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PREDICTION OF OCS GRADES AND FITNESS REPORT MARKS

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SUMMARY

A. Problem

This report describes research designed to improve two personnel decisions which the Navy must make relative to the input and output of Officer Candidate School (OCS). The first decision is made by the Administrative Board of Applications Review (ABAR), which considers all relevant applications data in deciding which men to accept and which to reject for entry into OCS. The second decision is made by the Officer Distribution Division of the Bureau of Naval Personnel, which must determine the best assignment for each man OCS graduates.

B. Background

Previous research has been concerned with the relationship between selection information and both OCS and officer performance. The relationship between OCS performance and officer performance has also been investigated. No attempts, however, have been made to convert previous research findings into a form for operational use in either selection or initial assignment.

C. Approach

Previously gathered research data were reanalyzed to permit evaluation of the validity of various combinations of OCS selection information. The purpose of the analysis was to improve prediction of future performance both at the time of selection to OCS and at the time of graduation. Multiple regression statistical procedures were used for the analyses.

D. Findings, Conclusions, and Recommendations

A combination of scores available at the time of selection resulted in usefully valid correlations with both OCS grades (page 5) and officer performance (page 6). A combination of final grades and selection scores available at the time of graduation from OCS resulted in quite encouraging correlations with officer performance (page 8). Tables are provided to demonstrate a method of using selection information in screening OCS applicants. At the time of selection, these tables enable prediction of OCS grades, fitness report marks at shore billets, and overall fitness report marks. At the time of graduation, when OCS grades are available, another set of tables provides even better prediction of fitness report marks at shore and fitness report marks at sea. The problem of determining the importance of various criteria such as OCS performance, on-job performance, and career retention is discussed.

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PREDICTION OF OCS GRADES AND FITNESS REPORT MARKS

A. PURPOSE

The Administrative Board of Applications Review (ABAR) of the Bureau of Naval Personnel reviews approximately 7,500 Officer Candidate School (OCS) applications yearly. The primary selection instrument employed in screening OCS applicants is the Officer Qualification Test (OQT). Applicants scoring above the OQT median are selected for further consideration, and their application forms are forwarded to ABAR for further review. This review includes the following information on each applicant: (1) OQT scores, (2) average college grades, (3) Inquiry Form ratings from character and employment references, and (4) personality ratings from two interviewing officers. Two additional selection criteria, physical examination information and local police checks, are also used. On the basis of the above information, a selection decision is made.[1]

Previous research has related the above selection information to both OCS performance (Rhea, 1966), and officer performance (Rhea, Rimland & Githens, 1964), and has related OCS performance to officer performance (Rhea, 1965). At the time of these studies, a systematic procedure for weighting selection information was not being used. Instead, the Board's judgment was based on a general assessment of each candidate. Recently the procedures for selecting OCS candidates were changed to include a systematic weighting of the selection instruments. The purpose of this report is to maximize the utilization of the information available for: (1) selection, and (2) initial assignment.

Specifically, the data gathered for the above mentioned studies were reanalyzed for the evaluation of combinations of OCS selection information to improve prediction of performance both at the time of selection to OCS and at the time of graduation. In addition, the Inquiry Form's overall "score" validity was compared with the validities of its subtotal scores. It was hypothesized that other combinations of the Inquiry Form scales would result in more effective predictions of the various criteria than would an average of the 13 scales. An analysis was also made of grades in the various OCS courses and their relationships to officer performance.

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[1]Early in 1968, scores on the Strong Vocational Interest Blank (SVIB) officer retention scale and a U. S. Navy Background Questionnaire (BQ) also became available.

It was hypothesized that an empirically derived combination of grades would be more effective than the currently derived Final Grade (FG) in predicting later officer performance.

B. BACKGROUND

Previous research data, upon which the present report is based, utilized the following subjects, predictors, and criteria.

1. Subjects

The officers used as subjects in validating the operational selection instruments were members of OCS Classes 34 through 36, and 39 through 41 (N = 2,262). They were commissioned in 1957 and 1958. All were college graduates recruited through the Offices of Naval Officer Recruitment.

2. Predictors

a. Officer Qualification Test (OQT). This test contains three sections: Verbal Analogies, Mechanical Comprehension, and Arithmetic Reasoning. These three parts are combined into a single score.

b. Average College Grades (ACG). The ACG score was derived in the following manner: 1 = a grade of D, or in the lower one-fourth of the graduating class; 2 = a grade of C, or in the third quarter of the graduating class; 3 = a grade of B, or in the second quarter of the graduating class, and 4 = a grade of A, or in the top one-fourth of the graduating class. Average college grades were used only if class standing was not available.

c. Personality Rating Score (PRS). This measure is the sum of the ratings assigned by two interviewing officers on the Interviewer's Appraisal Sheet (NavPers-958).

d. Quality Scores from Inquiry Form (QS-O). Each of the 13 scales was completed by raters whom the applicant had listed as reference sources at the time of his application [NavPers 1751 (Rev. 3-60)]. Raters included teachers, college deans, employers, and others who had personal contact with the applicant. Each applicant was rated by an average of nine raters, the number of raters ranging from 4 to 16. The overall score (QS-O) was obtained by averaging the 13 scales on each form and then obtaining an average score for each applicant across raters.

e. Written Comments (WC). On the Inquiry Form a space is provided for additional written comments or evaluations. To quantify these comments, they were rated by research personnel on a nine-point scale of favorableness of recommendation and averaged across raters.

3. Criteria

a. Final Grade (FG). This is an overall measure of the candidate's OCS performance. It is derived from the officially prescribed weights for each course listed below. These weights are in parentheses.

(1) Engineering (.1). Ship structure, machinery, and stability.

(2) Navigation (.2). Principles of piloting and celestial navigation.

(3) Operations (.2). Fleet maneuvers, tactics, and communications.

(4) Orientation and military justice (.1). Naval organization, administration, customs, and law.

(5) Seamanship (.1). Survey of various naval vessels and U. S. naval history.

(6) Naval weapons (.1). Naval ordnance, fire control problems, and their solutions.

(7) Military aptitude (.2). An overall evaluation of the candidate by OCS instructors. It may be considered more of a rating than a grade connected with a particular course.

b. Officer performance. Officer performance consisted of an average fitness mark abstracted from Officer Fitness Report Summaries [NavPers-1229 (Rev. 7-57)]. These fitness marks were those received by officers during the first 18 months of naval service and were based upon all fitness reports received at fleet duty stations (FR-F), and all reports received at shore duty stations (FR-S). An average of all fitness report marks (FR-T) includes marks on officers who had only shore experience, only fleet experience, or experience of both types.

4. Results of Earlier Studies

Table 1 summarizes the validities of the selection instruments used in predicting OCS and officer performance as presented in earlier reports.

a. Prediction of OCS grades. As seen in Table 1, the most valid single predictor of final grade was the candidate's OQT score (r = .50). It was concluded that no combination of two predictors increased validity by more than .03 or .04 correlation points and that little was gained by combining additional predictors (Rhea, 1966, p. 10). These increases, however, may be statistically significant. In the same report, it was noted that a combination of Quality scales 1 (Ability to make logical decisions), and 2 (Ability to originate and act upon ideas of his own) resulted in a higher validity coefficient with final grade than the QS-O score (.23 versus .14).

b. Prediction of officer performance. It was concluded that OQT scores had little practical validity in predicting fitness report marks (Rhea, Rimland & Githens, 1964, p. 11). Only the QS-O and Written Comments were concluded to have even minimal validity. However, the analysis did not combine any of the scores to predict officer performance. The report

TABLE 1

Validity of Operational Selection Scores Against OCS and Fitness Criteria

Predictor	OCS Final Grade (N=840)	Officer Performance		
		Fleet (N=1293)	Shore (N=1874)	Total (N=2183)
a. Officer Qualification Test (OQT)	.50	-.03	.14	.09
b. Average College Grades (ACG)	.22	.07	.14	.12
c. Personality Rating Score (PRS)	.10	.07	.07	.09
d. Quality Scores - Overall (QS-O)	.14	.21	.17	.23
e. Written Comments (WC)	.19	.12	.12	.15
f. Final Grade (FG)	--	.16	.37	.31

also noted that all of the 13 Inquiry Form scales were significantly correlated with the criteria. A weighted combination of these scales might be more effective in predicting officer performance than the overall score.

c. Validity of OCS school grades. Earlier research had found that grades in academic courses at OCS were not highly related to fitness report marks (LaGaipa, 1961; Rhea, 1965). LaGaipa obtained a multiple correlation of .27 between all of the course grades and Fleet Fitness Reports. Military Aptitude (MA) was the best single predictor of Fleet Fitness Report marks (r = .25). Rhea found somewhat better correlations between the various academic course grades and fitness report marks, but did not report any multiple correlations. Rhea, too, observed that MA was the best predictor of Fleet Fitness Report marks (r = .23). Rhea noted that academic course grades were consistently more highly related to Shore Fitness Report marks than to Fleet Fitness Report marks.

LaGaipa noted that his data offered some support for an increase in the relative weight of MA in deriving final grade. He suggested that technical knowledge (which was reflected in the academic grades received at OCS) played a lesser role in determining initial officer performance than other skills that the new officer might be called upon to exhibit immediately at fleet duty stations. These might be such skills as human relations, leadership, and personnel administration.

Military aptitude, which consisted of a composite of evaluations by OCS instructors, would appear to be related to these non-academic skills. If this were true, then demands upon technical skills may not be made until later in an officer's career.[2]

C. PROCEDURE

A matrix was constructed from data presented in the three earlier reports. The matrix contained the intercorrelations between the four criteria (FG, FR-F, FR-S, and FR-T), and all the selection scores, including QS-O as a single score. From this, seven multiple regression equations were computed. The first analysis used total scores from the five selection instruments to predict final grade. The next three analyses combined the same five total scores to predict separately each of the three officer performance criteria. The final three analyses combined final grade with the five overall selection scores to predict each of the three officer performance criteria. These final three analyses were done to determine whether a combination of selection scores and final grade provided more effective prediction of performance marks than final grade alone. In addition, this procedure enabled a prediction of officer performance to be made both at the time of selection and at the time of OCS graduation.

These results were compared to seven parallel analyses which included the 13 individual Inquiry Form scales rather than the overall average (QS-O). These comparisons were intended to ascertain whether the subtotal Inquiry Form scales would contribute more to the prediction of OCS grades or officer performance than QS-O.

Additionally, the validity of an empirically weighted combination of OCS grades was compared to the validity of the current judgmentally derived final grade.

Since the number of men tested was very large, these multiples were not corrected for shrinkage.

Prediction tables reporting and utilizing the optimal weighting of predictors were prepared.

D. RESULTS

1. Prediction of OCS Grades

With the exception of OQT scores, the validities of the predictors were not high. However, by combining all of the selection instruments,

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[2]To some degree, this might explain the low relationship found by Rhea between Fleet Fitness Report marks and Shore Fitness Report marks ($r = .15$). The same demands may not be placed on an officer in these two different kinds of job assignments.

a multiple correlation of .56 was obtained with final grade. This was significantly higher than the .50 correlation of OQT scores with final grade ($p < .01$). All of the selection instruments except Personality Rating Scores contributed toward the prediction of OCS grades.

It was noted in earlier reports that each of the 13 Inquiry Form scales correlated significantly with final grade. The question here is whether or not another combination of these scales is a more effective predictor of final grade than an average of the 13 scales.

It was found that a combination of Quality scales 1 (Ability to make logical decisions) and 11 (National loyalty) resulted in a multiple of .30 with final grade, an increase of .16 correlation points over the QS-O validity. This analysis, however, included only the individual Inquiry Form scales and none of the other selection scores. When other selection scores were combined with the individual Inquiry Form scales, there was no significant increase in validity over the QS-O score.

2. Prediction of Officer Performance

Predictions of officer performance may be made at the time of selection or upon OCS graduation. In this section, equations for both predictions are presented. In addition, predictions may be made by using QS-O selection scores or a weighted combination of Inquiry Form subscores in conjunction with the other prediction scores. Equations for both predictions are also given in this section.

a. Prediction of officer performance at the time of selection.

(1) Prediction by combining overall selection scores. At the time of selection, the most valid selection instrument for predicting fitness report marks was the QS-O score. These validities were .21, .17, and .23 with Fleet Fitness Report marks, Shore Fitness Report marks, and Total Fitness Report marks, respectively.

When OQT and ACG were combined with QS-O to predict Shore Fitness Report marks, validity was increased from .17 to .25 ($p < .01$). All five selection instruments contributed to a significantly increased correlation with Total Fitness Report marks. This correlation was increased from .23 to .28, an increase of .05 correlation points ($p < .01$). No significantly increased correlation was found, however, when the selection instruments were combined to predict Fleet Fitness Report marks. The only significant predictor of this criterion was the QS-O score ($r = .21$).

In summary, a combination of selection scores resulted in fairly encouraging correlations with officer performance at the time of selection. The best predictor was the QS-O score, which was somewhat surprising since very little information not highly favorable to the applicant was divulged. In general, combining additional selectors with the QS-O score significantly increased the relationship with officer performance.

(2) Prediction by combining individual Inquiry Form scores. Table 2 shows the validity of various combinations of the individual Quality scales as compared to the QS-O score above in predicting officer performance at the time of selection. This analysis included only the Inquiry Form scales and none of the other selection scores.

TABLE 2

Validity of Individual Quality Scales Versus QS-O Score in Predicting Fitness Report Criteria

	Officer Performance		
Predictor	Fleet (N=1293)	Shore (N=1874)	Total (N=2183)
QS-O	.21	.17	.23
Combination	.29	.20	.26
Increase	.08	.03	.03
p[a]	<.01	<.01	<.01

Notes --

[a]Significance of increase was determined between QS-O validity and R's based upon a combination of more than one individual Quality scale (McNemar, 1960, p. 279).

Combinations of the 13 scales resulted in significantly higher validities with all three criteria. This was particularly true for predicting Fleet Fitness Report marks. Six Quality scales contributed to an increase of .08 correlation points over the QS-O validity of .21. The most valid scales were 4 (Ability to lead others), 1 (Ability to make logical decisions), and 13 (Integrity). A combination of two Quality scales resulted in significantly higher validities with Shore Fitness Report marks. These were scales 2 (Ability to originate) and 8 (Attitude toward work). Scales 1 and 4 were better predictors of Total Fitness Report marks than the QS-O score.

When other selection scores were combined with the individual Inquiry Form scales, a weighted combination of subscores continued to be more valid than the QS-O score in predicting Fleet Fitness Report marks (R = .29 versus .21). This superiority did not hold up for predicting either Shore Fitness Report marks or Total Fitness Report marks.

In summary, various combinations of the individual scales were found to be more highly related to the criteria than an average of the 13 scales. When the 13 Inquiry Form scales were combined with other selection scores, however, this superiority held up only for predicting Fleet Fitness Report marks.

b. Prediction of officer performance at the time of graduation.

(1) Validity of overall scores. Upon OCS graduation, final grade was found to be the best predictor of Shore Fitness Report marks (r = .37) and Total Fitness Report marks (r = .31). Final grade correlated .16 with Fleet Fitness Report marks. As seen in Table 3, significant increases in the prediction of Fleet Fitness Report marks and Shore Fitness Report marks were found when QS-O scores were combined with final grade. The only selection instrument that significantly and consistently improved these validities was the QS-O score. It should be noted that final grade receives a much higher weight in predicting Shore Fitness Report marks than in predicting Fleet Fitness Report marks.

TABLE 3

Validities of Selection Instruments and Final OCS Grades Against Fitness Report Criteria

	Officer Performance		
Predictor	Fleet (N=1293)	Shore (N=1874)	Total (N=2183)
Final OCS Grade	.16	.37	.31
Final OCS Grade + QS-O	.25	.39	.36
Increase	.09	.02	.05
p[a]	<.01	<.01	<.01

Notes --

[a]Significance of increase was determined between Final OCS Grade validity and R's based upon a combination of Final Grade and Selection Instrument scores (McNemar, 1960, p. 279).

In summary, when final grade and scores on the various selection instruments were combined, only the QS-O score consistently improved the prediction of officer performance. These multiples were significantly greater than those obtained using final grade alone. This was particularly true in predicting Fleet Fitness Report marks.

(2) Validity of individual Inquiry Form scores. The question here is whether an optimally weighted combination of Inquiry Form scales is a more effective predictor of officer performance at the time of graduation than the QS-O score alone. In these analyses, the 13 Quality scales were combined with both the other selection instrument scores and final grade to predict performance. The QS-O score was not included in these analyses.

The results indicated that a combination of the 13 scales and other selection predictors were more effective than QS-O and the same selection predictors in predicting Fleet Fitness Report marks. The multiple for Fleet Fitness Report marks was increased from .27 to .31 ($p < .01$). The valid scales were 4 (Ability to lead others), 5 (Degree of cooperation with others), and 13 (Integrity). No significant difference was obtained, however, when combinations of the individual scales rather than QS-O were used to predict Shore Fitness Report marks or Total Fitness Report marks.

(3) Validity of individual OCS school grades. If the various OCS courses were differentially related to officer performance, it might be useful to assign empirically derived weights to the various courses. These would replace the present weights, which are based on judged relationships between the grades and performance.

The analysis indicated that when the various school grades were combined, military aptitude was the best predictor of Fleet Fitness Report marks and was almost as effective a predictor of Total Fitness Report marks as was final grade. Table 4 compares the validity of final grade with optimal combinations of OCS grades.

An empirically derived combination of grades was significantly more effective than the currently used final grade in predicting Fleet Fitness Report marks and Total Fitness Report marks. The results indicated that to increase the relationship between OCS grades and performance during the first 18 months of naval service, military aptitude should have somewhat more weight in the final grade composite than it currently does, and that grades in operations and naval weapons should have somewhat less weight. An additional consideration is that statistically the "actual weight" of each grade depends on the share it contributes to the total variance of final grade. Although navigation, operations, and military aptitude each receive an official weight of .2, because of its smaller variability, military aptitude in effect receives less weight in deriving final grade than the other two courses.

TABLE 4

Validity of Overall Final Grade Versus Validity of Empirical Combination of OCS Grades in Predicting Fitness Report Criteria

	Officer Performance		
Predictor	Fleet (N=1293)	Shore (N=1874)	Total (N=2183)
Final Grade	.16	.37	.31
Empirical Combination of OCS Grades	.27	.37	.36
Increase	.11	--	.05
p[a]	<.01	--	<.01

Notes --

[a]Significance of increase was determined between final grade validity and $\bar{R}$'s based upon a combination of OCS grades (McNemar, 1960, p. 279).

In general, however, the degree of correspondence between the official weights assigned and their relative contribution to later job performance appears, with the exception of military aptitude, not to be seriously in need of revision. With reference to predicting Shore Fitness Report marks, it was noted that the final grade was as effective as any empirical combination of OCS course grades.

Tables 5-9 employ optimal regression weights for predicting OCS grades and officer performance at fleet and shore duty stations. Officer performance is predicted both at the time of selection and at the time of OCS graduation. The tables are presented in order to demonstrate a systematic method of efficiently utilizing available predictor information.[3]

[3]In constructing the tables, a predicted criterion score was computed for each combination of predictors. These scores were then converted, for simplified use, to a ten-point scale. These index numbers constitute the entries in the tables.

TABLE 5

Predicted Final OCS Grades at the Time of Selection Using Quality Score-Overall (QS-O), Average College Grades (ACG), and Officer Qualification Test (OQT) Scores

OQT	QS-O	ACG							
		1.0 to 1.3	1.4 to 1.7	1.8 to 2.1	2.2 to 2.5	2.6 to 2.9	3.0 to 3.3	3.4 to 3.7	3.8 or higher
50-51	4.0 (or less)	1	1	1	2	2	2	2	2
	4.1-4.2	1	2	2	2	2	2	3	3
	4.3-4.4	2	2	2	2	3	3	3	3
	4.5-4.6	2	2	3	3	3	3	4	4
	4.7-4.8	2	3	3	3	4	4	4	4
	4.9 (or higher)	3	3	3	4	4	4	5	5
52-53	4.0 (or less)	2	2	2	2	2	3	3	3
	4.1-4.2	2	2	2	3	3	3	4	4
	4.3-4.4	2	3	3	3	3	4	4	4
	4.5-4.6	3	3	3	4	4	4	4	5
	4.7-4.8	3	4	4	4	4	5	5	5
	4.9 (or higher)	4	4	4	5	5	5	5	6
54-55	4.0 (or less)	2	2	3	3	3	4	4	4
	4.1-4.2	3	3	3	4	4	4	4	5
	4.3-4.4	3	3	4	4	4	5	5	5
	4.5-4.6	4	4	4	5	5	5	5	6
	4.7-4.8	4	4	5	5	5	6	6	6
	4.9 (or higher)	5	5	5	6	6	6	6	6
56-57	4.0 (or less)	3	3	4	4	4	4	5	5
	4.1-4.2	4	4	4	4	5	5	5	6
	4.3-4.4	4	4	5	5	5	5	6	6
	4.5-4.6	5	5	5	5	6	6	6	6
	4.7-4.8	5	5	6	6	6	6	6	7
	4.9 (or higher)	6	6	6	6	6	7	7	7
58-59	4.0 (or less)	4	4	4	5	5	5	6	6
	4.1-4.2	4	5	5	5	6	6	6	6
	4.3-4.4	5	5	5	6	6	6	6	7
	4.5-4.6	5	6	6	6	6	6	7	7
	4.7-4.8	6	6	6	6	7	7	7	8
	4.9 (or higher)	6	6	7	7	7	7	8	8
60-61	4.0 (or less)	5	5	5	6	6	6	6	6
	4.1-4.2	5	6	6	6	6	6	7	7
	4.3-4.4	6	6	6	6	7	7	7	7
	4.5-4.6	6	6	7	7	7	7	8	8
	4.7-4.8	6	7	7	7	8	8	8	8
	4.9 (or higher)	7	7	7	8	8	8	9	9
62-63	4.0 (or less)	6	6	6	6	6	7	7	7
	4.1-4.2	6	6	6	7	7	7	8	8
	4.3-4.4	6	7	7	7	7	8	8	8
	4.5-4.6	7	7	7	8	8	8	8	9
	4.7-4.8	7	8	8	8	8	9	9	9
	4.9 (or higher)	8	8	8	9	9	9	9	9
64 (or higher)	4.0 (or less)	6	6	7	7	7	8	8	8
	4.1-4.2	7	7	7	8	8	8	8	9
	4.3-4.4	7	7	8	8	8	9	9	9
	4.5-4.6	8	8	8	9	9	9	9	9
	4.7-4.8	8	8	9	9	9	9	10	10
	4.9 (or higher)	9	9	9	9	9	10	10	10

Note --

The regression weights used to construct this table were: QS-O (.074) + ACG (.021) + OQT (.013) + 2.061. This provided a multiple correlation of .56.

TABLE 6

Predicted Fleet Performance Ratings at the Time of Graduation
Using Quality Score-Overall (QS-O) and
Final OCS Grades (FG)

QS-O	Final Grade							
	2.66 to 2.75	2.76 to 2.85	2.86 to 2.95	2.96 to 3.05	3.06 to 3.15	3.16 to 3.25	3.26 to 3.35	3.36 to 3.45
4.0 (or less)	1	1	2	2	3	4	4	5
4.1-4.2	2	3	3	4	4	5	6	6
4.3-4.4	3	4	5	5	6	6	7	8
4.5-4.6	5	5	6	7	7	8	8	9
4.7-4.8	6	7	7	8	9	9	10	10
4.9 (or higher)	8	8	9	9	10	10	10	10

Note --

The regression weights used to construct this table were: QS-O (1.061) + FG (.903) + .025. This provided a multiple correlation of .25.

TABLE 7

Predicted Shore Performance Ratings at the Time of Selection Using Quality Score-Overall (QS-O), Average College Grades (ACG), and Officer Qualification Test (OQT) Scores

OQT	QS-O	ACG							
		1.0 to 1.3	1.4 to 1.7	1.8 to 2.1	2.2 to 2.5	2.6 to 2.9	3.0 to 3.3	3.4 to 3.7	3.8 or higher
50-51	4.0 (or less)	1	1	2	2	2	2	2	2
	4.1-4.2	2	2	2	2	3	3	3	4
	4.3-4.4	3	3	4	4	4	4	4	4
	4.5-4.6	4	4	4	4	5	5	5	6
	4.7-4.8	5	5	6	6	6	7	7	7
	4.9 (or higher)	6	7	7	7	7	7	7	8
52-53	4.0 (or less)	1	2	2	2	2	2	2	3
	4.1-4.2	2	2	2	3	3	3	4	4
	4.3-4.4	3	4	4	4	4	4	4	5
	4.5-4.6	4	4	4	5	5	5	6	6
	4.7-4.8	5	6	6	6	7	7	7	7
	4.9 (or higher)	7	7	7	7	7	7	8	8
54-55	4.0 (or less)	2	2	2	2	2	2	3	3
	4.1-4.2	2	3	3	3	4	4	4	4
	4.3-4.4	4	4	4	4	4	4	5	5
	4.5-4.6	4	5	5	5	6	6	6	7
	4.7-4.8	6	6	6	7	7	7	7	7
	4.9 (or higher)	7	7	7	7	8	8	8	9
56-57	4.0 (or less)	2	2	2	2	2	3	3	3
	4.1-4.2	3	3	3	4	4	4	4	4
	4.3-4.4	4	4	4	4	4	5	5	5
	4.5-4.6	5	5	5	6	6	6	7	7
	4.7-4.8	6	6	7	7	7	7	7	7
	4.9 (or higher)	7	7	7	8	8	8	9	9
58-59	4.0 (or less)	2	2	2	3	3	3	4	4
	4.1-4.2	3	3	4	4	4	4	4	4
	4.3-4.4	4	4	4	5	5	5	6	6
	4.5-4.6	5	5	6	6	6	7	7	7
	4.7-4.8	7	7	7	7	7	7	8	8
	4.9 (or higher)	7	7	8	8	8	9	9	9
60-61	4.0 (or less)	2	2	3	3	3	4	4	4
	4.1-4.2	3	4	4	4	4	4	4	5
	4.3-4.4	4	4	5	5	5	6	6	6
	4.5-4.6	5	6	6	6	7	7	7	7
	4.7-4.8	7	7	7	7	7	8	8	8
	4.9 (or higher)	7	8	8	8	9	9	9	9
62-63	4.0 (or less)	2	3	3	3	4	4	4	4
	4.1-4.2	4	4	4	4	4	5	5	5
	4.3-4.4	4	5	5	5	6	6	6	7
	4.5-4.6	6	6	7	7	7	7	7	7
	4.7-4.8	7	7	7	7	8	8	8	9
	4.9 (or higher)	8	8	9	9	9	9	9	9
64 (or higher)	4.0 (or less)	3	3	3	4	4	4	4	4
	4.1-4.2	4	4	4	4	5	5	5	6
	4.3-4.4	5	5	5	6	6	6	7	7
	4.5-4.6	6	7	7	7	7	7	7	8
	4.7-4.8	7	7	7	8	8	8	9	9
	4.9 (or higher)	8	9	9	9	9	9	9	10

Note --

The regression weights used to construct this table were: QS-O (.749) + ACG (.083) + OQT (.021) + 3.170. This provided a multiple correlation of .25.

TABLE 8

Predicted Shore Performance Ratings at the Time of Graduation Using Quality Score-Overall (QS-O) and Final OCS Grades (FG)

QS-O	Final Grade							
	2.66 to 2.75	2.76 to 2.85	2.86 to 2.95	2.96 to 3.05	3.06 to 3.15	3.16 to 3.25	3.26 to 3.35	3.36 to 3.45
4.0 (or less)	1	1	2	3	4	5	6	7
4.1-4.2	1	2	3	4	5	6	7	8
4.3-4.4	1	2	3	4	5	6	7	9
4.5-4.6	2	3	4	5	6	7	8	9
4.7-4.8	3	4	5	6	7	8	9	10
4.9 (or higher)	3	4	5	6	7	8	9	10

Note --

The regression weights used to construct this table were: QS-O (.570) + FG (2.040) - 1.094. This provided a multiple correlation of .39.

TABLE 9

Predicted Total Performance Ratings at the Time of Selection Using Quality Score-Overall (QS-O), Average College Grades (ACG), and Officer Qualification Test (OQT) Scores

OQT	QS-O	ACG 1.0 to 1.3	1.4 to 1.7	1.8 to 2.1	2.2 to 2.5	2.6 to 2.9	3.0 to 3.3	3.4 to 3.7	3.8 or higher
50-51	4.0 (or less)	1	1	1	1	1	1	2	2
	4.1-4.2	2	2	2	3	3	3	3	3
	4.3-4.4	3	4	4	4	4	4	5	5
	4.5-4.6	5	5	5	5	6	6	6	6
	4.7-4.8	6	7	7	7	7	7	7	8
	4.9 (or higher)	8	8	8	8	9	9	9	9
52-53	4.0 (or less)	1	1	1	1	1	2	2	2
	4.1-4.2	2	2	3	3	3	3	3	3
	4.3-4.4	4	4	4	4	4	5	5	5
	4.5-4.6	5	5	5	6	6	6	6	6
	4.7-4.8	7	7	7	7	7	8	8	8
	4.9 (or higher)	8	8	8	9	9	9	9	9
54-55	4.0 (or less)	1	1	9	1	2	2	2	2
	4.1-4.2	2	3	3	3	3	3	3	4
	4.3-4.4	4	4	4	4	5	5	5	5
	4.5-4.6	5	6	6	6	6	6	6	7
	4.7-4.8	7	7	7	7	8	8	8	8
	4.9 (or higher)	8	8	9	9	9	9	9	10
56-57	4.0 (or less)	1	1	1	2	2	2	2	2
	4.1-4.2	3	3	3	3	3	3	4	4
	4.3-4.4	4	4	4	5	5	5	5	5
	4.5-4.6	6	6	6	6	6	6	7	7
	4.7-4.8	7	7	7	8	8	8	8	8
	4.9 (or higher)	8	9	9	9	9	9	10	10
58-59	4.0 (or less)	1	1	2	2	2	2	2	2
	4.1-4.2	3	3	3	3	3	4	4	4
	4.3-4.4	4	4	5	5	5	5	5	5
	4.5-4.6	6	6	6	6	6	7	7	7
	4.7-4.8	7	7	8	8	8	8	8	8
	4.9 (or higher)	9	9	9	9	9	10	10	10
60-61	4.0 (or less)	1	2	2	2	2	2	3	3
	4.1-4.2	3	3	3	3	4	4	4	4
	4.3-4.4	4	5	5	5	5	5	6	6
	4.5-4.6	6	6	6	6	7	7	7	7
	4.7-4.8	7	8	8	8	8	8	9	9
	4.9 (or higher)	9	9	9	9	10	10	10	0
62-63	4.0 (or less)	2	2	2	2	2	3	3	3
	4.1-4.2	3	3	4	4	4	4	4	4
	4.3-4.4	5	5	5	5	5	6	6	6
	4.5-4.6	6	6	6	7	7	7	7	7
	4.7-4.8	8	8	8	8	8	9	9	9
	4.9 (or higher)	9	9	9	10	10	10	10	10
64 (or higher)	4.0 (or less)	2	2	2	2	3	3	3	3
	4.1-4.2	3	4	4	4	4	4	4	5
	4.3-4.4	5	5	5	5	6	6	6	6
	4.5-4.6	6	6	7	7	7	7	7	8
	4.7-4.8	8	8	8	8	9	9	9	9
	4.9 (or higher)	9	9	10	10	10	10	10	10

Note --

The regression weights used to construct this table were: QS-O (1.005) ACG (.059) + OQT (.014) + 2.428. This provided a multiple correlation of .26.

E. CONCLUSIONS AND RECOMMENDATIONS

At the time of the original studies, the OQT cutting score was considerably lower (42 instead of 55). Therefore, these weights are based upon a sample which was not as restricted in range. More appropriate weights for use in screening current OCS candidates could be developed from more current data.

In the near future, the selection instruments considered in this report should be analyzed in conjunction with Strong Vocational Interest Blank (SVIB) and Background Questionnaire (BQ) selection scores. In addition, the ability of these instruments to predict career potential could be ascertained when retention criteria for OCS graduates becomes available.

Since techniques have now been developed to predict OCS performance, fleet performance, shore performance, and soon information will be available on predicting career retention, decisions on certain personnel policies are now called for. Specifically, what is the relative importance of career potential, OCS performance, fleet performance, and shore performance. Decisions as to the relative importance of each are needed in order to systematically derive the overall desirability of an individual for either OCS selection or initial officer assignments.

1. Prediction of OCS Grades

With the exception of Personality Rating Scores, the results indicated that all of the selection instruments contributed significantly toward the prediction of OCS grades. In terms of effectively using the selection information, most of the weight should be placed upon OQT scores; other scores should receive some weight, and Personality Rating Scores should receive no weight. Table 5 shows the index numbers which reflect predicted final grades when this weighting system is used. Since Written Comment scores are not normally computed, this variable was omitted from the computations.

2. Prediction of Officer Performance

a. Fleet performance. The only valid predictor of fleet performance at the time of selection was the QS-O score. Other selection instruments had no practical validity.

When OCS grades are known, the best prediction of fleet performance may be made from a combination of QS-O and final grade. Other selection scores showed no useful validity and should receive no weight. Table 6 shows the index numbers which reflect predicted Fleet Fitness Report marks at the time of graduation.

A combination of certain individual Inquiry Form scales resulted in higher validity with fleet performance. It is recommended that particular attention be paid to these specific scales.

b. Shore performance. The best predictor of shore performance at the time of selection was the overall Inquiry Form score. Prediction was improved when OQT and Average College Grade scores were combined with QS-O, and it is recommended that these scores receive some weight. The other two selection scores did not improve prediction and should receive no weight. Table 7 shows the index numbers which reflect predicted Shore Fitness Report marks at the time of selection.

When OCS grades are known, the best prediction of shore performance was made from a combination of final grade and QS-O score. Other selection scores showed no useful validity and should receive no weight. Table 8 shows the index numbers which reflect predicted Shore Fitness Report marks at the time of graduation.

c. Total performance. Although all five selection scores contributed to the prediction of Total Fitness Report marks, a combination of QS-O, OQT, and Average College Grades yielded a multiple that was not substantially lower than that obtained using all of the selection scores. Table 9 shows the index numbers which reflect predicted Total Fitness Report marks at the time of selection.

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13 ABSTRACT This report describes research designed to improve two personnel decisions which the Navy must make relative to the input and output of Officer Candidate School (OCS). The first decision is made by the Administrative Board of Applications Review (ABAR), which considers all relevant applications data in deciding which men to accept and which to reject for entry into OCS. The second decision is made by the Officer Distribution Division of the Bureau of Naval Personnel, which must determine the best assignment for each man OCS graduates.

Previously gathered research data were reanalyzed to permit evaluation of the validity of various combinations of OCS selection information. The purpose of the analysis was to improve prediction of future performance both at the time of selection to OCS and at the time of graduation. Multiple regression statistical procedures were used for the analyses.

A combination of scores available at the time of selection resulted in usefully valid correlations with both OCS grades and officer performance. A combination of final grades and selection scores available at the time of graduation from OCS resulted in quite encouraging correlations with officer performance. Tables are provided to demonstrate a method of using selection information in screening OCS applicants. At the time of selection, these tables enable prediction of OCS grades, fitness report marks at shore billets, and overall fitness report marks. At the time of graduation, when OCS grades are available, another set of tables provides even better prediction of fitness report marks at shore and fitness report marks at sea. The problem of determining the importance of various criteria such as OCS performance, on-job performance, and career retention is discussed.

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Officer Qualification Test						
Assignment						
OCS Grades						
OCS Selection						
Officer						
Prediction						
Performance						
Tests						
College Grades						