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(6) VALIDATION OF OCS SELECTION INSTRUMENTS FOR INFANTRY AND
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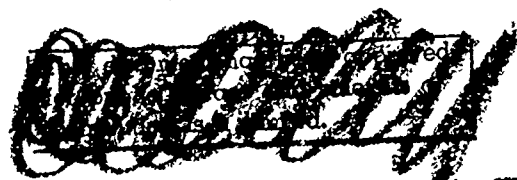(14) APO-PRS-RESEARCH
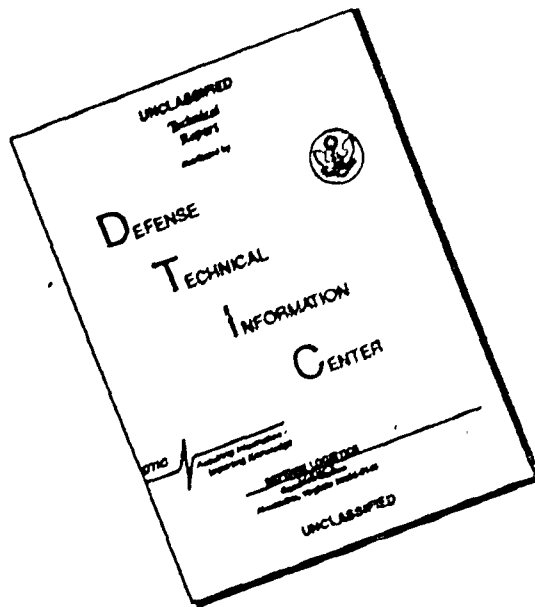NOTE-52-81

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VALIDATION OF OCS SELECTION INSTRUMENTS FOR INFANTRY AND FIELD ARTILLERY OFFICER CANDIDATE SCHOOLS

I. NATURE OF THE PROBLEM

This project is concerned with the validation of selection instruments in two branch material officer candidate schools. It is an attempt to determine the usefulness of these instruments in their present form, and to survey a few modifications both of the instruments, and of methods of studying them.

In an earlier program (PR 3405), a comprehensive study was made of selection instruments in the branch immaterial officer candidate school. Before the results of this program could be adequately utilized in revising instruments and implementing changes in the program of selection for this officer candidate school, the Army's officer candidate program underwent major changes Within a ten month period, seven new branch material schools were placed in operation, and regulations governing selection and assignment of applicants were revised.

Present research in officer candidate selection (PR 3407) is designed to survey this expanded and modified Army program. In the interim, between plan ning of this new research and collection of data for anticipated analysis, an opportunity was presented to study a few classes in the first two of the new officer candidate schools.

While the data available for these early new classes did not cover all candidates enrolled in them, and while these candidates were selected for attendance under regulations which are now superseded, it was felt that a limited analysis would be advantageous. The data, while incomplete, concerned classes still in schools; and it was felt that differences in selection and school procedures between these and later classes to be studied would not render the information entirely useless.

For the most part, the earlier program consisted of validation of operational selection instruments against leadership ratings of graduates. This approach probably contains restriction in range problems; it certainly relies entirely upon a selected few criterion measures. In this new project, it was intended to repeat a part of this earlier survey in the new samples to determine if the low correlations obtained in the branch immaterial school were unique for that situation. In addition, it was intended to try out other methods of obtaining estimates of validity. It was hoped that the experimentation in this project would provide a basis for more constructive analyses of the data to be collected in the major portions of PR 3407.

II. POPULATION

Samples surveyed in this project consisted of all candidates admitted to the first five classes of the new Infantry and Field Artillery OCSs, for whom selection information was available. The period covered ranges from the input of class 1 in February, 1951, to the graduation of class 5 in December, 1951.

During the spring of 1951, a quantity of selection data (IBM answer sheets for the Officer Candidate Biographical Information Blank, OCB-3, PRT 730; Officer Candidate Applicant Conduct of the Interview, OCI-4, PRT 737; and Officer Candidate Applicant Evaluation Report, Form OCE-2, PRT 652) was received, pertaining to OCS applicants who had recently been processed and selected for these schools. Rosters of candidates in the first five classes in the Infantry and Field Artillery OCS were supplied by the two schools, and these rosters were matched against the available criterion data. It was found that the proportion of candidates for whom criterion data were available decreased with each successive class; that is, many candidates were drawn from class 1, but only a very few from class 5.

It was necessary, in the course of the study, to separate the candidates in the sample into graduates, failures for leadership reasons, and failures for other than leadership. The designation of the graduate group presented no problems. The designation of reasons for non-graduation required special attention, however. It was known, from information gained in earlier visits to the schools, that officially-stated reasons for relief or resignation would not provide satisfactory categories for research purposes; this was especially true of cases of resignation, which constituted the bulk of the non-graduate group in the Field Artillery School. It was therefore decided to review all the data provided by the schools for each non-graduate, and to make an individual determination based upon available criterion measures. In general, a non-graduate was designated as a leadership failure if his leadership scores were substantially low, regardless of officially reported reasons for the termination of his status. While this group included all candidates officially relieved for leadership reasons, it contained many others who also failed academically, or who resigned or were relieved for lack of motivation, disciplinary reasons, etc. Purely academic failures, hardship cases, physically disqualified candidates, and those for whom no leadership measures were provided, were designated as having failed for reasons other than leadership.

At the time these candidates were selected for OCS, regulations provided for application directly from civilian life. Applicants taking advantage of this provision were interviewed, and completed the BIB (OCB-3) but received no evaluation report (OCE-2). Within the samples drawn from the two schools there were many cases for whom only BIB and interview scores (OCI-4) were available. The effect of this was to reduce the size of the available sample wherever computations involving the evaluation report, or the composite score (which includes the evaluation report) were concerned.

The samples employed, categorized by criterion groups, are given below:

A. Infantry OCS: 311 cases

    1. Graduates: 217, of whom 150 had evaluation reports (OCE-2)
    2. Leadership failures: 72, of whom 50 had evaluation reports (OCE-2)
    3. Other failures: 22, of whom 13 had evaluation reports (OCE-2)

- 2 -

B. The Field Artillery OCS: 126 cases

      1. Graduates: 63, of whom 40 had evaluation reports (OCE-2)
      2. Leadership failures: 39, 25 with evaluation reports (OCE-2)
      3. Other failures: 19, 12 with evaluation reports (OCE-2)

For the most part, this study is concerned with the graduates and the leadership failures. To the extent that the project is concerned with an analysis of leadership predictors, the "other failures" are regarded as a group whose performance in OCS involves essentially different factors which are not predictable with non-cognitive instruments.

These samples contain approximately half of the total enrollment of the first five classes at the Infantry OCS, and slightly less than one third of those at the Artillery School. The ratio of graduates to non-graduates in the samples closely approximates the ratios within the total group. (Percentage of graduates within the total groups are estimated to be 70% for the Infantry OCS, 56% for Field Artillery; within the samples, percentage of graduates were 70% and 54%, respectively.) Due to the larger number of cases in its sample (both proportionately and in absolute numbers), and because the data afforded sounder opportunities for the classification of non-graduates, greater emphasis was placed upon the sample obtained from the Infantry School.

III. VARIABLES

Throughout this report, variables are numbered in accordance with a code established for the program as a whole. In presenting the variables in this section, however, an additional, parenthetical reference is made to the number assigned each variable in the course of the statistical analyses. This second statistical code was in use before the program coding system was developed; it has applicability only for reference to statistical work performed for this project.

A. Predictors

      1. Army General Classification Test, AGCT   (7)

      2. Officer Candidate Test, OCT-1 or OCT-2, PRT 66 or PRT 69.
These are parallel forms of a higher level cognitive examination, used as an academic screen in addition to the AGCT.   (8)

      100. Officer Candidate Applicant Evaluation Report, OCE-2, PRT 652, graphic and forced choice rating scale estimating leadership ability completed for each applicant by his superior non-commissioned officer.   (1)

      110. Officer Candidate Applicant Conduct of the Interview, OCI-4, PRT 737. Also a graphic and forced choice rating instrument on which the members of the interview panel record their impressions in a structured interview situation as to whether the applicant is good officer material.   (5)

      130. Officer Candidate Biographical Information Blank, OCB-5, PRT 755. Operational key. The OCB-5 is a self-administered personality type evaluation

instrument, incorporating background and forced choice sections. The operational key is based upon analysis of the responses of enlisted men who met the minimum academic requirements for OCS. (2)

132. Officer Candidate Biographical Information Blank, OCB-3, FRT 735. 67-1 Key. This non operational key is based upon item analysis against officer efficiency report scores, using graduates of the branch 'mmaterial OCS (PR 3405).(21)

13ᵉ Biographical Information Blank, OCB-3, FRT 735. OCS-1 Key. This key was developed on the basis of studies in nine OCSs in PR 4061, during World War II, and had substantial validity for predicting leadership measures in the Signal OCS in PR 4-71-b. (23)

170. Composite selection score, operational. This score is an additive combination of the scores from variables 100, 110 and 130, and is a basis for selection for OCS. (4)

B Criteria

210. Final Platoon Leaders' Order of Merit Rankings. This is the final ranked leadership performance score assigned to candidates by the Tactical Officer during the week preceding graduation. (14)

211. First Platoon Leaders' Rankings. This is the rank on leadership performance assigned to the candidate by the Tactical Officer, after four or six weeks of training. (13)

220. Final Fellow Candidate Ranking. The last leadership evaluation obtained from the candidates themselves, derived from the average rank assigned the candidate by his associates. (12)

221. First Fellow Candidate Ranking. The average rank assigned the candidate by his associates, after four or six weeks of training. (11)

240. Composite Criterion Score. Twice variable 220, plus variable 210.[1] (2)

250. Final Academic Grade (10)

251. First Academic Grade (9)

280. Graduation-Attrition. This is the categorization of the candidates, as graduates, leadership failures, or failures for other reasons. The latter two categories are determined on the basis of leadership scores which the candidate received prior to relief or resignation. (15)

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[1] In a follow-up study under PR 34 5 it was found that these weights yielded the best prediction of Officer Efficiency Report DA AGO Form 67-1.

IV.   METHOD AND R. JULTS

A number of research questions were investigated during the course of the project. In the following description of methods, each research question will be posed in turn, and analysis and results pertinent to each will be presented.

A. What is the validity of the current operational selection instruments (OCB-3, OCE-2, OCI-4) in predicting leadership standing of graduates at officer candidate schools? To answer this question, product-moment correlations were computed between the predictor variables and a weighted composite criterion of final tactical officers ratings and student ratings (variable 24), separately for Field Artillery and Infantry OCS's.

Table 1.   Validities and intercorrelations of operational OCS leadership selection instruments against composite leadership scores (Var. 240) at Infantry OCS.

		240	100	130	N	Mean	Sigma
100	OCE (evaluation report)	.14			150	114.00	17.86
130	OCB (operational key)	-.01	.01		217	26.51	4.07
110	OCI (interview)	.15	.08	.16	217	28.58	7.64
240	Final Leadership rankings				217	83.26	39.25

Table 2.   Validities of operational OCS leadership selection instruments against composite leadership scores (Var. 240) at Field Artillery OCS*

		240	N	Mean	Sigma
100	OCE (evaluation report)	.15	46	109.56	17.37
130	OCB (operational key)	.04	68	26.59	4.22
110	OCI (interview)	.20	68	28.65	7.40

*Intercorrelations among predictors were not computed for this sample.

From Tables 1 and 2 it can be seen that there are no differences in predictive efficiency between schools, nor do the operational selection instruments present much evidence of useful validity for determining standing among graduates

B. Is this low validity in the current operational selection battery influenced by restriction in range? This question was raised particularly in view of the near-zero validity of the OCB-3. From an examination of the data, it was apparent that considerable attrition had occurred at both schools. If the selection instruments had little value in predicting the standings of the graduates alone, would they be more successful in distinguishing between graduates and non-graduates. The underlying assumption here is that the low validity coefficients resulted, in part, from restriction in range on the criterion. To investigate this question, the criterion was dichotomized into graduation vs. attrition for reasons of leadership failure. Biserial correlations between the selection instruments and the dichotomized criterion yielded improved prediction at the Infantry School, whereas in the Field Artillery sample, this criterion was unpredictable with the selection instruments. (See Table 3)

Table 3. Comparison of validities of OCS selection instruments: prediction of graduation standing (variable 240) vs. prediction of graduation-- leadership failure dichotomy (variable 280), in Infantry and Field Artillery OCSs .

		Infantry		Field Artillery	
		Graduation Standing (var. 240)	Graduation vs. Ldrsh. Failure (var. 280)	Graduation Standing (var. 240)	Graduation vs. Ldrsh. Failure (var. 280)
100	OCE	.14	.25	.15	.04
130	OCB-3	-.01	15	.04	.02
110	OCI	.18	.21	.20	.04
17.	Composite	.14	.26	.19	.04

N's: Infantry: 217 Graduates, 72 failures for variables 110 and 130
         150 Graduates, 50 failures for variables 1 0 and 170

Field Artillery: 68 Graduates, 57 failures for variables 110 and 130
         46 Graduates, 36 failures for variables 100 and 170

The failure to predict graduation-leadership attrition at the Field Artillery School may well have occurred as a result of (1) the small number of cases available, (2) the fact that most cases of attrition were listed in the original data as being resignations, (3) ratings used by the school may have been inappropriate or (4) the categorizing of "leadership failures" (based upon ratings) imposed by PRS technicians may have been inappropriate. In view of the first of these two considerations (i.e., small number of cases), it was felt that the Field Artillery data would not yield any more useful information and thus no further analyses were made of these data.

As a cross-check on the biserials, it was decided to compute product-moment correlations between the selection instruments and interim leadership criteria obtained in the 6th week of the course, at which time little attrition had taken place.

If prediction of interim criteria approached the prediction of graduation-attrition criteria, or represented an improvement over the prediction of graduate standing in leadership, it is hypothesized that the latter coefficients were probably affected by restriction on the criterion. Two of the 3 comparisons in Table 4 tend to support the hypothesis. It is felt that the approach presented here is preferable to that of using correction formulas to compensate for restriction in range, since the use of actual data is preferable to statistical corrections.

Table 4. Comparisons of validities of OCS selection instruments in predicting graduation standing, interim leadership standing, and graduation vs. leadership failure (Infantry OCS only).

		Graduation Standing (variable 24)	Interim Standing (var. 271)(var. 211)		Grad vs. Ldr. Fail. (variable 280)
1 0	OCS	.14	.20	.11	.25
130	OCB	-.01	.08	.04	.15
110	OCI	.18	.20	.26	.21
170	Composite	.14	--	--	.26

In this connection, the possibility of additional restriction in the selection variable must not be overlooked. Actually only those applicants who achieved a satisfactory score on the selection variable were permitted to attend OCS in the first place. This restriction could also have depressed the estimates of validity.

C. As another phase of the project, BIB scoring keys developed in previous OCS studies were applied to the OCB-3. The question posed here is "what are the comparative validities for various OCB-3 keys?" Here the approach was as before: validities of each key were computed separately against graduate standing, and also against the graduation vs. leadership-attrition criteria.

Table 5. Comparison of validities for 3 OCB-3 keys for predicting graduation standing and graduation vs. leadership failure (Infantry OCS)

		Graduation Standing var. 220 var. 210 var. 240			Graduation-Leadership Failure (var. 25_)
		Candidate Plat Ldr Weighted Ranking Ranking Composite			
13	OCB-3 operational	--	--	-.01	.1
132	OCB-3 67-1 key	.05	.08	--	.2?
13	OCB-3 OCS-1 key	.1?	.14	--	14

Examination of Table 5 indicates that the OCS-1 key is best of the 3 keys for predicting the graduation standing on leadership criteria. However, the 67-1 key has the highest validity in predicting graduation vs. leadership attrition (r_{bis} .22).

D. Of interest is the fact that the validity of the OCS-1 key is the same for predicting both graduation standing and the dichotomous criterion. This raises the question: Are the instruments equally effective throughout the criterion range? To answer this question, the sample was again dichotomized into graduates versus those who were relieved for leadership deficiencies, on the assumption that leadership failures would have had lower leadership ratings than the graduates. The ratio of graduates to leadership failures was 3 to 1. The original biserials, against graduates vs. leadership failures, represent a 25% cut. It was therefor decided to compute additional biserials at the 50% and 75% points of cut. For the 50% cut point, the lower $\frac{1}{2}$ of the graduates on variable 240 (composite leadership ranking) were grouped with the leadership failures; for the 75% cut point, the lower $\frac{2}{3}$ of graduates were grouped with the leadership failures. The resulting coefficients are presented in Table 6. (The 67-1 key was not used for the 50% and 75% points of cut).

Table 6. Validities of OCS selection instruments at Infantry OCS for different points of cut on the criterion (variable 250).

		25% cut	50% cut	75% cut
100	OCL	.2?	.17	.48
110	OCI	.21	.24	.26
130	OCB-3 (operational key)	.15	.10	.11
13?	OCB-3 (67-1 key)	.2?	---	---
13'	OCB-3 (OCS-1 key)	.14	.1?	.2?

From the data in Table 6, it appears that the OCI predicts more selectively at the low and high points of cut. It should be pointed out that the OCI was distributed bimodally in this sample. There is some indication that the OCI indicates greater selectivity at the high (7%) point of cut; however, the differences in validities at the cut points are not statistically significant. At best a trend can be discerned. This trend suggests the need for further research, with a more adequate sample, to determine at which level *the* interview is most effective.

The best point of cut evidenced by the OCB 3 operational key is at the 7% level, however, the validity of OCB-3 does not approach practical significance even at this point of cut. The OCS-1 key for OCB-3 shows a more definite trend toward better prediction at successively higher points of cut. It is apparent that the OCB-3 operational key and the OCB-1 key yield their best prediction at different criterion levels. These observations led to the initiation of TJ 7407-07, for the construction and validation of a combined key for OCB-3, and the validation of various selection composites involving the several OCB-3 keys.

b. While not directed at any particular research questions, other data were analyzed which may tend to round out the picture of the interrelationships of other predictors and criteria. These data are presented in Tables 7a, b, and c. In general they support the findings of the previous studies under TR 7405 (See Research Note 51-3).

V. SUMMARY AND CONCLUSIONS

The operational selection instruments (BIB, Evaluation Report, and Interview) were validated using the first classes from the new Infantry and Field Artillery Officer Candidate Schools. Prediction of graduate standing on leadership criteria was negligible for the BIB, and low for the Evaluation Report and Interview. In predicting graduation standing, no significant differences were found between the two schools. Two additional keys developed in previous programs were applied to the data, both yielding some improvement in validity.

To minimize the effect of restriction in the population range, the criterion for the Infantry OCS was dichotomized into graduates vs. leadership failures, this being a practical operational criterion. The selection instruments predicted this criterion more adequately than the criterion of leadership standing among the graduates. It is possible that the rankings of graduates provides an artificial differentiation between individuals, that is, that the graduate group is much more homogeneous than the rankings would indicate, thus limiting the predictability of this criterion, and providing further unmeasurable criterion restriction.

Intercorrelations among the selection instruments was practically zero, which would indicate that improvement of any of the instruments would result in a more effective battery.

- 9 -

Table 7. Intercorrelations of predictor and criterion measures (Infantry, OCS).

Table 7a

Description of Variable	Mean	Standard Deviation	Variable number	122	17?	110	221	??	211	210	17?
OCT	113.36	14.50	1?								
OCS-5 (operational Key)	26.08	4.26	120	.4	.16						
OCI	28.28	7.6?	110	.??	.8	.??					
1st Candidate Ranking	53.??	27.3?	221	(.14)	(.?1)	(.13)	.6?				
Final Candidate Ranking	55.4?	27.6	???	.11	.?4	.?6	.63	.7?			
First Platoon Leader	50.22	?.64	211	(.14)	(.01)	(.13)	--	.76	*6		
Final Platoon Leader	57.14	25.12	210	.?4	--	.?4	.1?	.?	.?1	.03	
OCS-5 67-1 Key	3.1?	7.17	15?	-.?7	.?7	.01	.18	.1?	.17	.14	.?6
OCS-3 OCS-1 Key	5?.?	11.5?	1?*								

Table 7b

	? OCS	OCT
OCT		
Final Academic Standing	.4?	.41

Table 7c

	?	1st Academic
	250	.74
Last Academic Standing	49.??	28.3?	?5.uot
First Candidate Ranking	53.5?	27.3?	.76
Final Candidate Ranking	65.4?	27.68	.27
Final Platoon Leader-Ranking	57.14	28.13	

Coefficients in parentheses were not computed separately against Variables ??? and ?1, they were computed against a composite criterion, ?(220)+?210.

- 1? -

Biserial correlations between predictor variables and different points of cut on the leadership criteria were computed to provide information as to the level at which each predictor was most effective. Results of this analysis led to a decision to combine several BIB keys in order to improve leadership prediction throughout the population range (RJ 7407-07).

Correlations were computed among academic predictors and academic criteria as a check on previous research findings. In general, these predictors were quite effective. Low positive relationships were found between leadership and academic criteria.

VI. PERSONNEL

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