were those involving the identification of a fact or idea contained in the paragraph. Where it was possible to answer items without recourse to the paragraphs, it is probably attributable to the fact that the materials deal with matters of general information. It is logical to suppose that items dealing directly with the facts would be easiest to answer correctly. Likewise, it may be assumed that items dealing with facts which were not mentioned in the paragraph would be susceptible to being answered incorrectly, particularly where one of the wrong alternatives is a true statement. The results were consistent in supporting this reasoning.

#### 6. Conclusions.

1. There is clear evidence that a large proportion of the items in the original untried form of the Reading and Vocabulary Test can be answered correctly without reading the paragraphs by a significant proportion of men in the upper half of the range of talent.

2. There is a decided tendency to answer correctly those types of items requiring an identification of a fact or ideas directly treated in the paragraph.

3. The likelihood of choosing a wrong answer for types of items involving an identification of a fact or idea not stated in the paragraph is greater than for other types.

4. These findings should be taken into account in the revisions of the original test.