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I. MEDICAL COMPLAINTS

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RESEARCH REPORT

OF THE

U.S. NAVAL SCHOOL OF AVIATION MEDICINE

NAVAL AIR STATION
PENSACOLA FLORIDA

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U. S. NAVAL SCHOOL OF AVIATION MEDICINE
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The Tulane University of Louisiana
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CORRELATES OF PEER LEADERSHIP RATINGS: I. MEDICAL COMPLAINTS

Report by

Carroll E. Izard, Ph.D.

and

Lieutenant John H. Manhold, DC, USN

Approved by

Doctors Cecil W. Mann and Wilse B. Webb
The Tulane University

and

Captain Ashton Graybiel, MC, USN
Director of Research
U. S. Naval School of Aviation Medicine

Released by

Captain James L. Holland, MC, USN
Commanding Officer

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SUMMARY

The peer rating technique consists of having the members of a small group evaluate each other on some aspect of performance or behavior. Since peer ratings have proved a useful measure of leadership potential, it is of considerable importance to be able to predict them. However, prediction has proved exceedingly difficult because the full meaning of peer leadership ratings has not been determined.

This is the first in a series of studies designed to determine the personality or behavioral qualities measured by peer leadership ratings. The present study investigated the relationship between peer leadership ratings and data derived from eight month cumulative medical histories of the subjects. The results indicated there was a psychological component of a health index reliably identified from the medical histories, which was significantly and negatively related to peer leadership ratings. Thus, it was concluded that this personality adjustment factor reflected in the medical records furnishes further information on the problem of predicting leadership potential as measured by peer ratings.

TECHNICAL SUPPORTING DATA.....

INTRODUCTION

The peer rating technique was derived from sociometry, a method advanced by Moreno (13) for analyzing the feeling or preference relationships among the members of a human group. The original sociometric device as modified by various investigators has proved an effective instrument for assessing leadership potential within both formal and informal groups. The typical peer rating form carries a definition of leadership and instructions to nominate the individuals best and least qualified for leadership positions in the program in which the group is participating.

Much of the research relating to peer leadership ratings has been done in a military setting -- officer candidate schools or other training programs. Several investigators (1,12,14) have found acceptable repeat reliability coefficients; the median reliability reported was about .85. Numerous studies have shown a significant relationship between peer leadership ratings and such criterion measures as academic grades (17), ratings of superiors (8), graduation-elimination (8,15), and on-the-job ratings (12).

On the average peer ratings of leadership obtained in officer candidate schools and other military training programs have correlated in the .30's and .40's with graduation and with superiors' ratings of on-the-job success. This information is valuable; however, since peer ratings cannot be obtained until training is well underway they cannot be used for pre-training selection. This has led to the use of peer ratings as a criterion measure in the development of leadership tests (4,10). Such tests should make possible a pre-training assessment of individuals on the leadership variable measured by peer ratings. At least on practical grounds this represents a step forward in the process of selecting and training of people with leadership potential. The weakness of this approach lies in the fact that there is so little evidence as to precisely what is measured by peer ratings. Although their relationship to various indices of leadership has been demonstrated, there is need for further understanding of their real meaning and for more information regarding their correlates. It is recognized that the meaning of peer leadership ratings will vary from one situation to another according to the structure, needs, and goals of the groups. Although this limits the generalizations that can be made from any single study along these lines, it is reasonable to assume communality of findings for broad types of situations such as the military setting. Thus, such studies should contribute to a general theory of leadership and to the practical problem of selecting or assessing individuals for leadership positions.

What are needed to establish a wider frame of reference for interpreting peer leadership ratings are criterion measures apparently independent of these leadership ratings. Peer ratings are not independent of academic grades and superiors' ratings in that knowledge of the latter factors on the part of peers can be expected to influence their ratings of an individual. One potentially important variable which appears independent of peer leadership ratings is that of general health. Several leadership studies have dealt with physique, particularly height and weight (6,18); but the

role of health in leadership has received little attention. In the 1930's there were two studies which considered health as a variable in comparing leaders and non-leaders selected on measures other than peer ratings. Bellingrath's (2) study suggested that leaders of extra curricular activities in high school had better health than the non-leaders in these activities. Hunter and Jordan (9) failed to confirm this finding in their study of college groups. However, the latter result is difficult to evaluate since the authors did not specify what they used as an index of health or how they measured it.

It should be recognized that any index of health is likely to be a complex variable which reflects both physiological and emotional components. This suggests that the index used should be considered with emphasis on both physical disease and psychological adjustment.

It is the purpose of the present study to investigate the relationship of peer leadership ratings to indices of health and adjustment obtained from cumulative medical histories of Naval Aviation Cadets. It was hypothesized that: (a) A criterion group of cadets with a high number of dispensary visits and hospitalizations would have a lower mean peer leadership rating than the over-all cadet population; and (b) that within this criterion group, cadets adjudged to be in a 'psychosomatic' or psychogenic classification would have a lower mean peer leadership rating than the remainder of the criterion group.

PROCEDURE

The Subjects. The sample selected for this study consisted of the 26 classes (N = 1080) who entered the Naval Air Training Program during the first half of 1953. They ranged from 18 to 27 years of age. They had at least two years of college education or its equivalent. They were selected for the program on the basis of: an individual interview conducted by a flight surgeon; the Aviation Classification Test designed principally as a measure of scholastic aptitude; and a mechanical comprehension test. In addition they had to meet the Navy's physical standards when they were inducted.

The Criterion Data. The investigators obtained a complete record of all dispensary and hospital visits made by the 1080 cadets during the preflight course and the first three stages of flight training. These records made it possible to collate for each individual an eight month cumulative medical history which showed the date reported to dispensary, complaint, diagnosis, treatment, and disposition of case. These data furnished the basis for selecting the experimental groups.

The Peer Leadership Ratings. The average cadet class in this sample consisted of two sections of approximately 20 men each. A section constitutes a fairly close group -- sectionmates share common living quarters and attend the same classes. The peer leadership ratings were obtained after the groups had been living and working together for 15 weeks. The rating forms were administered to each section separately so that subjects

rated only the men in their section. Each man was requested to indicate the person in his section who was highest (H-1), second highest (H-2), third highest (H-3), third lowest (L-3), second lowest (L-2), and lowest (L-1) on leadership potential. The ratings H-1 to L-1 were given weights from +3 to -3 respectively. The raw scores obtained by summing the weights for each individual provided the basis for ranking the section on the leadership variable. The resulting ordinal data were normalized by means of Fisher's (5) rankit transformation, values drawn from a population with a mean of zero and a variance of one.

Webb (15) used an analysis of variance technique to obtain a measure of the internal consistency of the above rating form. An analysis of the data from six sections of cadets yielded correlations ranging from .85 to .90. The median reliability estimate was .865.

ANALYSIS AND RESULTS

For a preliminary analysis of the relationship between peer leadership ratings and the medical records data a group of cadets was selected with frequency of dispensary visits as criterion. It was found that the 167 subjects who had made five or more visits to the dispensary or hospital constituted approximately 15% of the total sample of 1080 cadets. Leadership ratings were available on 127 of these subjects. Their mean leadership value in terms of rankits was -.259; the standard deviation was .985. The t test for the difference between the observed mean and the population mean yielded a value of 2.98, $P < .01$.

A further analysis examined the relationship between the peer leadership ratings and personality adjustment as measured by the medical histories. The two investigators working independently classified the 167 subjects who made five or more dispensary visits into a probable 'psychosomatic' and a 'non-psychosomatic' group. The judges based their classification on two broad overlapping principles -- the differential probability with which various medical diagnoses represent somatization reactions, and the degree to which the over-all medical history suggested psychogenic determinants. In utilizing the first principle the judges were guided somewhat by previous findings (7). Following the second principle was more a matter of psychological judgment. This classification was made without any knowledge of the subjects' leadership ratings. The judges agreed on 139 of the 167 subjects classified. Inter-judge reliability was evaluated by computing Kendall's tau_t (11) from the data in Table I.

The tau_b was .66; the Pearson product-moment coefficient estimated from this value was .86.

The statistical analyses were concerned only with those subjects on whom both judges agreed and for whom leadership scores were available. The final 'psychosomatic' group had 56 subjects and the 'non-psychosomatic' had 47.

The 'psychosomatic' group had a mean leadership value of -.551 and a standard deviation of .940. For the 'non-psychosomatic' group the mean was .199, the standard deviation .914. The F_{max} test (3) showed that the variances were homogeneous. The analysis of variance of the peer leadership ratings of the two groups presented in Table II indicated that the two groups had significantly different means.

The mean peer leadership values of the 'psychosomatic and 'non-psychosomatic' groups were also compared with the population mean of zero. For the 'psychosomatic' group the t was 4.37, $P < .001$; for the 'non-psychosomatic' group the t was 1.50, $P > .10$.

The preceding statistical analyses leave open the question as to the possible influence of frequency of medical complaints on the psychological classifications. That is, was an individual classified 'psychosomatic' simply because he made numerous visits and had a long list of medical complaints? With respect to number of medical complaints, the mean and standard deviation for the 'psychosomatic' group was 10.84 and 7.09 respectively. Comparable statistics for the 'non-psychosomatic' group were 6.53 and 1.67. The fact that the difference in these means was significant at the .01 level suggested that the 'psychosomatic' group might merely be a group with a greater frequency of medical complaints. To test this latter possibility, the 'psychosomatic' group was sub-divided into a low and high half with respect to frequency of medical complaints. The mean number of medical complaints for the low half of the 'psychosomatic' group was 6.56. This was practically identical with the mean of 6.53 for the 'non-psychosomatic' group. However, the mean peer leadership rating for the low-frequency 'psychosomatic' group of -.55, identical with that for the high-frequency and over-all 'psychosomatic' groups, was significantly lower ($P < .01$) than that for the 'non-psychosomatic' group.

The results indicated that: (a) the total criterion group with five or more medical complaints had a mean peer leadership rating significantly below the population mean of zero; (b) the total criterion group was reliably classified into a 'psychosomatic' and a 'non-psychosomatic group; (c) the mean peer leadership ratings of these sub-groups differed significantly; the 'psychosomatic' group mean was significantly below zero while the 'non-psychosomatic' mean represented a chance departure from zero; and (d) frequency of medical complaints, the initial criterion, was independent of the psychological classification.

DISCUSSION

Lack of adequate criterion data has impeded both theoretical studies in leadership and applied research on the selection of individuals in terms of leadership potential. Although peer leadership ratings have been widely used as a criterion measure, their more fundamental behavioral correlates have received very little attention. The aim of the present study was to explore the meaning of peer leadership ratings by examining their relationship to data from the subject's medical histories. The first hypothesis was that peer leadership ratings were related to general health as measured by

frequency of medical complaints. This hypothesis was consistent with a preliminary analysis of the leadership scores of a group selected on the frequency criterion.

It was further hypothesized that within this criterion group, subjects with medical histories indicative of personality disorder would have a lower mean leadership score than the remainder of the criterion group. It was reasoned that there were qualitative differences among these medical histories which could be reliably identified. For example, some individuals might make five or more dispensary visits because of a peripheral injury sustained during football or boxing while others might make the same number of visits due to respiratory or gastro-intestinal disorders. Frequent recurrence of dysfunction of the latter type tended to place an individual in the 'psychosomatic' group. The term 'psychosomatic' was used in a rather broad sense; namely, as a classification for those individuals with medical complaints or over-all medical histories which were adjudged relatively more apt to have a psychogenic basis. The analysis of the data from the subgroups supported the conclusion that the 'psychosomatic' classification measured the factor that was significantly and negatively related to the peer leadership ratings.

The above conclusion should be interpreted in the light of two corollary findings. In the first place, within the groups having five or more medical complaints there was no relationship between frequency of complaints and the classification of 'psychosomatic' or 'non-psychosomatic.' This indirectly supports the inference that the classification was at least partially determined by qualitative data purportedly relevant to personality adjustment. Secondly, for the 'non-psychosomatic' group general health as measured simply by frequency of medical complaints was actually unrelated to the peer leadership ratings. This might be considered contrary to expectation in view of the possible prestige value of 'general health' in a military group. The lack of relationship may be due to the fact that the sample studied was drawn from a population selected on fairly rigorous physical standards. More importantly, the implication is that the relationship between 'health' and peer leadership ratings depends upon the nature of the health index used. This contingency might explain the apparently contradictory findings of Bellingrath and Hunter and Jordan referred to earlier. In the framework of the present study, it is the psychogenic component of health or total adjustment that represents an important correlate of peer leadership ratings.

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TABLE I

CLASSIFICATION OF SUBJECTS
AS 'PSYCHOSOMATIC' (A) OR 'NON-PSYCHOSOMATIC' (B)

Judge I

Judge II	A	B	T
A	73	15	88
B	13	66	79
T	86	81	167

TABLE II

ANALYSIS OF VARIANCE OF THE PEER LEADERSHIP RATINGS OF THE 'PSYCHOSOMATIC' AND 'NON-PSYCHOSOMATIC' GROUPS

Source	D.F.	M.S.	F.	P
Between Groups	1	14.3441	16.65	.001
'Psychosomatic' Group	55	.8841		
'Non-psychosomatic' Group	46	.8347		
Within Groups	101	.8616		
Total	102			