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## THE EFFECTS OF CORRECTING EARLY FITNESS REPORTS FOR SITUATIONAL FACTORS

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AN ACTIVITY OF THE BUREAU OF NAVAL PERSONNEL

THE EFFECTS OF CORRECTING EARLY FITNESS REPORTS  
FOR SITUATIONAL FACTORS

by

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## BRIEF

The major purpose of this investigation was to determine the need for making statistical corrections to the fitness reports of junior officers to adjust for possible inequalities due to extraneous situational factors. The situational influences for which corrections were made were (a) type of duty stations at which reports were made, (b) number of reports (up to 5) the officer had received, (c) rater familiarity with the junior officer, as measured by the number of successive reports completed by the same rater.

The analysis was conducted on the reports received during the first 18 months of active duty of 1,338 members of the NROTC graduating Class of 1959. The sample was fractionated into groups homogeneous with regard to the variables being studied. Standard scores were computed for each subgroup, and these were compared with raw, unstandardized average fitness scores for the total group.

Although significant differences in fitness ratings were attributable to factors (a) and (b) above, a correlation of .97 was found between the standardized (corrected) scores and the raw, unstandardized scores, thus indicating the influence of the variables corrected for to be practically negligible. An additional finding was that correlations of about .90 among the four scales on the Fitness Report Summary Sheet permit these four scales to be averaged without significant loss of information.

Although conducted in the process of developing a means for using early fitness reports as a research criterion, the findings of this study are encouraging in that they suggest the fitness report to be relatively uninfluenced by extraneous factors as used operationally.

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## THE EFFECTS OF CORRECTING EARLY FITNESS REPORTS FOR SITUATIONAL FACTORS

### A. PURPOSE

The primary purpose of this study is to determine if corrections are needed to compensate for the degree to which certain extraneous factors influence fitness report marks. Examples of such extraneous factors are: number of fitness reports received, number of fitness reports received from the same rater, and type of duty station at which ratings were received. Should the effects of these extraneous factors be found to be significant, they should be appropriately compensated for when fitness marks are being used operationally in making administrative decisions concerning naval officers.

The development of a single summary type score to reflect fitness marks in general is a secondary purpose of this study. A single score to represent an overall evaluation of an officer's performance is frequently needed.

### B. POPULATION

The population of this study consists of the 1,338 graduates of these NROTC programs who were commissioned as Ensigns during the calendar year 1959. Of these there were 804 Regular and 534 Contract students.

### C. DATA

An Officer Summary Record (NAVPERS 1269 Rev. 7-57) was obtained for each officer in the population. These records include the following information abstracted from each fitness report completed for the officer during his first 18-month period of active service:<sup>1</sup>

Location and type of duty

Name of reporting senior

Rank of reporting senior

Rating score for Item 14a, "Present assignment"

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<sup>1</sup>The fitness form used during this investigation was NAVPERS 310 Rev. 3-54 "Report on the Fitness of Officers," a copy of which is shown in Appendix A.

Rating score for Item 15, "Considering the possible requirements of war, indicate your attitude toward having this officer under your command"

Rating score for Item 16a, "In comparison with other officers of his grade and approximate length of service, how would you designate this officer?"

Rating score for Item 19, a summary score giving equal weight to the following six qualities: "Professional knowledge, cooperation, judgement, leadership, promotion potential, and management effectiveness"

#### D. PROCEDURE

The above fitness report information contained in the Officer Summary Record for each officer was coded as follows:

##### 1. Report Number

The fitness reports received by each officer were assigned a chronological number; the first report received was assigned a one, the second a two, etc., to a maximum total of five reports. Many officers in the sample had less than five fitness reports available.

##### 2. Rater Familiarity

The first fitness report submitted on a particular officer by a reporting senior was assigned a one, the second by the same rater was assigned a two, etc.

##### 3. Type of Duty Station

After discussion with a number of officers, the following scheme for categorizing duty types was selected as being most consonant with the purposes of this investigation:

- A. Large Combat Vessel
- B. Small Combat Vessel
- C. Non-Combat Vessel
- D. Shore Duty in U.S.
- E. Shore Duty Outside U.S.
- F. Duty Under Instruction

##### 4. Actual Performance Ratings

These were the rating scores obtained from the fitness reports, see Appendix A:

- a. Present assignment ( $X_a$ ) (Item 14a)
- b. Desirability ( $X_b$ ) (Item 15)
- c. Comparison ( $X_c$ ) (Item 16a)
- d. Quality ( $X_d$ ) (Item 19)

The numerical weight for each scale value has been typewritten on the form in the appendix. The Quality Rating is represented by an average of all the sub-scales included as part of Item 19.

Since it was felt that the index derived should reflect actual on-the-job performance and not academic ability, reports completed while on "Duty under Instruction" were eliminated from the analysis.

Four scores were then computed as follows:

1. Average Raw Score. The average (across all fitness reports) for each of the four rating scores above were computed for each officer:

$$\bar{X}_a, \bar{X}_b, \bar{X}_c, \bar{X}_d.$$

2. Summary Average Raw Score. This consists of the mean of the four Average Raw Scores for each officer:

$$\bar{X}_{a \rightarrow d} = (\bar{X}_a + \bar{X}_b + \bar{X}_c + \bar{X}_d) / 4.$$

3. Average Standard Score. In order to obtain a measure in which the influence of report number, rater familiarity, and type of duty station have been statistically removed, standard scores were computed as follows. All fitness reports analyzed in this study were grouped so that within each group the fitness reports were identical with respect to report number, rater familiarity, and type of duty station. Within each of these groups the raw scores were then converted to standard scores with a mean of 50 and a standard deviation of 10:  $Z_a, Z_b, Z_c, Z_d$ .

The average of the standard scores for each of the four ratings analyzed in this study was computed for each officer:  $\bar{Z}_a, \bar{Z}_b, \bar{Z}_c, \bar{Z}_d$ . The number of reports on which the average was based ranged from 1 to 5.

4. Summary Average Standard Score. This consists of the mean of the four Average Standard Scores for each officer:

$$\bar{Z}_{a \rightarrow d} = (\bar{Z}_a + \bar{Z}_b + \bar{Z}_c + \bar{Z}_d) / 4.$$

Means were computed for fitness report marks associated with each of the "Type of Duty Station" categories, significance tests were applied to differences between means, and correlations were computed between the various scores.

## E. RESULTS

### 1. Means

Tables 1, 2, and 3 show the mean raw scores of the population categorized in various ways.

As indicated by the means in Table 1, the fitness report marks were skewed toward the positive end of each rating scale (the positive end of the scale was coded 0, and the negative end of the scale was coded 10). This is consistent with the frequently reported skewness of military performance ratings.

Table 1 also shows that there is more variance (reflected by the standard deviations) associated with the "Desirability" scale than with the other scales. The mean fitness scores obtained while on "U.S. Shore Duty," were more favorable (numerically lower) than the corresponding mean scores of other stations. With one exception, the mean scores for "Small Combat Vessel" were less favorable (numerically higher) than the corresponding mean scores of other stations.

Table 2 shows the results of significance tests applied to the differences among the means shown in Table 1. "Shore Duty in U.S." is significantly better than the other types of duty station. The only other significant difference found was between "Large Combat Vessel" and "Small Combat Vessel," ratings from the former being more favorable (lower numerically).

Table 3 presents the ratings on "Present Assignment" categorized in terms of the situational variable being investigated. The previously noted tendency for first fitness scores given at "U.S. Shore Duty" and on "Small Combat Vessel" to be better and poorer, respectively, than reports given at other stations is herein shown<sup>2</sup> to also hold for later fitness reports. A general tendency for mean fitness scores to improve

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<sup>2</sup>Columns  $\bar{X}_D$  and  $\bar{X}_B$  compared to Columns  $\bar{X}_A$  and  $\bar{X}_C$  and  $\bar{X}_E$ .

TABLE 1

Rating Means, Standard Deviations and N's for Groups  
By Type of Duty Station on First Fitness Report

| Type of<br>Duty Station    | Rating a<br>(Present Assignment) |             |      | Rating b<br>(Desirability) |             |      | Rating c<br>(Comparability) |             |      | Rating d<br>(Qualities) |             |      |
|----------------------------|----------------------------------|-------------|------|----------------------------|-------------|------|-----------------------------|-------------|------|-------------------------|-------------|------|
|                            | <u>N</u>                         | $\bar{X}_a$ | SD   | <u>N</u>                   | $\bar{X}_b$ | SD   | <u>N</u>                    | $\bar{X}_c$ | SD   | <u>N</u>                | $\bar{X}_d$ | SD   |
| A. Large Combat Vessel     | 348                              | 2.82        | 1.39 | 348                        | 2.57        | 1.72 | 348                         | 3.05        | 1.45 | 335                     | 3.10        | 1.24 |
| B. Small Combat Vessel     | 365                              | 3.09        | 1.41 | 366                        | 2.90        | 1.67 | 366                         | 3.33        | 1.36 | 354                     | 3.28        | 1.17 |
| C. Non-Combat Vessel       | 42                               | 2.88        | 1.21 | 42                         | 2.57        | 1.55 | 42                          | 3.19        | 1.17 | 40                      | 3.03        | 1.10 |
| D. Shore Duty in U.S.      | 225                              | 2.41        | 1.14 | 225                        | 2.18        | 1.42 | 221                         | 2.65        | 1.08 | 215                     | 2.60        | 1.04 |
| E. Shore Duty outside U.S. | 33                               | 2.94        | 1.14 | 33                         | 2.91        | 1.51 | 33                          | 3.15        | 1.23 | 32                      | 3.06        | 1.05 |

TABLE 2

Significance Levels of Differences Between Duty Stations  
In Mean Ratings on First Fitness Report  
(t-tests)

| Duty Station               | Rating a<br>(Present Assignment) |     |      |     | Rating b<br>(Desirability) |     |      |     | Rating c<br>(Comparability) |     |      |     | Rating d<br>(Qualities) |     |      |     |
|----------------------------|----------------------------------|-----|------|-----|----------------------------|-----|------|-----|-----------------------------|-----|------|-----|-------------------------|-----|------|-----|
|                            | B                                | C   | D    | E   | B                          | C   | D    | E   | B                           | C   | D    | E   | B                       | C   | D    | E   |
| A. Large Combat Vessel     | .02                              | NS  | .005 | NS  | .01                        | NS  | .005 | NS  | .01                         | NS  | .005 | NS  | .10                     | NS  | .005 | NS  |
| B. Small Combat Vessel     | (-)                              | NS  | .005 | NS  | (-)                        | NS  | .005 | NS  | (-)                         | NS  | .005 | NS  | (-)                     | NS  | .005 | NS  |
| C. Non-Combat Vessel       |                                  | (-) | .05  | NS  |                            | (-) | NS   | NS  |                             | (-) | .01  | NS  |                         | (-) | .05  | NS  |
| D. Shore Duty in U.S.      |                                  |     | (-)  | .02 |                            |     | (-)  | .01 |                             |     | (-)  | .05 |                         |     | (-)  | .05 |
| E. Shore Duty outside U.S. |                                  |     |      | (-) |                            |     |      | (-) |                             |     |      | (-) |                         |     |      | (-) |

Note.--

NS = not significant

TABLE 3

Fitness Scale "a" (Present Assignment) Means, Standard Deviations, and N's for Groups  
By Report Number, Duty Station, and Number of Reports by Same Rater

| Fitness<br>Report<br>Number* | Report<br>By Same<br>Rater** | A. Large Combat<br>Vessel |      |     | B. Small Combat<br>Vessel |      |     | C. Non-Combat<br>Vessel |      |    | D. Shore Duty<br>in U. S. |      |     | E. Shore Duty<br>outside U.S. |      |    |
|------------------------------|------------------------------|---------------------------|------|-----|---------------------------|------|-----|-------------------------|------|----|---------------------------|------|-----|-------------------------------|------|----|
|                              |                              | $\bar{X}_A$               | SD   | N   | $\bar{X}_B$               | SD   | N   | $\bar{X}_C$             | SD   | N  | $\bar{X}_D$               | SD   | N   | $\bar{X}_E$                   | SD   | N  |
| I                            | 1                            | 2.82                      | 1.39 | 348 | 3.09                      | 1.41 | 365 | 2.88                    | 1.21 | 42 | 2.41                      | 1.14 | 225 | 2.94                          | 1.14 | 33 |
| II                           | 1                            | 2.51                      | 1.51 | 201 | 2.71                      | 1.49 | 176 | 2.44                    | 1.30 | 62 | 2.28                      | 1.31 | 101 | 2.25                          | 1.37 | 20 |
|                              | 2                            | 2.67                      | 1.49 | 193 | 2.66                      | 1.51 | 234 | 2.74                    | 1.21 | 23 | 1.84                      | 1.14 | 152 | 2.19                          | .85  | 26 |
| III                          | 1                            | 2.44                      | 1.57 | 159 | 2.62                      | 1.82 | 107 | 2.03                    | 1.55 | 33 | 2.01                      | 1.17 | 80  | 1.71                          | 1.15 | 21 |
|                              | 2                            | 2.26                      | 1.40 | 164 | 2.38                      | 1.57 | 140 | 1.87                    | 1.22 | 39 | 1.90                      | 1.68 | 51  | 1.71                          | 1.14 | 14 |
|                              | 3                            | 2.39                      | 1.39 | 51  | 2.55                      | 1.50 | 143 | 2.75                    | .87  | 12 | 1.56                      | 1.26 | 96  | 1.43                          | .98  | 7  |
| IV                           | 1                            | 1.87                      | 1.42 | 113 | 2.30                      | 1.62 | 100 | 2.28                    | 1.55 | 32 | 2.07                      | 1.50 | 68  | 1.50                          | 1.73 | 4  |
|                              | 2                            | 2.15                      | 1.43 | 87  | 2.30                      | 1.78 | 57  | 2.27                    | 1.91 | 15 | 1.69                      | 1.20 | 29  | 2.00                          | .89  | 6  |
|                              | 3                            | 2.39                      | 1.76 | 71  | 2.11                      | 1.85 | 66  | 1.80                    | 1.79 | 5  | 1.62                      | 1.32 | 21  | 1.50                          | 1.29 | 4  |
|                              | 4                            | 2.20                      | 1.30 | 5   | 2.41                      | 1.56 | 34  | 2.00                    | 0.00 | 1  | .83                       | .72  | 12  |                               |      | 0  |
| V                            | 1                            | 2.05                      | 1.53 | 64  | 1.82                      | 1.28 | 28  | 1.71                    | 1.25 | 7  | 2.16                      | 1.13 | 31  | 2.50                          | 2.13 | 2  |
|                              | 2                            | 1.79                      | 1.50 | 28  | 2.25                      | 1.96 | 24  | 1.40                    | 1.14 | 5  | 3.71                      | 2.93 | 7   |                               |      | 0  |
|                              | 3                            | 1.60                      | 1.38 | 30  | 1.33                      | 1.03 | 6   | 2.33                    | 1.53 | 3  | 3.00                      | 0.00 | 1   | 2.00                          | 0.00 | 1  |
|                              | 4                            |                           |      | 0   | 2.25                      | 1.36 | 12  |                         |      | 0  | 1.33                      | .58  | 3   | 3.00                          | 0.00 | 1  |
|                              | 5                            |                           |      | 0   | 3.00                      | 0.00 | 1   |                         |      | 0  |                           |      | 0   |                               |      | 0  |

Note.--

\* This column indicates the sequential number of the fitness report on the officers, i.e., "III" indicates the 3rd report on the officers.

\*\* This column indicates the number of reports on an officer completed by the same rater, i.e., of the total number of III reports received, "1" indicates that the 3rd report was the first one submitted on the officer by the particular rater, a "2" indicates that it was the 2nd submitted on the officer by the particular rater, and a "3" indicates that it was 3rd -- which means that all three of his ratings came from the same rater.

with each subsequent report<sup>3</sup> is evident, but no trend associated with rater familiarity<sup>4</sup> is evident from a visual inspection of Table 3.

## 2. Intercorrelations

Table 4 presents the intercorrelations between the various raw and standardized scores for both the first report and averages based on all reports.

## F. DISCUSSION

### 1. Station Differences

The results of this analysis show a distinct difference in the fitness marks received by officers assigned to various types of stations. If the assumption is made that there was no selective detailing on the basis of ability (i.e., no discrimination on ability was used by detailing officers in assigning these officers to the types of billets herein analyzed), then to treat fitness marks from some types of duty stations (like Small Combat Vessel) as equivalent to fitness marks from other types (like Shore Station, U.S.) is, in effect, penalizing the officers at the former stations and unduly rewarding officers at the latter stations.

If some type of selective detailing is operating, the equivalence of ratings given at various types of duty stations depends on the direction of the selective detailing. If there is a tendency to assign officers with greater general ability to U.S. Shore Stations, and to assign officers with less general ability to Small Combat Ships, then the fitness marks received may truly be equivalent. On the other hand, should the detailing be in the opposite direction, the fitness marks would have even more inequality than Table 1 indicates. As will be noted in later discussions, this problem of differences between duty stations in fitness reports is less serious than it seems.

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<sup>3</sup>Numerically the means in Row I > the means in Row II > the means in Row III, etc.

<sup>4</sup>For example there is no trend shown in Column  $\bar{X}_B$  on the IVth report that corresponds to the increased rater exposure, i.e.,  $\bar{X}$  is 2.30 for raters who for the first time rated the officer,  $\bar{X}$  is 2.30 for 2nd reports by the same rater, 2.11 for 3rd reports by the same rater and 2.41 for 4th reports by the same rater.

TABLE 4

## Intercorrelations of Raw and Standardized Fitness Report Scores

| RAW SCORES                                                    |       |       |       |                             |             |       |       |       |                             | STANDARDIZED SCORES |       |       |       |                             |             |       |       |       |                             |
|---------------------------------------------------------------|-------|-------|-------|-----------------------------|-------------|-------|-------|-------|-----------------------------|---------------------|-------|-------|-------|-----------------------------|-------------|-------|-------|-------|-----------------------------|
| FIRST REPORT                                                  |       |       |       |                             | ALL REPORTS |       |       |       |                             | FIRST REPORT        |       |       |       |                             | ALL REPORTS |       |       |       |                             |
| $X_a$                                                         | $X_b$ | $X_c$ | $X_d$ | $\bar{X}_{a \rightarrow d}$ | $X_a$       | $X_b$ | $X_c$ | $X_d$ | $\bar{X}_{a \rightarrow d}$ | $Z_a$               | $Z_b$ | $Z_c$ | $Z_d$ | $\bar{Z}_{a \rightarrow d}$ | $Z_a$       | $Z_b$ | $Z_c$ | $Z_d$ | $\bar{Z}_{a \rightarrow d}$ |
| $X_a$                                                         | 80    | 78    | 84    | 91                          | 75          | 63    | 67    | 70    | 73                          | 98                  | 78    | 75    | 81    | 88                          | 75          | 66    | 67    | 69    | 73                          |
| $X_b$                                                         |       | 82    | 79    | 91                          | 64          | 69    | 66    | 65    | 71                          | 78                  | 98    | 79    | 77    | 89                          | 65          | 76    | 67    | 65    | 72                          |
| $X_c$                                                         |       |       | 75    | 89                          | 62          | 62    | 72    | 63    | 69                          | 75                  | 79    | 98    | 73    | 86                          | 62          | 66    | 75    | 62    | 69                          |
| $X_d$                                                         |       |       |       | 89                          | 70          | 64    | 67    | 79    | 74                          | 81                  | 76    | 72    | 98    | 86                          | 70          | 68    | 67    | 78    | 74                          |
| $\bar{X}_{a \rightarrow d}$ (1st Rep. Average Raw Score)      |       |       |       |                             | 73          | 71    | 73    | 75    | 78                          | 89                  | 89    | 87    | 86    | 93                          | 74          | 75    | 74    | 74    | 77                          |
| $\bar{X}_a$                                                   |       |       |       |                             |             | 87    | 88    | 91    | 96                          | 72                  | 61    | 58    | 67    | 69                          | 97          | 84    | 84    | 88    | 93                          |
| $\bar{X}_b$                                                   |       |       |       |                             |             |       | 90    | 86    | 96                          | 60                  | 67    | 59    | 61    | 66                          | 85          | 97    | 87    | 84    | 93                          |
| $\bar{X}_c$                                                   |       |       |       |                             |             |       |       | 86    | 95                          | 63                  | 63    | 69    | 64    | 69                          | 85          | 87    | 97    | 83    | 92                          |
| $\bar{X}_d$                                                   |       |       |       |                             |             |       |       |       | 95                          | 67                  | 62    | 59    | 75    | 70                          | 88          | 85    | 83    | 97    | 92                          |
| $\bar{X}_{a \rightarrow d}$ (Summary Average Raw Score)       |       |       |       |                             |             |       |       |       |                             | 70                  | 69    | 66    | 71    | 73                          | 93          | 93    | 92    | 92    | 97                          |
| $Z_a$                                                         |       |       |       |                             |             |       |       |       |                             |                     | 79    | 76    | 83    | 90                          | 76          | 67    | 68    | 70    | 73                          |
| $Z_b$                                                         |       |       |       |                             |             |       |       |       |                             |                     |       | 80    | 78    | 90                          | 65          | 77    | 68    | 65    | 72                          |
| $Z_c$                                                         |       |       |       |                             |             |       |       |       |                             |                     |       |       | 74    | 88                          | 63          | 66    | 76    | 63    | 70                          |
| $Z_d$                                                         |       |       |       |                             |             |       |       |       |                             |                     |       |       |       | 88                          | 71          | 69    | 68    | 80    | 75                          |
| $\bar{Z}_{a \rightarrow d}$ (1st Rep. Average Standard Score) |       |       |       |                             |             |       |       |       |                             |                     |       |       |       |                             | 73          | 75    | 74    | 74    | 77                          |
| $\bar{Z}_a$                                                   |       |       |       |                             |             |       |       |       |                             |                     |       |       |       |                             |             | 87    | 87    | 91    | 96                          |
| $\bar{Z}_b$                                                   |       |       |       |                             |             |       |       |       |                             |                     |       |       |       |                             |             |       | 89    | 87    | 95                          |
| $\bar{Z}_c$                                                   |       |       |       |                             |             |       |       |       |                             |                     |       |       |       |                             |             |       |       | 85    | 95                          |
| $\bar{Z}_d$                                                   |       |       |       |                             |             |       |       |       |                             |                     |       |       |       |                             |             |       |       |       | 95                          |
| $\bar{Z}_{a \rightarrow d}$ (Summary Average Standard Score)  |       |       |       |                             |             |       |       |       |                             |                     |       |       |       |                             |             |       |       |       |                             |

## RATING CODE:

Note.--

Decimal point omitted.

N ranges from 889 to 1261

- a Present assignment
- b Desirability in time of war
- c Comparison with other officers
- d Personal qualities
- e Combined traits

## 2. Rater Familiarity

These were non-existent or negligible in this analysis. That is, successive reports by the same rater did not show an increment over time beyond that accounted for by the report number. (See Table 3 and discussion.)

## 3. Rating Number

The general trend of more favorable ratings with later fitness reports<sup>5</sup>, though statistically significant, does not markedly influence the relative ranks of the officers rated. (See Section 5, below.)

It is interesting to note that the "higher rating over time" phenomenon takes place even though it would not theoretically occur if the directions for marking fitness reports were rigidly followed. Fitness marks are to be based on a comparison with other officers of the same rank<sup>6</sup> and length of service. Since in each case the marking is to be made relative to other officers of equal rank and length of service even if all officers improved to the same extent (in an absolute sense) over time, the distribution of marks assigned would theoretically stay at the same level<sup>7</sup>.

## 4. Use of a Single Summary Score to Reflect an Officer's Cumulated Fitness Marks

Justification for combining ratings must consider the amount of variance that will be masked by the combining process. The more highly correlated the ratings the smaller will be the amount of information lost in the combining process and vice versa. Table 4 shows, underlined in the second diagonal subsection, the intercorrelations between average raw scores across all reports. They range from .86 to .91. Rimland (1959) has demonstrated stability in fitness marks after the accumulation of 4-5 fitness reports. The average raw scores in the present study are based upon approximately 4-5 fitness reports. The lowest average raw score intercorrelation is .86 (across all reports) which means that in this lowest relationship some variance would be lost in combining the average raw scores. In the remaining cases less variance would be lost.

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<sup>5</sup>As seen in Tables 1 and 3, a general tendency for mean fitness scores to improve with each subsequent report.

<sup>6</sup>All the officers in this sample were ensigns during the entire period studied.

<sup>7</sup>It has been substantiated that fitness marks tend to be more favorable with higher rank, so in actuality the instructions are not being rigidly followed.

The Summary Average Raw Score is a single score for each officer. If it is closely related to the Average Raw Scores representing each rating then this Summary Average Raw Score may serve to represent the cumulative fitness marks of officers across all scales. As seen in the tenth column in the table the four average raw scores for each rating are correlated .96, .96, .95, and .95 respectively with the Summary Average Raw Score. The Summary Average Raw Score thus represents the four average raw scores fairly well (only 10% of the variance is lost) and they in turn represent the cumulative fitness marks received.

## 5. Standardization of Scores

Standardizing scores, in the manner previously described, statistically removes differences in marking characteristics between stations, between report numbers, and between degrees of rater familiarity. If a Summary Average Standard Score based on these standard scores differed greatly from the corresponding Summary Average Raw Score, it would indicate that these (extraneous) situational variables (singly and/or interactionally) cumulatively are strongly influencing the fitness marks. If, on the other hand, there is a close relationship between the raw and standardized Summary Average Scores, the combined influence of these situational variables has little influence on the fitness marks. The correlation between the two scores ( $\bar{X}_{a \rightarrow d}$  &  $\bar{Z}_{a \rightarrow d}$ ) can be seen to be .97 from Table 4 (last column, tenth row). This indicates that the latter alternative is the actual one. Since the raw and the standardized (corrected) Summary Scores are essentially equivalent, the more simply attained raw Summary Score is the more feasible of the two to use as a unitary score of over-all effectiveness.

## G. CONCLUSIONS AND RECOMMENDATIONS

1. There are differences in average fitness assigned ratings of various types of duty stations, but these are relatively small in comparison with the large individual differences found among officers in the ratings received.
2. Fitness marks assigned to ensigns tend to move toward more favorable scores on succeeding reports.
3. Statistical corrections for type of duty station, rater familiarity, and report number need not be made in producing a criterion for research purposes, since the effects of these corrections are negligible.

4. The Summary Average Raw Score is a feasible unitary score for use as a research criterion of officer performance.

#### REFERENCES

Rimland, B. An analysis of officer fitness report summaries.  
Washington: Bureau of Naval Personnel, 1959. (Technical  
Bulletin 59-18)

## APPENDIX A

# **WORKSHEET** **REPORT ON THE FITNESS OF OFFICERS**

NAVPERS-310-W (REV. 2-84)

THE OFFICER REPORTED ON WILL FILL IN THE FIRST ELEVEN SECTIONS:

|                                                                                                                                                             |         |          |                                       |            |               |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|---------------------------------------|------------|---------------|-------------|
| 1. NAME (Last)                                                                                                                                              | (First) | (Middle) | 2. GRADE                              | 3. USN (R) | 4. DESIGNATOR | 5. FILE NO. |
| 6. SHIP OR STATION A. Large Combat Vessel B. Small Combat Vessel<br>C. Non-Cmbt Vessel D. Shore Dty US E. Shore Dty Outside US<br>F. Duty Under Instruction |         |          | 7. DATE REPORTED PRESENT DUTY STATION |            |               |             |

|                                                                                                                                                                       |                                                                                                                            |                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| 8. OCCASION FOR REPORT<br>SEMI-ANNUAL <input type="checkbox"/> DETACHMENT OF REPORTING SENIOR <input type="checkbox"/> DETACHMENT OF OFFICER <input type="checkbox"/> | 9. TYPE OF REPORT<br>REGULAR <input type="checkbox"/> CONCURRENT <input type="checkbox"/> SPECIAL <input type="checkbox"/> | 10. PERIOD OF REPORT<br>FROM TO |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------|

11. DUTIES. List principal duties assigned including watches, and indicate in parentheses after each the number of months during the reporting period. If assignment is in other than regular Navy billet or involves duties not well established, give outline of purpose, scope, and significance of such duties. If necessary, use separate sheet and attach to this form.

FOLLOWING TO BE FILLED IN BY THE REPORTING OFFICER:

Signature of officer reported on:

12. EMPLOYMENT OF COMMAND DURING PERIOD OF THIS REPORT

13. REFERENCE HERE AND APPEND ANY COMMENDABLE OR ADVERSE REPORTS ON THIS OFFICER RECEIVED DURING THE PERIOD OF THIS REPORT

14. PERFORMANCE OF DUTIES (In comparison with other officers of his grade and approximate length of service, consider the requirements of his duties and evaluate his performance.)

| DUTY ASSIGNMENT                      | NOT OBSERVED | Outstanding performance in most aspects of his duty assignments. Highly qualified. | Excellent performance in most aspects of his duty assignments. Efficient or competent in most of the remaining aspects. Frequently demonstrates outstanding performance. | Competent and efficient performance in most aspects of his duty assignments. Frequently demonstrates excellent performance. | Satisfactory performance in most aspects of his duty assignments. Needs some supervision. Basically qualified. | Inadequate performance in many aspects of his duty assignments. Needs close supervision. He is not qualified. (Adverse) |   |   |   |    |
|--------------------------------------|--------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---|---|---|----|
|                                      |              |                                                                                    |                                                                                                                                                                          |                                                                                                                             |                                                                                                                |                                                                                                                         | 1 | 2 | 3 | 4  |
| (a) Present Assignment               |              | 0                                                                                  | 1                                                                                                                                                                        | 2                                                                                                                           | 3                                                                                                              | 4                                                                                                                       | 5 | 6 | 6 | 10 |
| (b) As _____ Watch Officer           |              |                                                                                    |                                                                                                                                                                          |                                                                                                                             |                                                                                                                |                                                                                                                         |   |   |   |    |
| (c) Collateral Duties                |              |                                                                                    |                                                                                                                                                                          |                                                                                                                             |                                                                                                                |                                                                                                                         |   |   |   |    |
| (d) Technical Specialty _____        |              |                                                                                    |                                                                                                                                                                          |                                                                                                                             |                                                                                                                |                                                                                                                         |   |   |   |    |
| (e) Ship Handling                    |              |                                                                                    |                                                                                                                                                                          |                                                                                                                             |                                                                                                                |                                                                                                                         |   |   |   |    |
| (f) In Administration                |              |                                                                                    |                                                                                                                                                                          |                                                                                                                             |                                                                                                                |                                                                                                                         |   |   |   |    |
| (g) Ability to Command               |              |                                                                                    |                                                                                                                                                                          |                                                                                                                             |                                                                                                                |                                                                                                                         |   |   |   |    |
| (h) As Executive or Division Officer |              |                                                                                    |                                                                                                                                                                          |                                                                                                                             |                                                                                                                |                                                                                                                         |   |   |   |    |
| (i) Duty on a Staff                  |              |                                                                                    |                                                                                                                                                                          |                                                                                                                             |                                                                                                                |                                                                                                                         |   |   |   |    |
| (j) Other _____                      |              |                                                                                    |                                                                                                                                                                          |                                                                                                                             |                                                                                                                |                                                                                                                         |   |   |   |    |

15. Considering the possible requirements of war, indicate your attitude toward having this officer under your command. Would you:

Particularly desire to have him? ☐ Prefer him to most? ☐ Be pleased to have him? ☐ Be satisfied to have him? ☐ Prefer not to have him? (Adverse) ☐

16. (a) In comparison with other officers of his grade and approximate length of service, how would you designate this officer?

(b) For this report period indicate in (b) how many officers of his grade you have designated in each category of (a).

|     | One of the few highly outstanding officers I know | A very fine officer of great value to the service | A dependable and typically effective officer | An acceptable officer | Unsatisfactory (Adverse) |
|-----|---------------------------------------------------|---------------------------------------------------|----------------------------------------------|-----------------------|--------------------------|
| (a) |                                                   |                                                   |                                              |                       |                          |
| (b) |                                                   |                                                   |                                              |                       |                          |

17. COMMENTS. In this section it is important that the outstanding characteristics of the officer, and any weaknesses which seriously affect his performance of duty, be reported. The appraisal should be concise and concrete in terms of specific examples of performance from which the more general factors can be inferred. The appraisal will justify the marks assigned in items 14, 15, and 16, above. In addition, the appraisal should include outstanding qualifications in any field such as the following: administration, planning, logistics, electronics, new weapons, and in dealing with the public in personal or official contacts. This space must not be left blank.

18. NAME, GRADE, AND FILE NUMBER OF REPORTING OFFICER. OFFICIAL STATUS RELATIVE TO OFFICER REPORTED ON.

Code used to designate reporting seniors: ENS (1) LTJG (2) LT (3) LCDR (4) CDR (5) CAPT (6)

19. In comparison with other officers of his grade and approximate length of service or approximate length of duty assignment, to what degree has this officer exhibited the following qualities?

(a) PROFESSIONAL KNOWLEDGE (Consider the requirements of his various duty assignments and compare them to his professional knowledge.)

|                                          |                                                                             |                                                                                                                                                            |                                                                                                       |                                                                       |                                                                                     |
|------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| NOT OBSERVED<br><input type="checkbox"/> | Has exceptional knowledge of his duty assignments. Extremely well informed. | Has excellent knowledge of most phases of his duty assignments. Is well informed on the remaining phases. Occasionally demonstrates exceptional knowledge. | Is well informed on most phases of his duty assignments. Frequently demonstrates excellent knowledge. | Has satisfactory knowledge of routine phases of his duty assignments. | Serious gaps in his knowledge of fundamentals of his duty assignments.<br>(Adverse) |
|                                          | * 0 1                                                                       | 2 3                                                                                                                                                        | 4 5                                                                                                   | 6 8                                                                   | * 10                                                                                |

(b) COOPERATION (Consider ability and willingness to work in harmony with and for others.)

|                                          |                                                                                            |                                                                   |                                                                                  |                                                 |                                                                      |
|------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------|
| NOT OBSERVED<br><input type="checkbox"/> | Extremely successful in working with others. Has an outstanding ability to create harmony. | Promotes harmony in dealing with others. A very good team worker. | Gets along well with most people. Knows how to take orders. Fits in with a team. | Indifferent to others. Cooperates occasionally. | Inclined to create friction. Generally not cooperative.<br>(Adverse) |
|                                          | * 0 1                                                                                      | 2 3                                                               | 4 5                                                                              | 6 8                                             | * 10                                                                 |

(c) JUDGMENT (Consider his ability to grasp a situation, think clearly, and develop correct and logical conclusions.)

|                                          |                                                                                              |                                                                                    |                                           |                                                                                     |                                                                                                 |
|------------------------------------------|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| NOT OBSERVED<br><input type="checkbox"/> | Outstandingly sound and logical thinker with an exceptional grasp of the situation involved. | Exceptionally good judgment based on sound evaluation of all the factors involved. | Judgment is usually sound and reasonable. | Is prone to neglect or misinterpret facts. Occasionally commits errors in judgment. | Due to faulty judgment, his decisions or recommendations are too frequently wrong.<br>(Adverse) |
|                                          | * 0 1                                                                                        | 2 3                                                                                | 4 5                                       | 6 8                                                                                 | * 10                                                                                            |

(d) LEADERSHIP (Consider his ability in organizing, obtaining the cooperation of others, and in directing their efforts effectively.)

|                                          |                                                                                                                                      |                                                                                                                    |                                                                                                               |                                                                     |                                                         |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------|
| NOT OBSERVED<br><input type="checkbox"/> | Outstanding skill in directing others results in a very effective unit. Inspires confidence even under very difficult circumstances. | A consistently good leader. Commands respect of his subordinates. Is very effective under difficult circumstances. | Capable leader. Develops good cooperation and team work in difficult circumstances. Knows how to give orders. | Generally obtains effective cooperation under normal circumstances. | Fails to command. Unable to exert control.<br>(Adverse) |
|                                          | * 0 1                                                                                                                                | 2 3                                                                                                                | 4 5                                                                                                           | 6 8                                                                 | * 10                                                    |

(e) PROMOTION POTENTIAL (Consider his capacity to handle jobs of increased scope and greater responsibility, ability to learn rapidly, personality, self-improvement efforts, special abilities, and training.)

|                                          |                                                            |                                      |                                                           |                                                                                   |                                  |
|------------------------------------------|------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------|
| NOT OBSERVED<br><input type="checkbox"/> | Capable of increased responsibility and rapid advancement. | Very promising promotional material. | Demonstrates promise for further growth at moderate rate. | Present job is taxing his capabilities. Requires considerable amount of training. | Definitely limited.<br>(Adverse) |
|                                          | * 0 1                                                      | 2 3                                  | 4 5                                                       | 6 8                                                                               | * 10                             |

(f) MANAGEMENT EFFECTIVENESS (Consider his utilization of men, money, and materials.)

|                                          |                                                                    |                                                                                                                                          |                                                                                                                |                                                                     |                                                                                                    |
|------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| NOT OBSERVED<br><input type="checkbox"/> | Is most effective in the utilization of men, money, and materials. | Is effective in accomplishing extra savings in men, money, and materials by implementing and maintaining improved management procedures. | Conserves men, money, and materials effectively by implementing and maintaining routine management procedures. | Utilizes men, money, and materials in a barely satisfactory manner. | Is needlessly wasteful of men, money, and materials. Is irresponsible in this regard.<br>(Adverse) |
|                                          |                                                                    |                                                                                                                                          |                                                                                                                |                                                                     |                                                                                                    |

(g) REMARKS. Marks in any of the starred (\*) boxes must be justified in this section with a brief description of the factors which were considered in evaluating the officer. The justification should be in concrete and specific terms.

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20. State your estimate of this officer's capacity for original and constructive professional work and indicate to what degree his performance during this reporting period has reflected that capacity. State concrete attainments wherever possible. If not observed, so state.

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21. (a) As a general rule, officers should not be shown their fitness reports by the reporting seniors unless the report contains adverse matter. An adverse report must be referred for statement pursuant to Article 1701-(8) Navy Regulations. His statement should be attached to this report.

(b) Has the officer reported on seen this report? YES ☐ NO ☐

22. DATE FORWARDED \_\_\_\_\_

23. \_\_\_\_\_

(Signature of reporting officer)

24. \_\_\_\_\_

(Signature of regular reporting senior if report is concurrent)

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| 3. REPORT TITLE<br>THE EFFECTS OF CORRECTING EARLY FITNESS REPORTS FOR SITUATIONAL FACTORS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                     |                                                    |
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| 5. AUTHOR(S) (Last name, first name, initial)<br>Githens, William H., Rimland, Bernard, Steinemann, John H.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                     |                                                    |
| 6. REPORT DATE<br>October 1965                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 7a. TOTAL NO. OF PAGES<br>18                                                                                        | 7b. NO. OF REFS<br>1                               |
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| 11. SUPPLEMENTARY NOTES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 12. SPONSORING MILITARY ACTIVITY<br>Chief of Naval Personnel (Pers-A3)<br>Navy Department<br>Washington, D.C. 20370 |                                                    |
| 13. ABSTRACT<br><p>The major purpose of this investigation was to determine the need for making statistical corrections to the fitness reports of junior officers to adjust for possible inequalities due to extraneous situational factors. The situational influences for which corrections were made were (a) type of duty stations at which reports were made, (b) number of reports (up to 5), the officer had received, (c) rater familiarity with the junior officer, as measured by the number of successive reports completed by the same rater.</p> <p>The analysis was conducted on the reports received during the first 18 months of active duty of 1,338 members of the NROTC graduating Class of 1959. The sample was fractionated into groups homogeneous with regard to the variables being studied. Standard scores were computed for each subgroup, and these were compared with raw, unstandardized average fitness scores for the total group.</p> <p>Although conducted in the process of developing a means of using early fitness reports as a research criterion, the findings of this study were encouraging in that they suggest the fitness report to be relatively uninfluenced by extraneous factors as used operationally.</p> |                                                                                                                     |                                                    |

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