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**VALIDATION OF WCT-2 AS A PREDICTOR OF SUCCESS
IN WAC OFFICER CANDIDATE SCHOOLS,
FORT OGLETHORPE, OCTOBER 1943.**

Purpose:

To determine the usefulness of WCT-2 scores in predicting academic grades and ratings on leadership in WAC Officer Candidate Schools.

Variables:

A detailed description of the content of academic grades and of the leadership ratings is included in the computation folder.

1. Mental alertness raw scores:-WCT-2 is a second form of WCT-1, X-2 and was designed for determining the acceptability of WAC recruits. It includes 145 items, of which 29 are best labelled Arithmetic Reasoning, 45 Vocabulary, 12 Proverb, 42 General Information, 7 Judgment, and 10 Reading.

2. GCT standard scores.

3. Academic grades:-A continuous variable was obtained from a three-category statement as to grade by assigning numerical values of 2, 1, and 0 to these three categories and summing for all courses. Since 12 courses had been taken by the 42nd class and 2 by the 44th, it seemed advisable to make no attempt to equate scale values of academic grades in the two populations.

4. Placement by ratings of other officer candidates in the upper, middle, and lower third of their class with respect to leadership.

5. Checking, by faculty members, of yes, no or question mark (?) in response to a question as to whether the candidate was considered to be officer material.

Populations:

1. The 42nd, 43rd, and 44th Officer Candidate Classes at Ft. Oglethorpe, Ga. constituted the populations on which data were obtained. N's were respectively 89, 47, and 93. Because of the small number of cases involved, data obtained for the 43rd class were never processed.

2. Officer candidates were selected as having GCT standard scores higher than 110, and as having qualities of leadership. The latter variable is determined by ratings and interviews. In the case of the school at Ft. Oglethorpe, it is probable that the GCT standards were in effect somewhat higher than 110, since the facilities available were too limited to handle all persons meeting the entrance requirements, with consequent encouragement of more rigid selection.

Procedure:

1. Admission of Tests
 - a. The administration of WCT-2 was supervised by a representative of this office.
 - b. AGCT scores, academic grades and ratings were obtained from Army records.

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2. Statistical

a. Intercorrelations between WCT-2, GCT, grades, and ratings by classmates were computed separately within the 42nd and the 44th Officer Candidate Classes. Computations were not prepared within the 43rd class since the number of cases was too small. The 42nd was not combined with the 44th because of previously discussed differences in the academic grade variable.

b. Bi-serial correlations were computed between ratings of instructors and the remaining variables in the 44th Officer Candidate Class. The three-fold was reduced to a two-fold category by combining the questionable and unsatisfactory ratings. Unsatisfactory ratings were so few as to be negligible. These correlations could not be computed in the 42nd Officer Candidate Class because of the very small percentages obtaining ratings other than satisfactory.

c. Means and standard deviations were computed for GCT, WCT-2, and academic grades in the 42nd and 44th Officer Candidate Classes. Since ratings by classmates divided the class into upper, middle, or lower third on leadership, the mean and standard deviation of this group gives no information beyond this statement. In the case of ratings by instructors, the distributions can be more directly and meaningfully described by giving the frequency distributions.

Results:

1. a. The means and standard deviations of WCT-2, GCT, and the academic grade variable are given in Table I for the 42nd and the 44th Officer Candidate Classes. Excepting in the case of WCT-2 and academic grades, differences between the two classes are inappreciable. The difference between the WCT-2 means is significant at .05 level but not at the .01 level. If it is a real difference, no ready explanation for it can be offered. The difference in the means and standard deviations of the academic grades is due to the fact that the 42nd class had completed 12 courses and the 44th only 2 courses. The variable academic grades, it will be remembered, was simply the sum of the grades in each of the courses with grades being reported in three categories and assigned the numerical values of 2, 1, and 0.

b. The very high mean and low standard deviation of GCT scores indicates that selection on this variable is greater than the critical entrance score of 110 would seem to indicate. A group of MAC's in basic training at Ft. Oglethorpe had a mean GCT score 108.3 and a standard deviation 15.0. The corresponding values for WCT-2 on this group was 85.6 and 23.6. Since the correlation between these tests in the population of basics is .837, selection on the one variable implies selection on the other.

c. Means and standard deviations of the leadership ratings by classmates lack meaning since these ratings were simply an indication as to whether the officer candidates were placed in the upper, middle, or the lower third. Hence, these statistics were not included in Table I.

d. In the 42nd Officer Candidate Class, ratings by instructors were satisfactory, except in the case of 5 out of the 89 ratings. In the 44th Officer Candidate Class, 61 were listed as having the potentialities of a good officer, 7 were indicated as not having such potentialities and the remaining 25 were considered questionable.

2. Table II lists the intercorrelations between the several variables involved in the present study separately for the 42nd and the 44th classes.

a. It should be noted that correlations of GCT and WCT-2 with academic grades were substantially the same in both populations even though the variables consisted of the sum of grades for 12 courses in the 42nd Officer Candidate Class and the sum of only 2 courses in the 44th class. It would be expected that added reliability resulting from use of additional course grades in the 42nd class would contribute at least appreciably to the correlation of WCT-2 and GCT with grades. The reasons for the insignificant differences cannot be determined.

b. The correlations with officer candidate ratings were insignificant in all instances, a finding to be expected.

c. The most significant finding in Table II is the apparent superiority of WCT-2 over GCT as a predictor of academic grades. In comparing the validity coefficients of WCT-2 and GCT in a population of trainees, the latter variable is at a disadvantage in that trainees have been selected on GCT. Consequently, it was desired to estimate these coefficients for a population unselected on GCT but selected by means of other variables employed in eliminating prospective officer candidates. In order to do this, it was necessary to determine the standard deviation of GCT within the population for which the estimates are desired. Upon the assumptions that among WAC's at large a normally distributed composite of those selective variables correlates with GCT .4*, that one-half of the general population of WAC's are eliminated by selective factors other than GCT, and that WAC officer candidates are almost entirely whites, the standard deviation of GCT is estimated as 12.5. Validities of GCT and WCT-2, respectively, are estimated as .35 and .47 by means of the formulae**

$$r'_{GCT.y} = r_{GCT.y} \frac{k}{\sqrt{r^2_{GCT.y}(k^2 - 1) + 1}}$$

and

$$r'_{WCT.y} = \frac{r_{WCT.y} + (k^2 - 1) r_{GCT.y} r_{WCT.GCT}}{\sqrt{r^2_{GCT.y}(k^2 - 1) + 1} \sqrt{r^2_{GCT.WCT}(k^2 - 1) + 1}}$$

where y is criterion and k is the ratio $\frac{\sigma_{GCT} \text{ before selection on GCT}}{\sigma_{GCT} \text{ after selection on GCT}}$.

*While GCT correlates insignificantly with leadership ratings (the principal selective factor other than GCT) in a population of officer candidates, the correlation in a general population of WAC's is almost certainly higher. When a small upper portion of a population is selected on the composite of two variables, the correlation between these variables within the selected population is considerably biased in the negative direction. It is felt that the estimate given is a conservative one. A higher correlation would result in greater estimated difference in the two validities.

**Derivation of these formulae are in the files of the Statistical Services Unit.

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3. Since in Class 44, 32 of the population were listed as questionable officer candidate material, it seemed worthwhile to compute bi-serial correlation coefficients between this and the remaining variables. The results may be summarized briefly by stating that the correlation with ratings by classmates is .84 while the relationship to other variables is inappreciable. While, in the 42nd class, too few were mentioned as other than satisfactory to warrant statistical analysis, it might be noted that the five persons listed as lacking potentialities as officers by the faculty were also listed by their classmates as being in the lower third of the class with respect to leadership.

Conclusions:

1. WCT-2 has appreciably higher validity than GCT in predicting officer candidate success.
2. None of the variables here considered correlate with ratings on leadership.

Recommendations:

1. It is recommended that WCT-2 scores be entered on WAC records in order that they may be considered in estimating academic success in officer candidate schools.
2. A more detailed study of the problem of predicting leadership ratings would seem to be required before very much can be said on this problem.

TABLE I

Means and Standard Deviations of Mental Alertness-2
GCT, and the Academic Grade Variable for
the 42nd and 44th Officer Candidate Classes
Fort Oglethorpe, October 1943

	<u>42nd Officer Candidate Class</u>		<u>44th Officer Candidate Class</u>	
	<u>Means</u>	<u>Standard Deviations</u>	<u>Means</u>	<u>Standard Deviations</u>
WCT-2 (Raw Scores)	100.6	15.6	106.2	15.3
GCT (Standard Scores)	124.3	9.2	123.1	8.4
Grades	19.3	3.4	3.4	.79

TABLE II

The Intercorrelations of MAT-2, GCT, Academic Grades
and Leaderships Ratings in the 42nd and 44th Officer Candidate
Classes - Fort Oglethorpe, October 1943

	<u>2</u>	<u>42nd Class</u> <u>3</u>	<u>4</u>
1. MAT-2	.629	.423	-.088
2. GCT		.263	-.074
3. Grades			.107
4. Leadership Ratings			

	<u>2</u>	<u>44th Class</u> <u>3</u>	<u>4</u>
1. MAT-2	.581	.414	.094
2. GCT		.249	.017
3. Grades			.063
4. Leadership Ratings			