# ABSTRACT

THILL, Janet B.  A study of personality traits
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The California Psychological Inventory (CPI) was administered to 65
exercising adults.  Subjects were involved in two different exercise
programs:  1) the Cardiac Rehabilitation Program (N=24), and
2) the Adult Fitness Program (N=41).  A comparison of personality
trait differences was made between the two groups of exercising
adults.  Results were analyzed through discriminant analysis and
the null hypotheses were tested at the .05 level of significance.
Six of the 18 scales on the CPI showed significance for the groups
tested; Capacity for Status, Social Presence, Self-Acceptance,
Tolerance, Achievement via Independence and Intellectual Efficiency.
Between groups differentiation was found on five scales through
canonical discriminant analysis;  Capacity for Status, Social
Presence, Self-control, and Intellectual Efficiency were typically
high scored scales for the AF group and the Sociability scale was
a lower scored variable for this group.  Typical members of the
CR group had a high score on the Sociability scale and corresponding
low scores on the Capacity for Status, Social Presence, Self-control,
and Intellectual Efficiency scales.  It was concluded that a
significant difference could be found on six of 18 scales of the
CPI for exercising adults.  Five of 18 scales had discriminatory
power in defining the CR group.

A STUDY OF PERSONALITY TRAITS

ASSOCIATED WITH EXERCISING CARDIAC INDIVIDUALS

AND HEALTH ADULTS

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A Thesis

Presented to the

Graduate Faculty of

University of Wisconsin - La Crosse

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In Partial Fulfillment

of the Requirements for the

Master of Science Degree

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by

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We recommend acceptance of this thesis in partial fulfillment of this

candidate's requirements for the degree:

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CHAPTER I

INTRODUCTION

Personality and fitness are being linked in an increasing number
of studies (Morgan & Costill, 1974; Valliant, Bennie & Valiant, 1981;
Hartung & Farge, 1977). Researchers are finding significant relation-
ships between certain personality variables and physiological disorders
(McPherson, Paivio, Yuhasz, Rechnitzer, Pickard & Lefcoe, 1966; Friedman
& Rosenman, 1974). One of the more well-known areas of controversy
regarding possible interrelationship of personality with physiological
function is that with onset of coronary heart disease. Ostfeld,
Lebovits, Shekelle and Paul (1964) found the coronary subject to be
socially more independent, suspicious of the motives of others and had
greater feelings of inner tension. Ibrahim, Jenkins, Cassel, McDonough,
and Hames (1966) felt that the use of coronary subjects instilled the
question of whether the traits preceded or followed onset of coronary
heart disease, and that further investigation and long-term follow-up
would obtain more objective results. He used four groups on a continuum
of (1) very low risk, (2) moderate risk, (3) high risk, and (4) a
coronary group. The findings on tests of hostility, anxiety and repres-
sion variables distinguished the coronary groups as having high scores
while other groups remain at lower gradients on the scales. These
findings indicated the pattern followed onset of coronary heart disease.

Extensive work by Rosenman, Friedman, Shaws, Wurm, Kositchek, Hahn
and Werthessen (1964), along with Jenkins, Messinger, Zyanski and

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others, on a specific behavioral pattern called Type A seemed to be a prominent finding in coronary heart disease subjects.

This study is an examination to determine if there are differences in traits of the exercising cardiac individual in a rehabilitation program, and the healthy adult involved in a prevention/maintenance program. A trait analysis between the two groups will be done to determine if there are significant differences in any of the parameters.

The test used was the California Psychological Inventory. It was stated this test was most appropriate because of its extensive use with normal individuals, and the degree to which it addresses the personality characteristics most common for day-to-day living and interaction (Gough, 1969). Traits showing correlation within groups but exhibiting significant differences between groups would be used as discriminators in the final results.

## The Adult Fitness Program

The Adult Fitness Program at the University of Wisconsin-La Crosse was started in 1977, with the basic purpose of supplying individuals within the community and industrial setting with the chance to improve their physical and mental well being. The program is designed to serve as a preventive, health maintenance program geared towards cardiovascular endurance, nutritional education, and enhancement of flexibility. The program sessions run Monday, Wednesday, and Friday from 6:00 a.m. to 7:00 a.m. Qualified exercise leaders guide participants through the sessions, which include a warm-up, jog (specified mileage groups for participants at differing fitness levels), and a sufficient cool-down

period.  The leaders also provide encouragement and support to the participants as they perform the physical activity.

Entry into the program is gained through the individual taking the first step and completing a form, sent to the program.  A referral is then obtained from the primary physician, and an evaluation of diet and exercise is performed at the Human Performance Laboratory.  An individual exercise prescription is administered to the participant for the amount of activity safely undertaken during the exercise phase of the program.

The participant is on his/her own in the follow through or attendance to the program.  Daily attendance is checked by the program leaders, but participation is not mandatory.

Through the use of the Adult Fitness Program, it was the intention of the researcher to note personality traits which would be significant indicators of the group, traits making them distinct as a health oriented group.

### The Cardiac Rehabilitation Program

The Cardiac Rehabilitation Program at the University of Wisconsin-La Crosse is a part of the La Crosse Exercise Program designed to enhance the health status of physician-referred cardiac and high risk individuals. The program enables periodic laboratory evaluations and exercise sessions, held on Monday, Wednesday, Friday afternoons from 4:00 p.m. to 6:00 p.m.

The evaluations take place in the Human Performance Laboratory and/ or local clinic and are medically supervised.  A graded exercise test, nutrition counseling, blood analysis, and electrocardiograms, are part of the evaluation procedure of the patient to insure proper exercise

prescription. The information which is collected is forwarded to the primary physician for his future reference.

Upon receipt of the exercise prescription, the individual may start the walking, swimming or jogging phase of the program. The individual will start out in the Beginning Group which is supervised by a physician, and after significant improvement in health status is acquired, he/she may attend Advanced Group sessions, these being non-physician supervised. The degree of exercise exertion is progressively increased based on the periodic evaluations in the laboratory.

The personality traits found to correlate within the cardiac rehabilitation program would be used as indicators for the over-all group profile.

## Statement of the Problem

The ultimate purpose of the study was to note the specific differences between two groups of individuals involved in two differing fitness programs.

One program was geared towards physical maintenance of the healthy individual, the other program was designed for treatment and rehabilitation of the cardiac individual. Personality traits having high correlations within the two groups might give the researcher a better understanding of the type of individual prone to cardiac related problems.

Through the use of the California Psychological Inventory, personality traits were identified for all subjects taking part in the study. The first objective of the researcher was to obtain the list

of traits characteristic of each group that were high in correlation. The second objective was to study differences in personality traits existing between the two groups.

The following questions were to be answered: 1) Were there traits specific to each group?; and 2) If there were differences in traits between two groups, what was the specific cardiac personality?

## Limitations

The following limitations needed to be acknowledged by the researcher:

1. The subjects in the study had been involved in the program a varying number of years.

2. There was a variance in attendance rates of the participants.

3. Fitness levels of the participants varied within groups.

4. Test administration occurred at different times to accommodate subjects.

5. Deliberate faking or misrepresentation on psychological tests cannot be ignored, although the CPI contains a scale to control for this.

6. This study did not test out for variables which may influence results, i.e., age, sex, social status.

## Assumptions

1. It was assumed the CPI was administered with a consistent technique for all scheduled test groups.

2. It was assumed the subjects would complete the test honestly.

## Definition of Terms

Exercising Cardiac Group - members of an ongoing, Phase III health treatment/maintenance program, having a high risk profile for diagnosis of coronary heart disease. (La Crosse Exercise Program)

Health Fitness Group - a group of individuals involved in ongoing, organized physical exercise for improvement/maintenance of fitness status. (La Crosse Exercise Program)

Personality Traits - those various characteristics of an individual which distinguish his/her state of being. (Megargee, 1972)

## Hypothesis

1. There will be no significant differences found between personality traits of the cardiac group and the adult fitness group.

2. There will be no traits specific to the cardiac group signifying a cardiac personality.

CHAPTER II

REVIEW OF RELATED LITERATURE

## Introduction

Physiological functioning and a relationship with various personality traits has become an area of increased investigation (Young & Ismail, 1978; Sharp & Reilley, 1975). Through the use of personality tests such as the Minnesota Multiphasic Personality Inventory, the 16 Personality Factor Questionnaire, California Psychological Inventory, Eysenck Test and others, specific traits have been associated with different physiological parameters. The correlations with-in groups have been compared to between-groups in an attempt to associate physical patterns with specific group types. Personality traits have been used to distinguish children, college students and sedentary individuals as groups possessing unique qualities (Morgan & Costill, 1974).

The cardiac prone and "Type A" individuals seem to maintain a high correlation with compared trait pattern and physiological responses. If this is true, traits specific to the Type A person might possibly be modified to decrease risk involvement. The modification for these behaviors may come through exercise, but the changes need to first be acquired and then maintained for a long period to note the benefits.

Finally, the personality test utilized needs to be scrutinized for its ability to yield in obtaining valid and reliable results each time.

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This chapter will be divided into four areas; 1) the personality and physiological correlation, 2) coronary personalities, 3) cardiac prone personality and "Type A", and 4) the California Psychological Inventory.

## Personality and Physiological Correlation

Using the CPI, Schendal (1965), found that there was a significant difference between the personalities of the athlete and non-athlete on eight scales at the junior high level, four at the high school level, and nine at the college level. Schendal's reason for the study was to note characteristic differences between young male participants and non-participants of competitive athletic programs. He used 334 team sport participants and non-athletes from the ninth and twelfth grades and junior and senior college level to obtain his results. Kroll (1970) wrote "a basic premise of almost quasi-mystical potency for personality research in athletics is that athletes possess unique and definable personality attributes different from the non-athletes." He expounded on this concept in looking at problems and strategies facing those assessing the personalities of athletes.

Lakie in 1961 performed a study which utilized 230 subjects from four schools. The students were chosen from a State University, private university and two State Colleges. He compared athletes utilizing five scales of the Omnibus Personality Inventory.

This test was constructed to look at college students and differentiate the personality traits of designated groups involved in intercollegiate sport activities.

Five sports were studied between total sport groups, no differences could be found, but a significant difference on the Social Maturity scale for total school groups was found for the private school in comparison with the other three. Within the schools, and between sports a few significant findings were obtained.

One of the differences which was significant was a lower mean score on Social Introversion for football players over track men. Another finding was that both basketball players and wrestlers had obtained a higher mean score for the Liberalism scale than the tennis-golf group.

Valliant, Bennie and Valiant (1981) utilized the 16 PF questionnaire and found nine significant differences between marathoners and joggers. The groups consisted of 30 marathoners having recently completed the Labatt's Marathon in Toronto, and a jogging group of 38 participants obtained from some fitness centers in Ontario and Quebec.

The marathoners rated high on qualities of intelligence, imagination, self-sufficiency, tender-mindedness and were more reserved. In comparison, the joggers had the following qualities: they seemed to be more happy-go-lucky, controlled, and apprehensive. The experiment did reveal differences in personality traits of individuals at different levels in the same mode of activity. The significant differences were found on the following factors: A,B,F,I,M,N,O,$Q_2$, and $Q_3$. These factors relate to the following descriptors respectively, intelligence, emotionality versus stableness, sober versus happy-go-lucky, tough versus tender-mindedness, practical versus imaginative, forthright versus shrewd, self-assured versus apprehensive, group dependence versus self-sufficiency, and undisciplined self conflict versus control.

Hartung and Farge (1977) performed personality and physiological
tests on 48 male runners from ages 40-59. They used the Cattell 16
Personality Factor Questionnaire and showed significant results on
seven of the sixteen scales when the subjects were compared against mean
scores of the general population. The scales indicated the runners were
more reserved, and liked to work alone, and they possessed high mental
abilities in learning skills and intellect. These results were indica-
tive of a sober individual with a serious nature, being shy and a bit
withdrawn, but more imaginative. They seemed more forthright or
genuine but awkward socially. The highest score for any one scale was
in the area of confidence and resourcefulness. The physiological
responses obtained showed the runners to have a fitness level that
could be compared with men 20 years younger. In having examined these
results, the question may be raised whether the physiological factors
resulted in the personality structure or personality structure led to
the physiological responses.

The variables chosen to describe cardiovascular fitness showed
Factors G and N, expediency and forthrightness, were significant at the
.05 level and correlated with resultant change in the Max VO$_2$ due to
the training program. Factor L at the .01 level and Factor N at the
.05 level (trusting and forthrightness respectively) showed signifi-
cance also. They found the profiles of the joggers demonstrated a
reserved, shy, imaginative quality, along with being less conscientious,
having more trust, of higher intelligence, being less likely to
integrate, self-sufficient and forthright. Dominance was slightly
lower for the group but the Liberalism score was a bit higher.

A study by McPherson, Paivio, Yuhasz, Rechnitzer, Pickard, and Lefcoe (1966) showed significant traits in adult exercising males. These differences were inclusive of a more relaxed nature, a tendency to be more outgoing, eccentric, conscientious, easy-going, enthusiastic, youthful, and mature when compared with the sedentary non-cardiac and cardiac groups.

In a study by Young and Ismail (1976), four groups of seven adults were classified as young, high-fit; old, high-fit; young, low-fit; and old, low-fit. The Cattell 16 PF Questionnaire, the EPI and an anxiety scale of the Multiple Affect Adjective Checklist were used to test for personality traits prior to the exercise program. The exercise program consisted of jogging, calisthenics, and recreation over a four month period. Fitness was assessed through physiological data collected from graded exercise tests performed prior to and following the exercise program.

At completion of the program and post testing on the personality tests, the results showed distinct personality traits with the highest group having significant M, $Q_4$, O, L, C and NEUR, H, and B factors. To be more explicit, these factors denote: an unconventional nature, composure, security, easy-goingness, emotional stability, adventuresomeness, and intelligence. The differences in age were that the young group were more extroverted and outgoing, with the high-fit, young members also being more aggressive and dominant than old, high-fit. At post-test the high-fit group showed increased self-sufficiency and all groups showed increased qualities in persistence, social precision and control.

Summarizing the traits found to be most prevalent for regular joggers, or runners compared to the normal population trait patterns it was indicated that the exercisers exhibit significant psychological differences. They are more reserved, yet imaginative, serious, and self-confident, liking to work alone, and are honest and straightforward which may cause a social awkwardness at times. It would also seem from the final study, with the onset of an exercise program, changes may occur in the areas of control, and precision in dealing with day to day occurrences.

## Coronary Personalities

Concerning the specific traits most common in cardiac disease populations, a number of questions arise. Do the individuals of this group have a specific pattern of behavior? Were the traits a result of the event or did they in fact precede the illness?

A study by Brozek, Keys, and Blackburn (1966) was begun in 1948. It followed 258 subjects for 14 years. These subjects were diagnosed to be clinically free of disease. Over the next 14 years, 31 developed coronary heart disease with 138 remaining normal. The MMPI and Thurstone Temperment Schedule showed the coronary subjects to have significantly higher mean scores. The "Hypochondriasis" scale of the MMPI and masculinity scale score were significantly higher in the coronary subjects. There was also a significant elevation in the "Activity Drive" scale from the Thurstone Schedule. The "Activity Drive" scale is exemplary of the fast moving, active individual who does not slow down to relax even when activity can be more relaxed.

In looking at specific traits of the cardiac individual, McPherson, Paivio, Yuhasz, Rechnitzer, Pickard and Lefcoe (1966) found in a pre-test using the 16 PF Questionnaire that a cardiac group consisting of 18 males was more inclined toward manifesting traits described as fickleness, tension, emotion and a tendency to remain aloof. The semantic inventory titled Me As I Typically Am was used to assess mood states and long term changes at the beginning of the 24 week exercise program and again at the end. The test revealed a tendency for cardiacs to be more time oriented and aggressive.

The exercising group showed higher levels of self control and reliability. Their initial conclusion was that the cardiac subjects had definable personality characteristics prior to involvement in an exercise program. The cardiac exercisers experienced some changes in their trait patterns towards more favorable measures following the exercise involvement.

The differences between a group of exercising cardiac subjects and a group of non-exercising cardiac controls were investigated by Naughton, Bruhn and Lategola (1968). In utilizing the MMPI, they found lower but statistically non-significant scores for depression and hypochondriasis scales for the exercising cardiacs.

Ibrahim, Jenkins, Cassel, McDonough and Hames (1966) measured three variables of personality; anxiety, repression, and manifest hostility. They used three groups of subjects obtained from the Epidemiological Study of Cardiovascular Diseases in Evans County, Georgia. The groups were classified as: 1) 171 "low risk", sub-jects having low blood pressure and low cholesterol values; 2) a

"moderate risk" group of 205 subjects containing 127 individuals with blood pressure readings of systolic greater than or equal to 160 and/or a diastolic of greater than or equal to 100 mmHg, and 78 individuals with an elevated serum cholesterol of greater than 260; 3) the final group of 30 was designated the "high risk" group with high readings in both categories. The study sample for this design was composed of 40 low-risk subjects, 78 in the moderately high risk group and 30 for the high-risk group. Thirty-two members were included in a fourth category to compose the coronary disease group.

The findings of the profile tests were significant in differentiation of coronary versus non-coronary groups. Ibrahim, et al, concluded the coronary group had higher scores of suppressed hostility, repression and manifest anxiety and also stated the patients most probably acquired these variables following the coronary incident.

Ostfeld, Lebovitz, Shekelle and Paul (1964) found in their study of 1795 Western Electric employees that when tested on the MMPI, the angina and infarction groups showed the former group to have greater tendencies toward lability and suggestibility, and the latter was more controlled. The Cattell 16 PF was also administered with the results exhibiting the total coronary group to score high on the L and $O_2$ factors meaning they were more independent in social relationships and had greater suspicions of others and functioned at greater levels of inner tension.

These results would seem to indicate that the coronary personality is inclined toward: 1) suppression and aggressiveness, 2) being

anxiety-prone, 3) having high ratings of inner tension, and finally, 4) an urgency in time-oriented situations.

## Cardiac-Prone Personality and "Type A"

One of the points brought out by Mordkoff and Parsons (1967) was that studies for finding a coronary personality usually utilized subjects already having had a coronary event. They felt the outcomes from the psychological tests may have been patterns incurred after onset. Comparisons of these findings with findings from research of the "Type A" behavior pattern, also having been called the cardiac-prone personality, should be made.

The type A behavior is characterized by excessive drive, competitiveness, a sense of time-urgency, tension, abrupt speech and movement patterns, and impatience (Friedman & Rosenman, 1974). The Type A individual is often noted as maintaining a total commitment to his/her occupational environment.

Type A behavior has been implicated as a risk factor in coronary heart disease (Friedman & Rosenman, 1974). Friedman and Rosenman have performed extensive research of the area and have arrived at some interesting conclusions.

The initial study began in 1960 and utilized 3524 male subjects between 39 and 59 years of age (Rosenman, Friedman, Straus, Wurm, Kositcheck, Hahn & Werthessen, 1964). Two questions were asked: 1) what was the predictability of coronary heart disease in people when specific parameters were investigated? and 2) what was the profile of the coronary-prone male after follow-up was performed? Rosenman and

Friedman felt that if suspicions of coronary heart disease occurrence in populations exhibiting Type A behavior were true, the incidence over a period of years would prove this. Other researchers involved in the study felt two other points should be followed, one being the changes in serum lipoprotein shown by beta/alpha ratios and the relationship with coronary heart disease, the other was to measure the defects with blood coagulation in relationship to coronary heart disease.

Of the 3524 subjects classified, 113 were found to have pre-existing coronary heart disease and were eliminated from future study. The finding for the coronary heart disease group showed pattern Type A to be evident in 80 of the 113 men signifying a strong association between the two. A blind technique was used whereby the investigators were unaware of the coronary pattern of the subjects prior to designation as Type A.

At the $2\frac{1}{2}$ year follow-up of the remaining 3411 subjects (Rosenman, Friedman, Straus, Wurm, Jenkins & Messinger, 1966), 70 subjects turned up with coronary heart disease. Significant findings in lipoprotein abnormalities, hypertension and Type A patterns were prognosticators. Type A was the single factor showing greatest correlations with coronary heart disease. Of the 1584 men classified with the pattern, 13.6/1000 cases had coronary heart disease, whereas 4.0/1000 subjects with Type B incurred the disease per year. Incidence of coronary heart disease when Type A and hypertension were combined, showed a two-fold increase over normotensive subjects with the same pattern. Oddly enough, hypertensive Type B and normotensive Type B incidence of coronary heart disease was comparable.

The major conclusion drawn from this follow-up stated the presence or absence of this behavior pattern carried a great deal of weight as a prognostic tool.

At the 4.5 year follow-up of the 3411 men involved, 133 "well" men had experienced onset of coronary heart disease.

Again the Type A pattern had a significant involvement in the findings. During this study the researchers decided to perform in-depth analyses of all risk factors which may "explain away" the association of coronary heart disease and Type A. Their findings were that the pattern remained a strong independent factor of significance. The per year statistical rate was 13.2/1000 for Type A when compared to 5.4/1000 for Type B in occurrence of coronary heart disease (Rosenman, Friedman, Straus, Jenkins, Zyzanski & Wurm, 1970).

The 8½ year follow-up study showed 257 subjects with occurrence of coronary heart disease. Significant associations were found with parental history, diabetes, level of education obtained, smoking, behavior pattern, blood pressure and serum levels. As was stated by the authors, the younger group had Type A behavior significantly asso-ciated with incidence of symptomatic and unrecognized/silent myocardial infarction (Rosenman, Jenkins, Brand, Friedman, Straus & Wurm, 1970). The conclusion stated the relationship of the Type A behavior pattern as a risk factor in coronary heart disease was a prominent finding, alone as well as with other described variables. Neuro-hormonal responses to the Type A behavior were implicated as underlying in the coronary heart pathogenesis.

As was stated in the previous explanation of Type A, it is a habit acquired over a period of time and relates to the individual's behavior in reaction to environmental stimuli. In attempts at changing the Type A behavior it has been implied that the amount of stress and resistance to the change of rehabilitation may in fact cause an increased risk of recurrence of the coronary problem. To decrease the urgency to return to their previous level of activity, these individuals may require longer period for rehabilitation (Pollock & Schmidt, 1979).

It has been stated that the characteristic reactions of the Type A individual seem to trigger physiological responses (Elmadjian, Hope & Lamson, 1958; von Euler, 1964). Type A as a cause of increased levels of catecholamine secretion had been implicated as a precursor of coronary heart disease (Friedman, St. George, Byers & Rosenman, 1960). The higher levels of catecholamine release have been associated with increased stress and lesion development (Elmadjian, et al., 1958; von Euler, 1964). A study by Friedman, Byers, Diamont and Rosenman (1975) on catecholamine response of the Type A individual in a mental stress situation suggested the norepinephrine values were basically different between A and B type individuals. In the 15 Type A subjects the norepinephrine level for the pre-contest measure was .51 ng/ml whereas .37 ng/ml was measured for Type B. During the contest, values were .58 ng/ml and .42 ng/ml respectively. Results under non-competitive situations for Type A were greater than control subjects. A speculative conclusion drawn out by Friedman, et al., was that the

increased productions of norepinephrine may serve as a prime factor in Type A subjects' pathogenic formation of coronary heart disease over time.

Pollock and Schmidt (1979), stated it would be difficult to accept a biochemical relationship and the Type A behavior pattern as having a cause-effect response in CHD. If the areas of hypercholestrolemia, hyperlipidemia, hyperinsulinemia and norepinephrine secretion are valid precursors to CHD and are interrelated in Type A individuals, would this be sufficient cause to name Type A as an indication of eventual CHD. Future research into this area is required to note the degree of Type A involvement with these pathological findings.

Jenkins, Zyzanski and Rosenman (1978) looked at the possibility of a number of traits of Type A behavior differentiating between areas of coronary heart disease. They noted the characteristics of angina subjects differed from those of the subject suffering myocardial infarction, although traits remained strongly Type A. The authors felt sensitive prediction of coronary proneness along with specificity of the predictions could be enhanced with these findings.

In Kenigsberg, Zyzanski, Jenkins, Wardwell and Licciardello's study (1974) hospitalized patients were tested for Type A behavior. Results showed the Type A scale and hard-driving scale to be significantly higher in cases than controls. The cases consisted of 48 subjects with known coronary disease and 42 subjects completely free of coronary disease and hospitalized for some other malady.

Finally, a study of Type A behavior associated with coronary atherosclerosis, after age, sex, blood pressure, serum cholesterol and

smoking history were examined, showing Type A patients with a greater degree of moderate and severe occlusions. The significance again suggests the Type A risk factors as indicative of the coronary heart disease process via their actions on atherosclerotic build-up (Blumenthal, Williams, Kong, Schanberg and Thompson, 1978).

The method utilized in classification of the Type A individual was initially designed in 1965 with reviews in 1966 and 1969. It contained 61 items and was devised to measure four variables. The first scale was an over-all measure of the behavior believed to be coronary-prone. The other three were more specific, dealing with "Speed and Impatience", "Job Involvement", and "Hard-driving" qualities. Testing was performed in 1965 on 2750 subjects deemed free of coronary heart disease and were followed for four years. The reliability of the test was compared to yearly results. The scale results correlated at .64 to .74 for all years, with the exception of "Hard-driving" scale testing from .56 to .60. The scores obtained at each testing seemed to be stable with 90% of the subjects remaining within 10 points of previous tests. For prediction of coronary heart disease, 120 subjects were diagnosed after four years as having the disease. These men in whom coronary problems developed, presented positive scores for Type A averaging at 1.70. Controls were slightly below the population mean.

In their final discussion of the results, Jenkins, Rosenman and Zyanski (1974), felt that no single scale alone from their test was as important in distinguishing the coronary-prone personality as the combination of scales.

## The California Psychological Inventory (CPI)

Many personality tests revolve around psychological pathologies and are unable to relate specifically to assessment of the normal personality.

Some studies performed on athletes used the Minnesota Multiphasic Personality Inventory and resulted in psychopathic identification on the scales, such as paranoia, depression, or other noted psychiatric deviations. This type of informative data had led away from discussion of the normal athletic personality (Schendal, 1965).

Kroll (1970), cited the California Psychological Inventory (CPI) as one of the more useful instruments for assessment of normal personality traits. The test was established to describe those personality characteristics of the individual which were related to the positive and favorable aspects of personality rather than the pathological aspects.

Many of the personality tests contain a number of scales that were used to provide a better view of total behavior in an individual.

The CPI, it must be noted, contains 18 such scales. (Gough (1969), in devising the test, felt that each scale was intended to cover one important facet of interpersonal psychology, and the total set was intended to provide a comprehensive survey of an individual from the social interaction point of view. Gough maintained in the second point of conceptual analysis that observations of the individual's scoring at different points of the scales could aid in making inferences on the basis of resulting patterns (Megargee, 1972).

The division of the 18 scales by Gough into four groups aids the professional in the interpretation of the test profile. These groupings are included for interpretational benefit rather than statistical analysis. The development of Class I was derived for the measure of social skills and how an individual relates in group environments. Class II is related to the intrapersonal adjustment of the individual, the degrees to which he/she handles responsibilities. The third class is one of achievement and intellectual functioning and Class IV deals with the sensitivity of the individual such as his/her psychological-mindedness, flexibility in situations, and femininity.

In construction of the scales, Gough utilized the basic method called "empirical technique". This takes the specific dimension that is to be measured and defines it. The statements that have a bearing on that scale are assembled and administered to individuals who may have what seems to be high characterization in that area. "Correct" responses are most often given by those subjects tested specifically for that item (Gough, 1969).

The interactions among scales, such as patterns developing with high and low scores is an integral part of analysis of the test by the interpreter. The individual patterns found may develop into group patterns, hence inferences may be drawn within a population. Kelly, Thorndike and Cronbach, found in Buros (1965) stated there was a convincing validity existing for the scales. But they criticized the CPI in regard to the use of extreme groups for distinguishing trait patterns, these groups lying in the top and bottom 10% for populations sampled. The researchers felt the ignoring of empirical intercorrelation

and favoring of logical scale relations, along with not discussing why the high correlations existed with some scales from other inventories, took place.

Lake, Miles and Earle (19750, feel there may be some datedness to some of the personality constructs, making measurement less exact. They feel that value shifts in today's society may cause some irrelevance to be found in some of the scales. An example of their feelings could be found in the Femininity Scale and the movement toward inter-relationships of job responsibilities, and household tasks. But one could also take into account this scale's ability to measure the sensitivity of the individual being tested.

<center>Summary</center>

Personality traits have been used to differentiate physiological status. Traits found to be most common in exercising adults have been: a controlled nature, imaginative, self-sufficient/independent, a bit withdrawn, and confident. For coronary subjects, traits most prevalent were: increased tension, emotional lability, suppression of hostility, independence of social relationships and inclined towards time urgency. The Type A behavior associated with the cardiac-prone individual exhibits patterns of increased job involvement, hard-driving qualities, speed and time urgency, impatience, competitiveness and tension.

In studies for the Type A behavior, physiological responses have been shown to coincide with the pattern.

Scales from different tests seem to point toward similarity in personality patterns and indicate similarity in traits among persons within specific groups.

# CHAPTER III

## METHODS

The purpose of this study was to determine if personality pro-
files were significantly different between two groups of exercising
adults. The groups were classified as: 1) those members of an Adult
Fitness program geared towards prevention and health maintenance, and
2) those members of a Cardiac Rehabilitation Program geared towards
treatment of cardiac problems.

## Subjects

The data obtained were based on results from 41 members of the
Adult Fitness Program and 24 members of the Cardiac Rehabilitation
Program involved in the La Crosse Exercise Program at the University
of Wisconsin-La Crosse. Males and females participated in the study,
and occupations of the members of each group were varied.

Members of both groups varied in length of time involved in the
exercise programs as well as achieved fitness levels.

All subjects volunteered for the test.

## Instrumentation

The California Psychological Inventory (CPI) was utilized for
the test. It is a paper-and-pencil test printed in a reusable booklet.
The answer sheets were of a computerized form and were numbered
according to group and individual for purposes of confidentiality.

Results were received from the computer center and transposed onto individualized profile sheets. The individual profile sheets contained 18 scales for measurement. Permission was obtained from The Consulting Psychologists Press, Inc. to include the profile sheet and a copy of the scale descriptors of the CPI by Harris G. Gough, Ph.D., in Appendix A.

## Procedure

Participants were asked to volunteer 1 to 2 hours of their time to take the test at a pre-arranged time. A cover letter containing information about the study was administered to all Cardiac Rehabilitation and Adult Fitness participants. The letters were inserted in the participants' card index slot to insure that all active members were included in the study. An informed consent form was administered with each letter. Scheduled test times were verified upon volunteering for the study (See Appendix B for Cover Letter and Consent Form).

Group testing was conducted in a meeting room located in Mitchell Hall, on the campus of the University of Wisconsin-La Crosse. Individual testing was conducted in a student lounge located in the same building. The tests were placed on the tables along with answer sheets and #2 pencils. As subjects entered the testing area they were asked to take a seat and read the self-explanatory directions in the front of the booklet. If any subject had questions regarding the inventory, he/she raised their hand for assistance. Subjects were given as much time as they required to complete the test.

## Analysis of Data

The procedure utilized to analyze the collected data was discrim-
inant analysis. This is the process by which construction of a linear
combination of variables is made, thus reducing the analysis of group
differences to a univariate problem. Discriminant analysis results
are presented in terms of the relative importance of each variable in
explaining variance in the criterion. The analysis identifies
variables underlying discrimination between groups. Each variable
has a discriminant score noted to be either positive or negative on a
linear scale.

This method was chosen because it includes the inferential and
predictive multivariate techniques and focuses on the analysis of
groups of populations and/or sets of data (Eisenbeis, 1972). The
predictive uses of this analysis are based on formation and use of
classification scheme. Three assumptions of the discriminant analysis
of statistics include: 1) groups are discrete and identifiable,
2) types of variables used in description of observations pertaining
to each group are measurements made on a number of characteristics of
variables, and 3) the variables or characteristics are assumed to have
in each population, a multivariate normal distribution.

From the CPI, 18 scales were scored utilizing this technique and
were used to compare the cardiac rehabilitation and adult fitness
populations.

Group results were presented to participants from the Adult Fit-
ness and Cardiac Rehabilitation groups by a licensed psychologist

during two scheduled meeting times. Individual results could be obtained by the subjects through making an appointment with the licensed psychologist located in the Counseling and Testing Center on the University of Wisconsin-La Crosse campus.

Statistical analysis of data was performed by the Computer Center at the University of Wisconsin-La Crosse. A conclusion of the results will be found in Chapter 4.

# CHAPTER IV

## RESULTS AND DISCUSSION

### Introduction

The California Psychological Inventory was administered to 65
adult subjects involved in the La Crosse Exercise Program at the
University of Wisconsin - La Crosse. Forty-one of the subjects who
participated in the study were involved in the Adult Fitness Unit of
the program. This unit was designed as a health prevention/maintenance
program for healthy individuals. The remaining 24 subjects were par-
ticipants of the Cardiac Rehabilitation Unit. These members had
existing coronary heart disease and/or major risk factor involvement.
Subjects from the Cardiac Rehabilitation Unit were classified as
Group 1 in the analysis, and subjects from the Adult Fitness Unit
were designated Group 2 in the results.

### Results

Discriminant analysis of the 18 scales on the CPI was utilized
to identify scale scores which best separated the two groups. Results
of the initial analysis are presented in Tables 1 and 2. In addition
to the significance of each explanatory variable, the measure of
"Coefficient for Canonical Variables" is presented. The canonical
value indicates the relative strength of the variable in discrimin-
ating between the two groups. Tables 3 and 4 present the variables

Table 1

Discriminant Analysis Scale Scores

| CPI Scale | Group 1 N=24 $\overline{X}$ | S.D. | Group 2 N=41 $\overline{X}$ | S.D. | F | P |
|---|---|---|---|---|---|---|
| Dominance | 29.71 | 7.01 | 32.61 | 5.69 | 3.31 | .07 |
| Capacity for Status | 19.92 | 4.51 | 22.68 | 3.06 | 8.66 | .004* |
| Sociability | 23.96 | 5.51 | 26.15 | 4.71 | 2.88 | .09 |
| Social Presence | 33.38 | 5.63 | 38.10 | 6.40 | 8.98 | .004* |
| Self-Acceptance | 20.75 | 4.31 | 22.95 | 3.73 | 4.70 | .034* |
| Sense of Well-Being | 36.46 | 4.8 | 37.17 | 3.87 | .43 | .52 |
| Responsibility | 30.13 | 4.15 | 31.05 | 4.47 | .68 | .41 |
| Socialization | 36.79 | 4.88 | 36.68 | 3.71 | .10 | .92 |
| Self-control | 30.33 | 6.74 | 30.02 | 7.13 | .3 | .86 |
| Tolerance | 22.08 | 3.40 | 24.07 | 4.10 | 4.03 | .049* |

*P < .05

Table 2

Discriminant Analysis Scale Scores

| CPI Scale | Group 1 N=24 | | Group 2 N=41 | | F | P |
|---|---|---|---|---|---|---|
| | X̄ | S.D. | X̄ | S.D. | | |
| Good Impression | 17.83 | 5.37 | 18.63 | 5.52 | .32 | .57 |
| Communality | 26.29 | 1.49 | 25.98 | 1.52 | .66 | .43 |
| Achievement via Conformance | 27.08 | 4.99 | 29.32 | 4.04 | 3.89 | .053 |
| Achievement via Independence | 19.25 | 4.04 | 21.49 | 4.04 | 4.65 | .03* |
| Intellectual Efficiency | 36.71 | 4.89 | 40.51 | 4.87 | 9.19 | .003* |
| Psychological Mindedness | 11.83 | 3.27 | 12.80 | 2.87 | 1.57 | .22 |
| Flexibility | 7.88 | 3.9 | 9.88 | 4.41 | 3.39 | .07 |
| Femininity | 18.50 | 4.39 | 17.44 | 4.79 | .79 | .38 |

*P < .05

Table 3

Standardized Canonical Discriminant Function Coefficients

| | Scale | | |
|---|---|---|---|
| 1 | Do | .03821 | |
| 2 | Cs | -.79579* | Adult Fitness |
| 3 | Sy | .70094* | Cardiac Rehab |
| 4 | Sp | -.62658* | Adult Fitness |
| 5 | Sa | -.13064 | |
| 6 | Wb | .20255 | |
| 7 | Re | .22845 | |
| 8 | So | -.20740 | |
| 9 | Sc | -.45291* | Adult Fitness |
| 10 | To | -.00403 | |
| 11 | Gi | .31769 | |
| 12 | Cm | .16456 | |
| 13 | Ac | -.26445 | |
| 14 | Ai | .24338 | |
| 15 | Ie | -.66653* | Adult Fitness |
| 16 | Py | .36687 | |
| 17 | Fx | -.05267 | |
| 18 | Fe | .14218 | |

Total Group Means

1  Cardiac Rehabilitation    .74018
2  Adult Fitness            -.43328

Table 4

Classification Results for Canonical Discriminant Analysis

| Group | No. of Cases | Predicted Group Membership 1 | 2 |
|-------|--------------|-----------------------------|---|
| 1 | 24 | 16 | 8 |
| | | 66.7% | 33.3% |
| 2 | 41 | 14 | 27 |
| | | 34.1% | 65.9% |

*Percent of "Grouped" cases correctly classified: <u>66.15%</u>

and their relative discriminating power. The further from zero, the greater the power of the variable in discriminating between groups. High scores on negatively weighted variables are characteristic of the Adult Fitness group whereas high scores on the positively weighted CPI variables characterize the Cardiac Rehabilitation group.

When tested at the .05 level of significance, differences between groups were obtained on six of the 18 CPI scales. These scales were: 1) Capacity for Status (Cs), 2) Social Presence (Sp), 3) Self-Acceptance (Sa), 4) Tolerance (To), 5) Achievement via Independence (Ai), and 6) Intellectual Efficiency (Ie). Five of the 18 CPI scales yield strong discriminatory power between groups when canonical discriminant analysis was performed. Discussion of these results will follow.

## Discussion

The traits found to be significant were Capacity for Status, Social Presence, Self Acceptance, Tolerance, Achievement via Independence, and Intellectual Efficiency. Each significant scale will be described with specific group involvement noted.

Capacity for Status (Cs): This scale was a significant factor for the Adult Fitness group. It is defined in terms of ambition, and found in individuals of an active, forceful nature, having insight and resourcefulness and being effective communicators. The Cs scale seeks to define qualities common to those able to attain status, it is not utilized as a measure of achieved status.

Social Presence (Sp): Social presence, another factor most characteristic of the AF group, is often considered a measure of self-confidence, ability to respond in social interaction and is often associated with the Sociability (Sy) scale. The individual with high Sp scores seems to maintain higher levels of aggression, and irritability, and is adept at manipulating others when in a social gathering, whereas the Sy scale is more inclined towards an out-going, happy-go-lucky nature.

Self-Acceptance (Sa): The Self-Acceptance scale is used to assess security and self-confidence, and abilities to feel at ease within social situations as well as when alone. This scale through verification of its validity was found not to be an indicator of adjustment, rather it was meant to identify individuals who are comfortable with their personal self. Both groups scored significantly higher on this scale than the average population.

Tolerance (To): The purpose of this scale was to identify social beliefs and attitudes of a permissive, accepting and non-judgmental nature. The items in the scale are reflective of flexibility in one's social environment. The high scoring individual is commonly found to be trusting of others and confident. The AF group rated significantly higher on this scale.

Achievement via Independence (Ai): This scale was developed for prediction of achievement in college undergraduates. The college setting was thought to be an environment in which the person is independent and creative, having freedom in decision-making. Both

the AF group and CR group had significantly higher scores than the mean scores for the general population.

Intellectual Efficiency (Ie): Gough (1969) felt this scale was actually a measure of the individual's ability to perform a task through utilization of intellectual functions. The AF group showed higher scores in relation to the general population values for the scale.

In dealing with the scores obtained from the Adult Fitness members, it would appear that these individuals manifest dominant, assertive, aggressive, achievement oriented traits. Also, they seem to maintain greater flexibility, tolerance and are more inclined to be driven or active.

The Cardiac Rehabilitation subjects as a group would seem to have more problems in dealing with changes in lifestyle, and maintain a more critical and judgmental outlook than the Adult Fitness group. The CR group when faced with conditions contrary to their feelings would also appear to have difficulty accepting the latter.

The findings of this study are comparable with the following: The results of Hartung and Farge (1977) in utilization of the Cattell 16 PF showed like qualities such as greater resourcefulness, imagination, a genuine nature and also forthright qualities. Valliant, Bennie and Valiant (1981) found joggers to be controlled and a bit apprehensive, yet happy-go-lucky. They also found marathoners to be higher on scales of intelligence, imagination, and tender-mindfulness than the joggers. Hammer and Wilmore (1973) found the imaginative quality, trusting nature, liberal attitude and forthright variables

to be most prominent in their study of personality traits and physiological parameters following an exercise program. McPherson, et al., (1966) noted the enthusiastic, out-going traits along with conscientiousness and a mature attitude in a study using the exercising male adult.

A study of cardiac personality traits performed by Ibrahims, et al., (1966) found suppressed hostility, repressed feelings and a greater tendency toward anxiety in the coronary group when compared with the non-coronary group. Ostfeld, et al., (1964) found the coronary group had higher scores on maintenance of independence in social relationships, greater levels of inner tension, and also to be more readily suspicious of others. Finally McPherson, et al., (1966) found traits described as fickleness, tension, aloofness and emotion along with time-oriented and aggressive behaviors to be prominent in their study cardiac individuals.

In dealing with results from the canonical discriminant function, the analysis showed five scales to be strong indicators of the individual's group membership. On an individual basis the typical Adult Fitness member obtained high scores on Capacity for Status, Social Presence, Intellectual Efficiency, and Self-Control, but relatively low score on Sociability. The description of such a person would indicate an assertive, ambitious, clear-thinking nature with a generally high frustration tolerance. On the other hand, the typical Cardiac Rehabilitation individual portrays a lower frustration tolerance, would seem to be more low-keyed, non-aggressive when interacting with people, but maintains a genuine affection for them.

These findings relate to the following scales; a high score on the Sociability measure, and lower scores on the Capacity for Status, Social Presence, Intellectual Efficiency and Self-control scales.

In summary, the Adult Fitness person outwardly appears as expressive, out-spoken, ambitious, aggressive, driven, and handles frustration relatively well; however, the Cardiac Rehabilitation person appears more "mellow", is less likely to express disagreement than the Adult Fitness person, but internally the Cardiac Rehabilitation person may have more difficulty in tolerating disagreement and frustration, than the Adult Fitness person.

# CHAPTER V

## SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

### Summary

The purposes of this study were to note the specific personality trait differences between two groups of exercising adults and to determine if a specific cardiac personality could be distinguished.

Sixty-five adults from the La Crosse Exercise Program took part in the study. The personality test used was the California Psychological Inventory. Results obtained through discriminant analysis indicated significant differences between the Cardiac Rehabilitation and Adult Fitness groups on 6 of 18 scales of the CPI. Five of 18 scales revealed discriminatory power between the two groups.

### Conclusions

Based on the data obtained from the study, two conclusions may be drawn.

1. Null hypothesis number one, which stated there would be no difference between personality traits of the Cardiac group and the Adult Fitness group was rejected. The analysis found significant differences on six of the 18 scales.

2. Null hypothesis number two which stated there would be no traits specific to the Cardiac group signifying a cardiac personality was rejected. The Cardiac Rehabilitation group

obtained a higher score on the Sociability measure and lower scores on the scales, Capacity for Status, Social Presence, Intellectual Efficiency, and Self-control through canonical discriminant analysis.

## Recommendations

Based on the findings of this study, several recommendations are offered for future study.

1. A follow-up study be performed to note recurrence of results found to be significant in this study.

2. A study be conducted comparing the results obtained from the CPI with that of the Jenkin's Activity Survey for Type A behavior.

3. A study be conducted in which personality traits be considered in relation to physiological parameters.

4. A long-term study be conducted following Adult Fitness members having traits similar to those found in Cardiac subjects.

5. A study be performed noting changes in personality pattern following involvement in an exercise program for both populations.

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APPENDIX A

SCALE DESCRIPTORS & PERMISSION INFORMATION
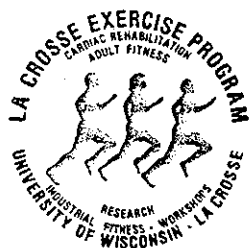
Mitchell Hall
University of Wisconsin-La Crosse
La Crosse, Wisconsin 54601

January 22, 1982

Consulting Psychologists Press, Inc.
Palo Alto, California

Dear Sirs:

I am a graduate student at the University of Wisconsin-LaCrosse, working toward a Master's of Science degree in Cardiac Rehabilitation/Adult Fitness. In the I am undertaking to complete for the program's require- ments, I will be using the California Psychological Inventory to test the personality traits of two groups. A licensed psychologist, well versed in the use of this particular test will be supervising and aiding me.

To have this study be as thorough as possible, I would like to have your permission to include in the paper the table of adjectives describing the eighteen CPI scales found starting on page 260 of the California Psychological Inventory Handbook and a copy of the Profile sheet. Individuals reading the completed thesis may obtain a better understanding of the specific traits found to be significant through the study.

I hope you are able to aid me in making this study one that is complete and comprehensive in nature. Thank-you for your time and consideration and I will be looking forward to your written reply in the near future.

Sincerely,

Janet B. Thill
Graduate Student (AF/CR)

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PALO ALTO, CALIFORNIA 94306

Janet B. Thill
La Crosse Exercise Program
Mitchell Hall
Univ of Wisconsin
La Crosse, Wisconsin 54601

In response to your request of      January 22, 1982        permission is hereby
granted you to
        include a copy of the CPI profile in the paper you are writing
    for yo r Master's degree. (Sorry but the adjectives are not under our
    copyright. You will have to write Jossey Bass. Unless you wish to
    use descriptions of the scales from the CPI Manual which is ours)

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By _____
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Date _____ February 3, 1982

| | SCALE AND PURPOSE | |
|---|---|---|

## Class I. Measures of Poise, Ascendancy, Self-Assurance and Interpersonal Adequacy

| | | |
|---|---|---|
| Aggressive, confident, persistent, and planful; as being persuasive and verbally fluent; as self-reliant and independent; and as having leadership potential and initiative. | 1. Do (dominance) To assess factors of leadership ability, dominance, persistence, and social initiative. | Retiring, inhibited, commonplace, indifferent, silent and unassuming; as being slow in thought and action; as avoiding of situations of tension and decision; and as lacking in self-confidence. |
| Ambitious, active, forceful, insightful, resourceful, and versatile; as being ascendant and self-seeking; effective in communication; and as having personal scope and breadth of interests. | 2. Cs (capacity for status) To serve as an index of an individual's capacity for status (not his actual or achieved status). The scale attempts to measure the personal qualities and attributes which underlie and lead to status. | Apathetic, shy, conventional dull, mild, simple, and slow; as being stereotyped in thinking; restricted in outlook and interests; and as being uneasy and awkward in new or unfamiliar social situations. |
| Outgoing, enterprising, and ingenious; as being competitive and forward; and as original and fluent in thought. | 3. Sy (sociability) To identify persons of outgoing, sociable, participative temperament. | Awkward, conventional, quiet, submissive, and unassuming; as being detached and passive in attitude; and as being suggestible and overly influenced by others' reactions and opinions. |
| Clever, enthusiastic, imaginative, quick, informal, spontaneous, and talkative; as being active and vigorous; and as having an expressive, ebullient nature. | 4. Sp (social presence) To assess factors such as poise, spontaneity, and self-confidence in personal and social interaction. | Deliberate, moderate, patient, self-restrained, and simple; as vacillating and uncertain in decision; and as being literal and unoriginal in thinking and judging. |
| Intelligent, outspoken, sharp-witted, demanding, aggressive, and self-centered; as being persuasive and verbally fluent; and as possessing self-confidence and self-assurance. | 5. Sa (self-acceptance) To assess factors such as sense of personal worth, self-acceptance, and capacity for independent thinking and action. | Methodical, conservative, dependable, conventional, easygoing, and quiet; as self-abasing and given to feelings of guilt and self-blame; and as being passive in action and narrow in interests. |
| Energetic, enterprising, alert, ambitious, and versatile; as being productive and active; and as valuing work and effort for its own sake. | 6. Wb (sense of well-being) To identify persons who minimize their worries and complaints, and who are relatively free from self-doubt and disillusionment. | Unambitious, leisurely, awkward, cautious, apathetic, and conventional; as being self-defensive and apologetic; and as constricted in thought and action. |

## Class II. Measures of Socialization, Maturity, Responsibility, and Intrapersonal Structuring of Values

| | | |
|---|---|---|
| Planful, responsible, thorough, progressive, capable, dignified, and independent; as being conscientious and dependable; resourceful and efficient; and as being alert to ethical and moral issues. | 7. Re (responsibility) To identify persons of conscientious, responsible, and dependable disposition and temperament. | Immature, moody, lazy, awkward, changeable, and disbelieving; as being influenced by personal bias, spite, and dogmatism; and as under-controlled and impulsive in behavior. |
| Serious, honest, industrious, modest, obliging, sincere, and steady; as being conscientious and responsible; and as being self-denying and conforming. | 8. So (socialization) To indicate the degree of social maturity, integrity, and rectitude which the individual has attained. | Defensive, demanding, opinionated, resentful, stubborn, headstrong, rebellious, and undependable; as being guileful and deceitful in dealing with others; and as given to excess, exhibition, and ostentation in their behavior. |
| Calm, patient, practical, slow, self-denying, inhibited, thoughtful, and deliberate; as being strict and thorough in their own work and in their expectations for others; and as being honest and conscientious. | 9. Sc (self-control) To assess the degree and adequacy of self-regulation and self-control and freedom from impulsivity and self-centeredness. | Impulsive, shrewd, excitable, irritable, self-centered, and uninhibited; as being aggressive and assertive; and as overemphasizing personal pleasure and self-gain. |
| Enterprising, informal, quick, tolerant, clearthinking, and resourceful; as being intellectually able and verbally fluent; and as having broad and varied interests. | 10. To (tolerance) To identify persons with permissive, accepting, and non-judgmental social beliefs and attitude. | Suspicious, narrow, aloof, wary, and retiring; as being passive and overly judgmental in attitude; and as disbelieving and distrustful in personal and social outlook. |
| Co-operative, enterprising, outgoing, sociable, warm, and helpful; as being concerned with making a good impression; and as being diligent and persistent. | 11. Gi (good impression) To identify persons capable of creating a favorable impression, and who are concerned about how others react to them. | Inhibited, cautious, shrewd, wary, aloof, and resentful; as being cool and distant in their relationships with others; and as being self-centered and too little concerned with the needs and wants of others. |

## Class II. Measures of Socialization, Maturity, Responsibility, and Intrapersonal Structuring of Values

(Continued)

| HIGH SCORERS | SCALE AND PURPOSE | LOW SCORERS |
|---|---|---|
| Dependable, moderate, tactful, reliable, sincere, patient, steady, and realistic; as being honest and conscientious; and as having common sense and good judgment. | 12. Cm (communality) To indicate the degree to which an individual's reactions and responses correspond to the modal ("common") pattern established for the inventory. | Impatient, changeable, complicated, imaginative, disorderly, nervous, restless, and confused; as being guileful and deceitful; inattentive and forgetful; and as having internal conflicts and problems. |

## Class III. Measures of Achievement Potential and Intellectual Efficiency

| HIGH SCORERS | SCALE AND PURPOSE | LOW SCORERS |
|---|---|---|
| Capable, co-operative, efficient, organized, responsible, stable, and sincere; as being persistent and industrious; and as valuing intellectual activity and intellectual achievement. | 13. Ac (achievement via conformance) To identify those factors of interest and motivation which facilitate achievement in any setting where conformance is a positive behavior. | Coarse, stubborn, aloof, awkward, insecure, and opinionated; as easily disorganized under stress or pressures to conform; and as pessimistic about their occupational futures. |
| Mature, forceful, strong, dominant, demanding, and foresighted; as being independent and self-reliant; and as having superior intellectual ability and judgment. | 14. Ai (achievement via independence) To identify those factors of interest and motivation which facilitate achievement in any setting where autonomy and independence are positive behaviors. | Inhibited, anxious, cautious, dissatisfied, dull, and wary; as being submissive and compliant before authority; and as lacking in self-insight and self-understanding. |
| Efficient, clear-thinking, capable, intelligent, progressive, planful, thorough, and resourceful; as being alert and well-informed; and as placing a high value on cognitive and intellectual matters. | 15. Ie (intellectual efficiency) To indicate the degree of personal and intellectual efficiency which the individual has attained. | Cautious, confused, easygoing, defensive, shallow, and unambitious; as being conventional and stereotyped in thinking; and as lacking in self-direction and self-discipline. |

## Class IV. Measures of Intellectual and Interest Modes

| HIGH SCORERS | SCALE AND PURPOSE | LOW SCORERS |
|---|---|---|
| Observant, spontaneous, quick, perceptive, talkative, resourceful, and changeable; as being verbally fluent and socially ascendant; and as being rebellious toward rules, restrictions, and constraints. | 16. Py (psychological-mindedness) To measure the degree to which the individual is interested in, and responsive to, the inner needs, motives, and experiences of others. | Apathetic, peaceable, serious, cautious, and unassuming; as being slow and deliberate in tempo; and as being overly conforming and conventional. |
| Insightful, informal, adventurous, confident, humorous, rebellious, idealistic, assertive, and egoistic; as being sarcastic and cynical; and as highly concerned with personal pleasure and diversion. | 17. Fx (flexibility) To indicate the degree of flexibility and adaptability of a person's thinking and social behavior. | Deliberate, cautious, worrying, industrious, guarded, mannerly, methodical, and rigid; as being formal and pedantic in thought; and as being overly deferential to authority, custom, and tradition. |
| Appreciative, patient, helpful, gentle, moderate, persevering, and sincere; as being respectful and accepting of others; and as behaving in a conscientious and sympathetic way. | 18. Fe (femininity) To assess the masculinity or femininity of interests. (High scores indicate more feminine interests, low scores more masculine.) | Outgoing, hard-headed, ambitious, masculine, active, robust, and restless; as being manipulative and opportunistic in dealing with others; blunt and direct in thinking and action; and impatient with delay, indecision, and reflection. |

APPENDIX B

COVER LETTER & CONSENT FORM

**La Crosse Exercise Program**

Mitchell Hall
University of Wisconsin-La Crosse
La Crosse, Wisconsin 54601

November 13, 1981

<u>To the Participants of the Adult Fitness Program</u>:

You are invited to participate in a study which is concerned with measuring the personality traits of exercising adults. You have been selected due to your on-going participation in the LaCrosse Exercise Program.
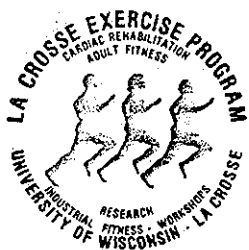
The test you will be asked to take, will involve one hour of your time. You can choose one of the appointed times on the following page, or another time can be set for your convenience.

Group results of the test will be explained during a special presentation. At your request, the individual results will be explained to you by a licensed psychologist. The test to be used will be the California Psychological Inventory, an instrument developed to measure the personality traits of normal individuals.

The information obtained from this study will remain confidential. Names and individual scores will not be used in the completed paper. Only group scores will be stated.

If you have any questions, please ask. I will appreciate your participation in my study.
Thank-you.

Janet Thill
Graduate Student AF/CR

November 13, 1981

<u>To the Participants of the Cardiac Rehabilitation Program</u>:

You are invited to participate in a study which is concerned with measuring the personality traits of exercising adults. You have been selected due to your on-going participation in the LaCrosse Exercise Program.

The test you will be asked to take, will involve one hour of your time. You can choose one of the appointed times on the following page, or another time can be set for your convenience.

Group results of the test will be explained during a special presentation. At your request, the individual results will be explained to you by a licensed psychologist. The test will be the California Psychological Inventory, and instrument developed to measure the personality traits of normal individuals.

The information obtained from this study will remain confidential. Names and individual scores will not be stated in the completed paper. Only group scores will be used.

If you have any questions, please ask. I will appreciate your participation in my study. Thank-you.

Janet Thill
Graduate Student AF/CR
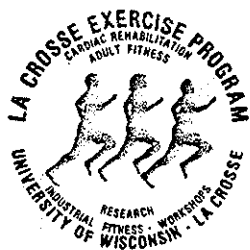
Mitchell Hall
University of Wisconsin-La Crosse
La Crosse, Wisconsin 54601

November 13, 1981

INFORMED CONSENT

Being informed of the guidelines of this study, I will participate in the study being conducted by Janet B. Thill, a graduate student in the Adult Fitness-Cardiac Rehabilitation Program.

Signed_____ Date_____

Address_____

_____

Would you like to know your individualized results?_____

I will commit myself to the following appointment time:

November 27, 1981    Friday morning
                7:00 to 8:00 _____
November 27, 1981    Friday afternoon
                4:00 to 5:00 _____
                5:00 to 6:00 _____

December 2, 1981    Wednesday afternoon
                4:00 to 5:00 _____
                5:00 to 6:00 _____

December 4, 1981    Friday morning
                7:00 to 8:00 _____

December 4, 1981    Friday afternoon
                4:00 to 5:00 _____
                5:00 to 6:00 _____

I would like to set up some other arrangements with you. _____

Please return this form by November 23, 1981.

*Serving the community through adult fitness. cardiac rehabilitation and industrial fitness and the profession through research. workshops. and education.*
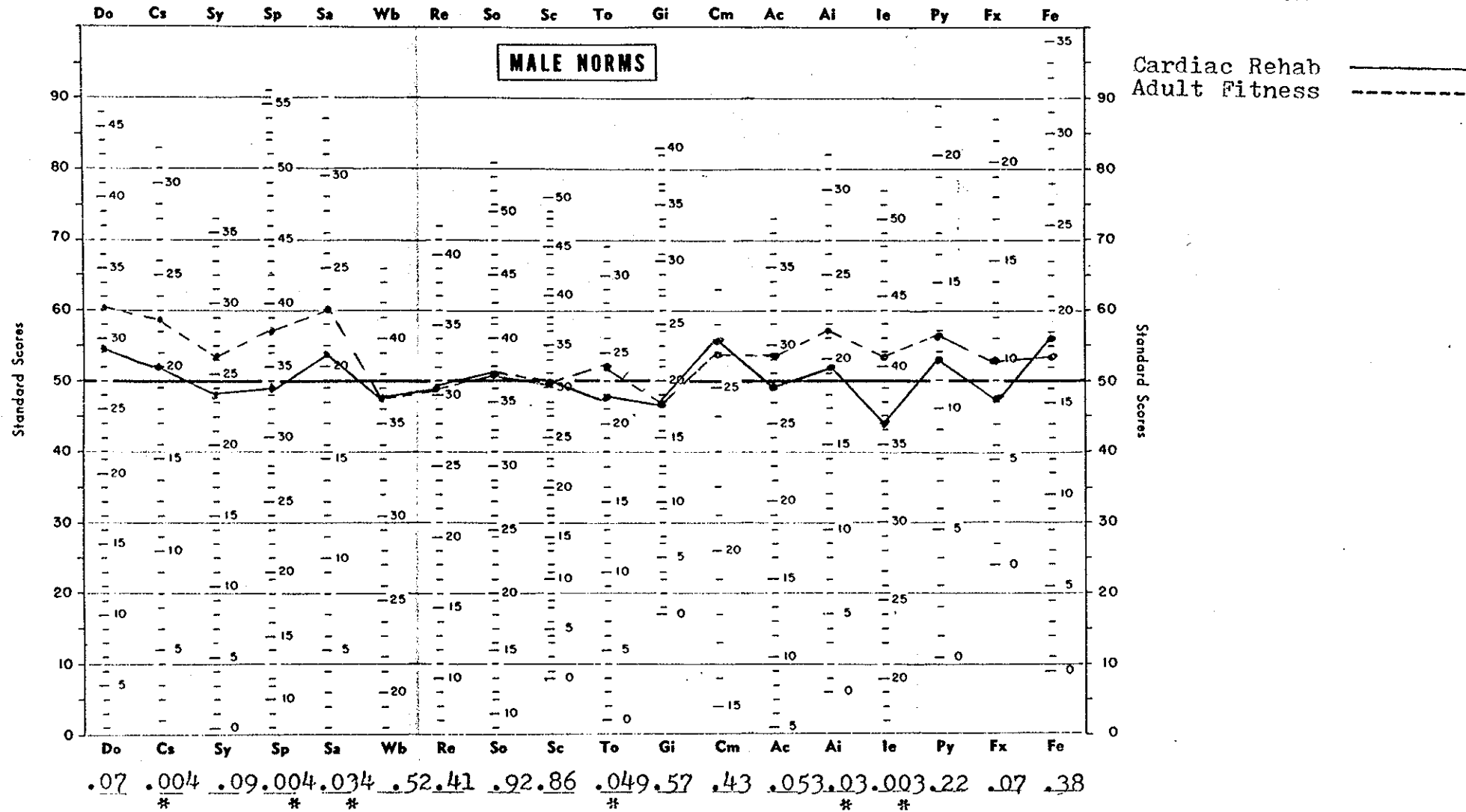
School of Health, Physical Education and Recreation

Master of Science Degree in Adult Fitness · Cardiac Rehabilitation

APPENDIX C

AF/CR PROFILE COMPARISON

Name: Levels of Significance   Age _____   Date Tested _____

Other Information _____

**Notes:**

**MALE NORMS**

Cardiac Rehab ———
Adult Fitness  ----------

Standard Scores

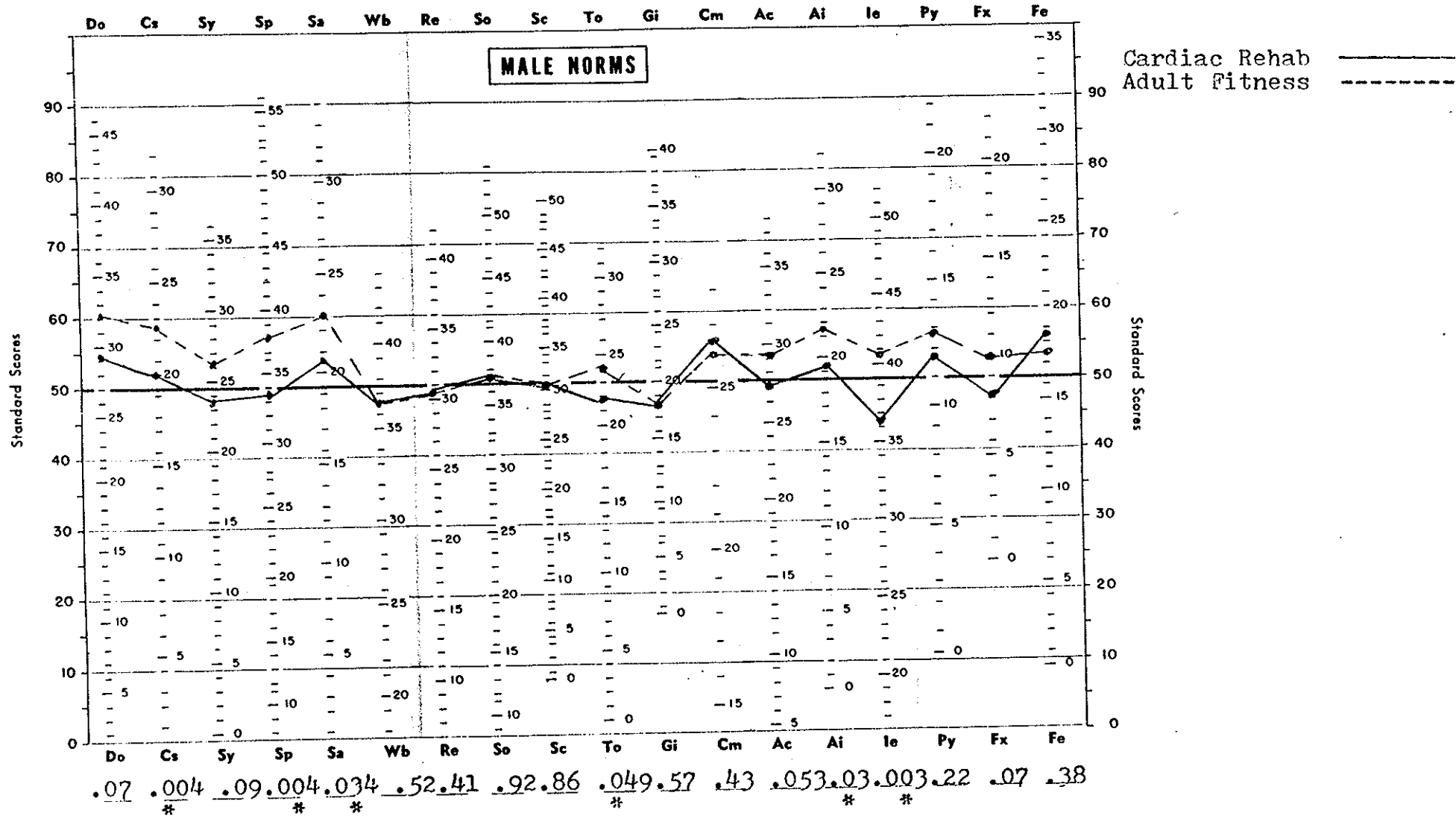| Do | Cs | Sy | Sp | Sa | Wb | Re | So | Sc | To | Gi | Cm | Ac | Ai | Ie | Py | Fx | Fe |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| .07 | .004 | .09 | .004 | .034 | .52 | .41 | .92 | .86 | .049 | .57 | .43 | .053 | .03 | .003 | .22 | .07 | .38 |
| | * | | * | * | | | | | # | | | | * | # | | | |

Male Norms

Name __Levels of Significance__   Age _____   Date Tested _____

Other Information _____

**Notes:**

Do  Cs  Sy  Sp  Sa  Wb  Re  So  Sc  To  Gi  Cm  Ac  Ai  Ie  Py  Fx  Fe

**MALE NORMS**

Cardiac Rehab ————
Adult Fitness - - - - - -

Standard Scores

90
80
70
60
50
40
30
20
10
0

Do  Cs  Sy  Sp  Sa  Wb  Re  So  Sc  To  Gi  Cm  Ac  Ai  Ie  Py  Fx  Fe

.07 .004 .09 .004 .034 .52 .41 .92 .86 .049 .57 .43 .053 .03 .003 .22 .07 .38

Male Norms