

# PREDICTING ADJUSTMENT OF HEART PATIENTS WITH THE CARDIAC ADJUSTMENT SCALE<sup>1</sup>

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Cardiac Adjustment Scale (CAS) scores for 74 cardiac patients between 31 and 64 years of age who completed a comprehensive cardiac rehabilitation program were examined to determine whether they could predict return to work, judged adjustment to cardiac disability, and participation in the rehabilitation program. CAS scores proved to be unrelated to either vocational status or program involvement. Low CAS scores were associated with maladjustment, but higher scores were associated equally with good and poor adjustment. The results suggested that the CAS alone was of little value in increasing the accuracy of prediction of psychological or vocational adjustment with the population studied.

It generally is recognized that psychological factors play a significant role in rehabilitation of the patient with disability due to heart disease (Gelfand, Lewis, Monheit, Shapiro, Thomson, Levine, & Hagan, 1960; Granger, 1974; Gray, Reinhardt, & Ward, 1969). Psychological evaluation and counseling of heart patient and family often are considered integral parts of cardiac rehabilitation programs in addition to efforts at physical rehabilitation (Tobis, 1974; Zohman & Tobis, 1970). Techniques that rapidly and accurately identify those patients for whom psychological adjustment problems necessitate thorough assessment and intervention would be a valuable addition to cardiac rehabilitation efforts. Early identification of patients who require the full multi-disciplinary rehabilitation team would increase efficiency of the team, reduce screening evaluation time, and conserve expensive program resources for those in need of them.

Rumbaugh (1964) has developed the Cardiac Adjustment Scale (CAS) in an effort to identify those patients with existing or potential psychological problems that could pose difficulties with their physical and vocational rehabilitation. The CAS purports to provide a method to assess the psychological adjustment and rehabilitation potential of heart patients in order to provide an objective index that indicates how a given patient compares with other cardiac patients and serves as a method of screening from a large number of heart patients those most likely to benefit from special efforts directed toward rehabilitation (Rumbaugh, 1966). Thus, the CAS appears to provide the potential for needed psychological evaluation in cardiac rehabilitation programs.

The present study investigated the utility of the CAS in clinical application in a cardiac rehabilitation program for predicting: (a) patient's involvement in rehabilitation; (b) clinical estimates of psychological adjustment; and (c) vocational outcome of rehabilitation efforts. Rumbaugh has reported that the CAS was capable of predicting the employment status of heart patients after their involvement in a cardiac rehabilitation unit (Rumbaugh, 1966; Rumbaugh, Knapp, & McCarty, 1965). This study attempted to cross-validate Rumbaugh's reports that the CAS accurately predicts employment status after rehabilitation and to investigate the validity of the CAS as a predictor of psychological maladjustment.

## METHOD

### *Subjects*

Ss were drawn from patients in an outpatient cardiac rehabilitation program in southern California (Tobis, 1974). Patients were included in the study who had

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completed the CAS, were under 65 years of age at the time they entered the program, were alive at the time of follow-up, had not been rehospitalized for cardiac problems since completion of the program, were physically capable of returning to work, and had been employed prior to hospitalization. A total of 74 patients was included, of whom 65 were men. The sample ranged in age from 31 to 64 years, with a mean age of 50.11 years ( $\sigma = 7.172$ ). The majority of Ss (82%) had suffered myocardial infarction. The remainder were receiving rehabilitation for coronary artery bypass surgery, angina, coronary insufficiency, or coronary artery disease. An average of 33.28 months had passed between the time of hospitalization and the present follow-up, which occurred 6 to 18 months after completion of the rehabilitation program. New York Heart Association ratings at the time of admission to the rehabilitation program revealed that 8% were Class I, 55% were Class II, 35% were Class III, and only 1% was Class IV. All Ss had been in competitive employment or were working as housewives prior to their hospitalization. At follow-up, 57 (77%) were employed and 17 (23%) were unemployed. Ratings of social position based on Hollingshead's Two-Factor Index of Social Position (Hollingshead, Note 1) indicated that the majority of the Ss were in the lower two social position levels (Level IV = 52%, Level V = 14%). Only 5% were rated in the upper two levels on the Index of Social Position (Level I = 1%, Level II = 4%); the remaining 29% fell into the middle level (Level III).

#### *Procedure*

The CAS was administered to all patients at admission to the rehabilitation program. The staff decision to accept a patient into the program was made independently of the CAS scores. Judgments with regard to the patient's adjustment to cardiac disability were based on consensus of clinical impressions made by the rehabilitation personnel during the patient's involvement in the rehabilitation program. Rehabilitation personnel included a clinical psychologist, a cardiologist, a rehabilitation nurse, a vocational counselor, and a physical therapist. Judgments as to adjustment were made independently of both the CAS scores and reference to other psychological test data. Ss were judged to have made an "adequate adjustment," a "mild maladjustment," or a "serious maladjustment" to their cardiac disability. Ratings of the patient's involvement in the rehabilitation program were based upon the percentage of time that he attended the program's regularly scheduled group activities. Those who attended more than 50% of the total possible sessions during their stay in the program were rated as "involved," while those who attended less than 50% were rated as "uninvolved." At the time of the follow-up Ss were contacted by phone by the staff psychologist, and inquiries were made about their work and health status.

## RESULTS

#### *Employment Status*

Employed Ss earned a slightly higher mean CAS score, mean = 122.49,  $\sigma = 16.181$ , but this difference was not statistically significant,  $t(71) = .64$ . Rumbaugh (1964) suggested grouping CAS scores in three levels: 141 and above, 121 to 140, and 120 and below. He reported that the percent employed at the 3-year follow-up for groupings is 83.4, 55.7, and 33.3, respectively. Scores for the present sample were grouped according to these suggested levels and are presented in Table 1, along with Rumbaugh's data. As can be seen from Table 1, a significant percentage of Ss with scores above 120 returned to work in both samples. However, a larger percentage of Ss with lower CAS scores in the present sample returned to work than was the case in the Rumbaugh study. A chi square for employment status by CAS score level was not significant,  $\chi^2(2) = 2.95$ . Employed Ss with a mean age of 48.95 years were significantly younger than the unemployed, whose average age was 53.00 years,  $t(70) = 2.12$ ,  $p < .05$ . Age also correlated significantly with employment status at follow-up,  $r_{pb1} = -.26$ ,  $t(72) = 2.08$ ,  $p < .05$ , while the

TABLE 1  
PERCENT OF Ss EMPLOYED AT FOLLOW-UP BY CAS SCORE LEVEL

CAS level	Percent employed	
	Present sample	Rumbaugh (1964)
141 and above	88.9	83.4
121 to 140	80.6	55.7
120 and below	65.6	33.3
	(N = 74)	(N = 79)

correlation of the CAS with the employment status,  $r_{pb1} = .07$ , and age,  $r = .10$ , proved not to be significant. An analysis of covariance that controlled for the effects of age suggests that the CAS does not contribute significantly in accounting for variance in employment status,  $F(1,69) = 2.56$ .

#### *Involvement*

Ss whose attendance at rehabilitation activities suggested involvement in the rehabilitation program did not score higher on the CAS than did those whose attendance suggested lack of involvement,  $t(70) = .50$ . Ss at different score levels suggested by Rumbaugh (1964) were not differentially involved in cardiac rehabilitation activities,  $\chi^2(2) = .21$ . Those Ss who were involved in the program, moreover, did not return to work more frequently than those who were judged uninvolved,  $\chi^2(1) = .56$ .

#### *Adjustment to Disability*

CAS score levels were related significantly to judgments of psychological adjustment,  $\chi^2(4) = 9.76$ ,  $p < .05$ . The relationship between the score levels and the adjustment levels indicates that the CAS scores above 141 did not relate to the patient's adjustment,  $\chi^2(2) = .25$ , and scores in the 121 to 140 range also were unrelated to adjustment level,  $\chi^2(2) = .18$ . However, Ss who scored below 120 on the CAS tended to have mild or serious adjustment problems,  $\chi^2(2) = 12.25$ ,  $p < .01$ .

### DISCUSSION

In the present sample of cardiac patients, the CAS has little utility in identifying patients who will become involved in rehabilitation activities, who will have problems in adjusting to their heart condition, or who eventually will be unable to return to work. Return to work after hospitalization for heart disease is an especially important issue because Rumbaugh (1966) has suggested that the critical test of the validity of the CAS is its ability to predict successful return to gainful employment. Indeed, employment status is a commonly used index of the success of rehabilitation efforts because both physiological and psychological factors can influence vocational outcome (Gelfand et al., 1960; Wells, 1974). In our sample of patients, age proved to be the best predictor of vocational outcome. Although Rumbaugh et al. (1965) found that the CAS and age together predicted employment better than either alone, the CAS did not improve on age alone as a predictor of vocational outcome. Thus, the present study failed to cross-validate the ability of the CAS to predict potential for return to work in our sample of heart patients.

The item content of the CAS was selected to reflect desirable and undesirable attitudes about heart disease and about rehabilitation. Heart patients' scores on the CAS therefore could be expected to be related to the degree to which they become involved in cardiac rehabilitation programs into which they are accepted. The involvement of patients in the present rehabilitation program, though, was unrelated to their CAS performance, and therefore could not be used to assist

staff in selection of patients who might drop out or require additional staff involvement to maintain them active in the program.

The CAS is purported to assess the psychological adjustment of patients with cardiac disease, specifically as these attitudes relate to the patient's potential for returning to gainful employment. Evidence for the validity of this assumption that the CAS measures the patient's level of psychological adjustment to his illness and disability comes from several sources. Rumbaugh (1964) constructed the CAS from ideas and feelings expressed by patients who were judged by physicians and psychologists to have a favorable or unfavorable prognosis. Secondly, significant positive correlations have been reported between the CAS and subscales of the Guilford-Zimmerman Temperament Survey (Guilford & Zimmerman, 1949), which reflect emotional stability, friendliness and cooperativeness (Rumbaugh, 1966). Goodman (1972) provides additional support for validity of the CAS in a study of the immediate and long-term adjustment of patients hospitalized with myocardial infarctions. In Goodman's study, CAS scores 4 months after discharge were found to correlate significantly with self-report and verbal measures of anxiety and depression collected during earlier inpatient stay.

In the present study, the CAS proved to be of some value in predicting patients who would be judged by staff to have adjustment problems. CAS scores below 120 were more likely to be associated with mild to severe maladjustment to disability. Only 6% of the Ss with scores below 120 achieved a good adjustment, while 37½% had serious adjustment problems. However, scores above 120 failed to discriminate among the adjustment levels. Ss with scores between 121 to 140 and over 141 were equally likely to be judged as having an adequate adjustment, a mild maladjustment, or a serious maladjustment. Use of CAS scores to predict adjustment to cardiac disability in this setting would result in a significant number of false negatives because 29% of the patients with scores between 121 and 140 were seen as having serious maladjustment problems, and 25% with scores above 141 were so judged. Thus, the CAS has some limited utility in this sample for identifying problems in psychological adjustment to disability, but has little value in identifying those who are making an adequate adjustment.

Overall, the CAS was found to have little usefulness with the present sample of cardiac patients. Failure to replicate Rumbaugh's prediction of vocational outcome raises questions about applications of the CAS in other rehabilitation settings and populations unless validity in that situation can be established separately. Ss who were in the present cardiac rehabilitation program tended to be of lower socioeconomic status than those studied by Rumbaugh. The majority of Ss in the Rumbaugh et al. (1965) study were from the middle socioeconomic levels, while the Ss in our study were largely from the lower levels. The differences in the results may be accounted for by such socioeconomic factors, and variables assessed by the CAS may not be relevant to vocational outcome in lower socioeconomic groups. Rumbaugh also included data from deceased patients with that from Ss who failed to return to work. There were no deaths by time of follow-up among patients who completed both the CAS and the rehabilitation program in our study. Inclusion of data from patients who were to die subsequent to our follow-up, but who were employed at time of follow-up may increase the prediction value of the CAS in a sample like the present one. However, the patient's vocational status after completion of rehabilitation and prior to death appears to be a more accurate way to classify outcome criteria for patients who died before follow-up.

The present results fail to support the validity of the CAS in a rehabilitation setting that serves lower socioeconomic status patients. These results do support Rumbaugh's (1964) caution that CAS scores alone do not ensure return to work or unemployment. It may be that the CAS must be weighed in conjunction with other predictors to predict accurately vocational status. However, it remains for future investigation to determine whether and in what combination the CAS

and other variables can predict return to work in varying settings and with different populations.

#### REFERENCE NOTE

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## MMPI CORRELATES OF SELF-DISCLOSURE

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Self-disclosure scores derived from a sentence completion test were correlated with MMPI performance for 25 male and 25 female adult psychiatric inpatients. Greater self-disclosure by female patients was found to be associated with higher elevations on Sc, Pt, and Si. High levels of disclosure by male patients were associated with higher levels on D and Pt and lower levels on Ma. These results suggest the possibility of an inverse relationship between self-disclosure and adjustment within a relatively disturbed population.

Jourard (1964) has postulated a curvilinear relationship between self-disclosure and mental health: Too much or too little self-disclosure suggests relatively poor psychological adjustment. The present investigation was designed to examine some psychological adjustment correlates of self-disclosure within a population of psychiatric inpatients.

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