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Date **October 12, 1985**
Abstract

Occupational fitness programs have enjoyed enormous popularity over the course of the past decade. Their continuing penetration into all sectors of the business community coupled with the rapid growth of organizations serving professional fitness personnel, suggests that their presence may be permanent.

A major reason for the popularity of occupational fitness programs, is the claim that fitness programs can reduce employee absenteeism. Two important issues at this time are:

1. the role of physical fitness in mediating sickness absence behavior, and,
2. the role of participation in occupational fitness programs as a way of enhancing worker attendance motivation.

These issues fit in well with the Steers & Rhodes (1978) Process Model, a conceptual framework which deals with employee absenteeism from the standpoints of ability to attend (ie. high fitness) and motivation to attend (ie. high morale). The Steers & Rhodes theoretical model was chosen as an appropriate vehicle to guide this study.

Part I reviewed the claim that physical fitness as a physiological state, is inversely related to sickness absence among employees. The literature review suggested that fit employees would miss fewer days from work than unfit
employees. The prediction that physical fitness and sickness absence will be inversely related, formed the core of the hypotheses generated in Part I. In addition, hypotheses were also developed concerning the possible effects of gender, age, length of service and company affiliation.

Correlational analyses were performed on several physiological and absence variables obtained from a sample of employees from the years 1979 through 1984.

Modest but significant inverse correlations were found to exist between $MVO_2$ and a number of different absence measures. The magnitude of these correlations disappeared in some cases when the groups were controlled for gender.

Significant correlations were also found between variables such as length of service and absence or age and absence. Absence patterns for males and females and management and classified employees also showed significant group differences. These results point to the need to consider these personal and socio cultural variables when attempting to describe any relationships between occupational fitness and absenteeism.
Part II chose the Steers & Rhodes concept of motivation to attend. Based on the review of literature, it was expected that participants in the company fitness program would report positive changes in a number of attitudinal and personal variables.

A simple questionnaire was developed to assess this change, and the entire population of a very large (n=1076) corporate fitness program was polled. Respondents in the main, indicated a significant improvement in their personal perception of a number of different attitudinal variables. The magnitude of this improvement was significantly related to the length of time they have been members of the program and their degree of participation in the program.

Supervisor

Dr. Patricia Vertinsky

November 1985

Vancouver, British Columbia
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I would like to thank Doctors Ilan and Patricia Vertinsky for their guidance and moral support through the course of this manuscript. Special thanks to Dr. Martin Collis and Dr. Stanley Brown for their editorial comments.

The statistical treatment of data was made much easier through the efforts of Mr. Vinay Kanetkar and Mr. Kenneth Lassessen.

This project could never have been completed without the complete support of Dr. Colin Hardie, Mr. Bruce Shearer, Ms. Debbie Colvin and Ms. Penny Bearss of The British Columbia Telephone Company.

Finally, I would like to thank my wife Marlene, for her editorial scrutiny, her infinite patience and her unwavering support through a difficult and lengthy project.
CHAPTER ONE

Essays in Occupational Fitness and Absenteeism

1.10 Introduction

The physically fit body and the pursuit of fitness through sport and exercise, have over the centuries occupied positions of importance in many cultures. In North America, the physical education movements of the 1880's and early 1900's were deeply rooted in the doctrines of moral and spiritual development. There is little question that many of these beliefs endure to this day (Kroll, 1982).

A more recent development is the wholesale adoption of occupational fitness programs by major corporations (Collis, 1977; Allen 1982). Although pioneers such as the National Cash Register Company of Dayton, Ohio implemented employees 'health breaks' and designated specific exercise areas as early as 1894, the majority of occupational fitness programs have only begun to appear over the course of the last decade (Jacobs, 1981).

Worksite fitness programs, at least for large corporations are rapidly becoming the rule rather than the exception. A 1978 estimate placed the number of U.S. corporate fitness programs at 300. By 1982, that figure had mushroomed to 3,000 (Palisano, 1982). Mirroring this rapid growth is the meteoric rise in membership of organizations
such as the Association for Fitness in Business (AFB), which is among the the fastest growing professional organizations on the continent (Kisby, 1983; Barnes, 1983).

Current interest in occupational fitness can be linked in no small measure to popular claims that "fit employees make better employees" (Moore, 1983). The belief that promoting fitness among employees can have a positive business impact gained wide acceptance during the 1970's (Brennan, 1982).

The inflationary spiral of the latter part of that decade saw corporate health care costs rising at an ever accelerating rate. Mega-corporations such as General Motors and Ford Motor Company reported health care costs as their single largest expense. The health care costs of similar corporate giants doubled and even trebled as the decade came to a close (Jacobs, 1981).

Shephard (1982, p. 795) sums up the current situation succinctly when he states "there is therefore an economic motive for determining whether such interventions as employee fitness programmes have a beneficial effect upon worker productivity". These economic motives have fueled academic interest in the area of occupational fitness programs, the participants and its effects.

Perhaps no other issue has had a more profound effect on both the research and the development of occupational fitness programs than the subject of worker absenteeism. A popular
belief is that employee absenteeism is related in some degree to personal fitness levels. That in fact fitter employees are less likely to be absent than unfit employees. Several studies have indicated that an inverse relationship may indeed exist between physical fitness and absenteeism (Linden, 1969; Pravosudov, 1975; Donoghue, 1977; Shephard, 1979).

Two consistent observations permeate the literature:

1) Physically fit employees tend to be absent fewer days than unfit employees.

2) Regular participants of company fitness programs tend to be absent fewer days than non-participants.

Unfortunately, theory development has been slow and information as to the possible mechanisms behind these observations has been virtually non-existent (Fielding, 1982). The result has been a paucity of conclusive data to guide future research.

Previous studies of physical fitness and absence from work have used a kaleidoscope of research designs and techniques. These studies can be grouped into one of two broad themes in an effort to gain a better understanding as to the relationship between occupational fitness and absence from work.
1.20 Epidemiological studies

The pioneering work of Morris (1958) and Paffenbarger (1970, 1975), revealed through large scale epidemiological analyses, that significant correlations existed between 'on-the-job' fitness or physical activity requirements and the incidence of coronary heart disease. These classic studies suggested that physically fit employees possess certain physiological qualities which either inherently or through cultivation allow them to attend work with fewer incidences of absence.

This intuitively appealing hypothesis posits that physical fitness somehow increases an employees' resistance to disease, fatigue, injury and minor illness. Research guided by this viewpoint has attempted to show that physically fit employees are absent less frequently because of their superior level of fitness.

1.30 Participation-Adherence Studies

An alternate direction, pursued by Shephard and his researchers (1978, 1979, 1981) and Bjurstrom & Alexiou (1978), proposes that absenteeism may be inversely related to degree of participation and adherence to occupational fitness activities. Research directed by this viewpoint suggests that the relationship between occupational fitness and absence can be better described in terms of a psychosocial phenomenon rather than a physiological one.
Studies to date have attempted to uncover differences in absenteeism between regular adherents to the company exercise program and non-adherents and controls. Durbeck (1972) for example, reported that participants involved in group exercise activities showed greater fitness and attitudinal changes than participants exercising alone at home.

A second intuitively appealing hypothesis posits that workers enrolled in employee fitness activities derive some psychosocial benefit from participation and that this "boost in morale" (Shephard, 1979), affects their willingness and motivation to attend work. Fitness activity participants are better 'attenders' not because they have become fitter, but because the process of becoming fit has improved their morale. As a result of participating in company fitness programs, employees feel more positive about the company and themselves. This enhancement in attitude can also be affected by any new social relationships developed through the course of the group activities.

It is important to state that these two vistas are by no means mutually exclusive or all encompassing. It is entirely possible that both mechanisms (i.e. physiological and psychosocial) are operating to some degree in participants of employee fitness programs or alternatively, that neither mechanism is operating and that the previous observations merely reflect inappropriate research designs.
misinterpretation or some other unidentified reason.

1.40 Purpose of the Study

The purpose of this inquiry is not to offer a critique of the scientific method employed by previous researchers, for other authors have done so already (Folkins & Sime, 1981; Fielding, 1982). This paper will examine the theoretical bases of these two perspectives in the form of two distinct but inter-related essays.

The essays will approach the question of physical fitness and absence from work from the standpoint of ability to attend work (high fitness) and motivation to attend work (high morale). The theoretical map for both approaches will be the Steers & Rhodes (1978) Process Model. The Steers & Rhodes Model was chosen because of its simplicity and its widespread use in the literature. It is especially relevant when used as a theoretical template in which to fit previous studies of physical fitness and absenteeism.

1.50 Physical Fitness and Absenteeism

The first essay will deal with the issue of physical fitness and absence due to sickness and injury, from the perspective of ability to attend work (Steers & Rhodes, 1978). Although previous research has focused primarily upon measures of physical fitness and measures of sickness absence, they have all but ignored the wealth of research and theory from the behavioral and social science disciplines.
Little attempt has been made to integrate fitness observations with concepts such as learned cultural absence norms, social exchange, job satisfaction or personal variables. Other variables such as age, gender, length of service and company affiliation have unfortunately escaped scrutiny within the majority of published fitness studies. Any discussions of absenteeism as a behavioral phenomenon, whether purely physiological or otherwise which does not address at least some of these concepts, appears to be grossly deficient in scope (Chadwick-Jones, Nicholson & Brown, 1982).

The first essay will explore the relationship between physical fitness and employee sickness absence against the backdrop of the Steers & Rhodes (1978) Process Model. The model will allow the development of several hypotheses concerning the relationship between physical fitness and absence, and the relative effects of other variables such as age, gender, length of service and company affiliation.

Empirical support for these hypotheses will be sought in the form of a correlational analysis of data obtained from a large employee fitness program for the years 1979-1984.
The second major component of the Steers & Rhodes (1978) Process Model centers on motivation to attend work. Steers & Rhodes suggest that given an employee's physical ability to attend work, the next most critical factor affecting attendance is the employee's desire or willingness to attend.

Shephard's (1978, 1979) work provides empirical support for the idea that absenteeism is inversely related to the degree of participation and adherence to an occupational fitness program. His work definitely suggests that high fitness adherents (ie. employees who attend the fitness activities on a frequent basis) have a different pattern of absence than low fitness adherents and non-participants.

It is the purpose of the second essay to review the theoretical rationale behind the claims that degree of adherence and degree of participation in occupational fitness programs affects motivation to attend work. How plausible is this claim in the light of existing theory? The Steers & Rhodes (1978) Process Model, will again serve as a theoretical map in an effort to gain a better understanding of previous fitness research. Several hypotheses will be distilled from the literature and these hypotheses will be tested using data obtained from a questionnaire sampling of a
large employee fitness program.

It is the purpose of these essays to approach the question of physical fitness and absence from work from both the standpoints of ability to attend (ie. high fitness) and motivation to attend (ie. high morale). These concepts have been identified as critical components in the decision to attend work as put forth by the Steers & Rhodes (1978) Process Model.
2.10 Problems in Absence Research

Absenteeism, or absence behavior, as it is described in the psychological literature has been and is the subject of constant research. With lost working days in the U.S. and Canada running into the hundreds of millions annually and direct cost in excess of 30 billion dollars (Steers & Rhodes, 1980), absenteeism is of great concern to all members of society.

Unfortunately, several decades of absence research have yielded scant information as to the causal determinants of employee absenteeism. Most studies have been able to describe a set of conditions under which absences are more or less likely to occur, but have been unable to explain why absences are more or less likely to occur. The majority of the studies consist of bivariate correlations of different sets of variables and subsequent absenteeism (Vroom, 1964, Chadwick-Jones, Nicholson, & Brown, 1976; Muchinsky 1977).

To date only three studies out of the many hundred found in the literature have attempted to develop a theoretical framework to guide future research. These are the original Gibson (1966) Model (figure 2.1), the Steers & Rhodes (1978) Process Model
(figure 2.2) and the most recent psycho-social approaches of Chadwick-Jones, Nicholson and Brown (1982). Of these, the Steers and Rhodes Model is, by far, the most widely cited in the literature.
FIGURE 2.1—Schematic Representation of Contractual Relationships Between the Individual and the Organization.

NOTE: The arrows represent presumed relationships. No attempt has been made to represent feedback relationships.

FIGURE 2.2.—Major Influences on Employee Attendance

1. Job Situation
   - Job scope
   - Job level
   - Role stress
   - Work group size
   - Leader style
   - Co-worker relations
   - Opportunity for advancement

2. Employee Values & Job Expectations

3. Personal Characteristics
   - Education
   - Tenure
   - Age
   - Sex
   - Family size

4. Satisfaction with Job Situation

5. Pressure to Attend
   - Economic/market conditions
   - Incentive/reward system
   - Work group norms
   - Personal work ethic
   - Organizational commitment

6. Attendance Motivation

7. Ability to Attend
   - Illness & accidents
   - Family responsibilities
   - Transportation problems

8. Employee Attendance

Why have theories of absence behavior proved so difficult to come by? It may be useful at this time to briefly review some of the major problems confronting absence research.

A fundamental problem concerns the very nature of the dependent variable itself. What exactly is absenteeism? No uniform operational definition exists, despite the literally hundreds of measures reported by behavioral scientists (Steers & Rhodes, 1978; ERS Services, 1980, Chadwick-Jones, Nicholson & Brown, 1982).

2.20 Voluntary and Involuntary Absence

A major stumbling block is the inability to distinguish between involuntary absence; defined as illnesses, accidents and transportational difficulties, and voluntary absence; defined as a voluntary decision not to attend.

From a conceptual format, these constructs are quite distinct, one is behavioral, the other is not, but problems arise during the measurement phase. Chadwick-Jones, Nicholson & Brown (1982) report 100 different measures of absence behavior. Moreover, it is estimated that even the measurement of sickness absence is likely highly contaminated by data from other absence sources. (Industrial Society Conference, 1968).
In addition to the problem of what to measure, the problem of how to measure has also hampered research. Debate continues as to the relative merit of using frequency measures, total time measures, severity measures or a combination of the three. Some have argued that total time measures best reflect cases of involuntary or sickness absence, while the frequency measures best reflect behavioral indices of absenteeism (Chadwick-Jones, Nicholson & Brown, 1982).

Several other problems peculiar to this area of inquiry have also handicapped progressive research. Corporations and trade unions have been traditionally uncooperative with researchers and access to good data has been very limited (Mickilachi, 1977). Chadwick-Jones, Nicholson & Brown (1982) reported some reluctance on the part of certain corporations to grant access to interview or question employees. It is not surprising that research has proceeded slowly considering the magnitude of these obstacles.

Two widely held, yet unfounded assumptions concerning absenteeism, have in the opinion of many, hindered rather than guided current research (Chadwick-Jones, Nicholson & Brown, 1976, 1982; Steers & Rhodes, 1978).
In the first place, much of the current literature assumes that job dissatisfaction represents a primary cause of absenteeism. Research does not provide much support for this assumption. Chadwick-Jones, Nicholson & Brown (1976, P.734) in reviewing 29 studies concluded that "at best, it seems job satisfaction and absence from work are only tenuously related". Similar findings were reported in an Educational Research Services (1980) report of 25 studies.

Secondly, much of the current research is based on the principle that employees are free to choose whether or not to attend work (ie. voluntary absence). This is often not the case (Herman, 1973), as situational determinants frequently supercede the employees voluntary choice. As Steers & Rhodes (1978 P. 392) explain: "a comprehensive model of attendance must include not only job attitudes and other influences on attendance motivation, but also situational constraints that inhibit a strong motivation - behavior relationship".

2.30 The Steers & Rhodes Process Model

The Steers & Rhodes (1978) model identifies two broad dimensions influencing employee absence behavior. These are: 1) the employee's ability to attend work and, 2) the employee's motivation to attend work.
2.31 Ability to Attend Work

Steers & Rhodes (1978) cite as a major weakness in current absence research, the inability or failure to account for involuntary absence in the study of voluntary absence. They argue successfully that even in cases where an individual is motivated to come to work, there are instances where attendance is just not possible. It is argued that in at least three sets of conditions, the individual has at his or her disposal, very little choice (Herman, 1973). These conditions can be identified as: a) illness and accidents, b) family responsibilities, and: c) transportational problems.

The first two conditions are particularly relevant to this inquiry and will be discussed in some detail. The third (transportational problems) is generally viewed as being less important and has even been discounted as being influential by some (Nicholson & Goodge, 1976).

Illness and Accidents

Poor health and accidental injury represent the primary cause of absenteeism (Hedges, 1977). In general, measures of sickness absence are highly correlated with measures of total absence.

It is therefore reasonable to suggest that 'unhealthy employees will show greater incidences of absence due to
illness than 'healthy employees'. This viewpoint suggests that employees engaged in non-health enhancing behavior will show greater incidences of sickness absence than more 'healthy' co-workers. Examples of this would be the observations that smokers show higher incidences of sickness absence over non-smokers (Luce & Schweitzer, 1978), or that alcoholism and drug abuse are related to absence behaviour (Yolles, 1975).

The concept that physiological fitness is important in this regard fits well with this aspect of the model.

**Family Responsibilities**

A second powerful constraint on work attendance is that of familial responsibilities (Steers & Rhodes, 1978). Although the degree of responsibility may be determined largely by personal variables such as age, family size, marital status and socio-economic status, the most important factor is gender. **Women as a group are absent more than men for all categories of absence** (Hedges, 1973; Sylwester, 1979).

This fact is not surprising given the role of the female in the traditional family unit. It is likely that the wife or mother will care for sick children, necessitating absence from work. Perhaps increased exposure to illness increases the females' susceptibility to falling ill, although this has not been well documented.
Steers & Rhodes (1978) note that as females get older and progress in their work career the incidence of sickness absence decreases. They suggest that perhaps this is due to the reduction in familial responsibilities associated with young children. In contrast males demonstrate increased sickness absenteeism with age (presumably due to health reasons), while non-sickness absenteeism does not change.

2.32 Motivation to Attend Work

The fundamental premise of the Steers & Rhodes (1978) conceptual model posits that an employee's motivation to attend work represents the primary influence on actual attendance, assuming the employee has the ability to attend (Herman, 1973).

If this premise can be accepted (see Chadwick-Jones, Nicholson & Brown, 1982 for a critique), then questions must be raised concerning the factors which are likely to influence an employee's motivation to attend. Steers & Rhodes (1978) propose that such motivation is determined largely by: a) an employee's effective responses to the job situation and, b) various internal and external pressures to attend. Physical fitness programs have addressed the former condition in an attempt to improve both an employees job situation and his/her perception of that situation. It is also conceivable that employee fitness programs can affect pressure to attend by influencing personal work ethics, work
group norms and organizational commitment.

Although the Steers & Rhodes (1978) model represents a serious attempt to integrate many of the observations found through previous research, it is obviously not perfect. A major criticism is that by reducing absence behavior to the level of two simple constructs: a) ability to attend and, b) motivation to attend, that an oversimplification of the process is portrayed (Chadwick-Jones, Nicholson & Brown, 1982).

Furthermore, it has been argued that the Steers & Rhodes model (1978) sheds little light on the problem of learned absence norms and the whole issue of influence by labor unions. It is acknowledged that these factors probably determine the "learned absence culture" specific to each organization or type of work. It is plausible that individual abilities and motivations to attend are influenced by norms within the specific work-group and what is allowed within the collective agreements.

However, the simplicity of the Steers & Rhodes (1978) model and its popularity within the literature allow for a useful point of departure for the ensuing discussions on occupational fitness and absenteeism.
PART I

PHYSICAL FITNESS AND ABSENTEEISM
CHAPTER THREE
ABILITY TO ATTEND: PHYSICAL FITNESS AND ABSENCE FROM WORK

3.10 INTRODUCTION

The Steers & Rhodes model identifies the ability to attend work as being an important factor in determining employee absenteeism. Steers and Rhodes (1978) suggest that a major weakness inherent in much of the absence literature is the inability to partial out involuntary and voluntary absenteeism. This essay will deal with the question of physical fitness and involuntary absence.

The basic premise behind this concept is that even if an employee wants to come to work (ie. high motivation) he or she may have little discretion in the matter (Steers & Rhodes, 1978).

3.20 Review of the Literature

A basic tenet underlying the popularity of physical fitness programs in North American business and industry is the assumption that an employee's degree of absenteeism can in some way be influenced by his or her level of personal physical fitness, that in fact, fitter employees show different degrees of absenteeism in relation to less fit co-workers involved in similar occupational tasks. Fitness in this context is defined in terms of estimated oxygen
carrying capacity or MV02.

Donaghue (1977) in a review of literature suggests that compelling evidence exists to support the hypothesis that physical fitness and absenteeism are inversely related.

The available research implies that 'fit' employees tend to be absent fewer days and for shorter durations than 'unfit' employees.

Absence in this context generally has consisted of sickness and injury time off work.

There is general agreement that regular exercise elicits certain physiological changes within the body (DeVries, 1972, Astrand, 1977). The issue which is unclear at this time is if these physiological differences between physically fit employees and physically unfit employees are correlated in any way with degrees of absence of the respective groups.

Early evidence linking physical fitness with decreased absence, focussed on morbidity and mortality statistics between workers engaged in occupations requiring regular physical activity and those engaged in occupations that were for the most part, sedentary. Morris (1958), in a now classic study published in the *Lancet* and the *British Medical Journal*, found that postmen and bus conductors employed in the British Civil Service, suffered 50% fewer heart attacks than their sedentary counterparts, the postal clerks and bus drivers. On the basis of these and other observations, a
hypothesis was developed, stating "that men in physically active jobs have a lower incidence of coronary (ischaemic) heart disease in middle age than men in physically inactive jobs. More important, the disease is not so severe in physically active workers, tending to present in them in relatively benign forms" (Morris, 1958, p. 511).

A decade later more support for Morris' hypothesis was revealed through a longitudinal study on American longshoremen. Paffenbarger's (1970, 1975) classic 22 year longitudinal study examined the CHD mortality statistics of 6351 males aged 35 to 74 years of age between the years 1951 to 1973. Workers were classified on the basis of 'on-the-job' energy outputs (light, moderate, or heavy). Paffenbarger found that the age adjusted coronary death rate for the high activity category was 26.9 per 10,000 work years, contrasting sharply with figures of 56.3 for the moderate and 49.0 for the low activity category. More significantly, it was reported that a protective 'threshold' effect was seen for the sudden death syndrome, in which the incidence of mortality for the heavy workers was only 5.6 as opposed to 19.9 for moderate and 15.7 for light. The authors concluded that "repeated bursts of high energy output established a plateau of protection against coronary mortality" (Paffenbarger, 1975, pp. 545-550).

Similar findings had been reported by Zukel on
farmers and Karvonan (Donaghue, 1977) on lumber jacks. These results are generally consistent with the widely held belief that exercise has preventative and therapeutic benefits in the treatment of CHD among middle aged males. The epidemiological work site studies do generally support the hypothesis that on the job physical activity is associated with lower death rates from coronary heart disease.

Several authors have attempted to show that an employee's level of physical fitness can be predictive in the assessment of future health care utilization (Quasar 1976: Shephard, 1982).

The Quasar (1976) study was a series of large sample (n = 236; n = 546; n = 900 and n = 387 correlation analyses of physical fitness as assessed by submaximal testing and health care system utilization (Ontario Health Insurance Plan). The research hypotheses were generalized from the previous work on morbidity/mortality from CHD and stated basically that if people that are fit generally recover from illness more quickly than those who are unfit, then fitter people should incur lower costs in recovering from illness. These reduced costs should be manifested in the health care utilization record. The results were somewhat disappointing as only very moderate negative correlations were found between fitness levels and subsequent medical costs. The associations were more significant when expected direct and total costs for
coronary heart disease were assessed using the Framingham equations; however, even these did not exceed the modest level \( r = -0.49 \).

Shephard (1983) attempted a replication study using participants of a large employee fitness program and Ontario Health Insurance Plan records. This study was the first longitudinal study of the effects of an employee fitness program upon health care costs. Shephard found that the employees of the 'fitness group' had lower health care costs over a 'control group' in a control insurance company.

Shephard's study reviewed the health care utilization costs of 94 men and 134 women participating in a pilot employee fitness program during 1977 and 1978. Statistically significant but weak correlations were found:

1. Exercise heart rate associated with hospital utilization.
2. \( VO_2 \) max, higher in subjects with reduced health care costs.

The study reported that only very slender relationships could be found between health care savings and either gains in fitness or favorable changes in lifestyle among program participants.

Shephard (1983 p. 54) concluded that "The most probable explanation is that health care costs accumulated by normal working employees related to minor ailments, real or
imaginary, where there is little reason to suppose that a gain of fitness would have a direct beneficial effect."

Likewise, the questions used in the health hazard appraisal focus mainly upon major illness and death rather than minor ailments. Shephard's point is well taken, as the majority of the correlational studies have found inverse associations between physical activity and fitness with coronary heart disease, rather than minor illness (Morris 1958, Paffenbarger 1970, Quasar, 1976). A widely quoted paper on the subject of fitness and sickness absence is that of Pravosudov (1976). He notes that epidemiology studies performed in the Soviet Union have revealed significant associations between physical fitness and reduced sickness and absence.

The Russian studies report that regular exercisers consulted physicians on the average four to five times less than non-exercisers; that the exercisers reported less severe illness; and that their impairment from work was greatly reduced. These effects were even more pronounced in elderly employees. Pravosudov (1976) indicates that exercising workers are less likely to develop complications from the flu and colds, resulting in a reduced risk of absenteeism due to chronic respiratory illness.

Bjurstrom & Alexiou (1978) studied the personal sick leave absences of 800 employees of the New York State Education Department. Their results indicated that men and
women involved in the employee fitness program showed a reduction in personal sick leave over the previous year when no program existed. Even though 55% of the participants showed a drop in sick leave during the fitness year, 45% of the participants showed no change or an increase in sick leave during the same period. Little reference however who given to the differences, if any, between regular adherents and dropouts. Relative gains in fitness vs sick leave were not mentioned and no mention was made regarding the overall organization's absence and sickness trends of the year's being compared. The authors, however, concluded that "a net reduction of 4.7 hours/employee/year was demonstrated when sick leave data for all participating employees was compared for the control year vs the program year" (Bjurstrom & Alexiou, 1978, p. 526).

Evidence does exist therefore to suggest that perhaps physical fitness and sickness absence maybe inversely associated, and that the basis for this association may be physiological (Pauley, 1982).

Linden's (1969) pioneering study compared the physical fitness of customs officers, firemen and office employees with their sick leave records. Linden's results indicated that at least one group (51 customs officers) showed a significant negative association between fitness and absence. The negative associations of the other groups failed to
achieve statistical significance, although his sample sizes' were relatively small. This study was the first published study to demonstrate associations between MVO2 and sickness absence.

Several trade publications have also offered anecdotal and descriptive evidence to give further credence to the hypothesis that physical fitness and sickness absence are in fact inversely related.

An analysis of health care claims by Control Data Corporation revealed that employees not engaged in regular, moderate or vigorous exercise were more likely to incur higher annual health care costs relative to employees engaged in regular exercise. Furthermore, the inactive employees were averaging more hospital visits per year (0.57 hospital days vs 0.37) (Fielding, 1982).

Low back pain and lower back injuries account for a significant portion of sickness absences and benefit case absences. It is estimated that low back injury is present in 30 per cent of the American workforce, even excluding chronic and degenerative type injuries (Fitness Systems Inc., 1984).

Cady et al (1979) reported significant differences in the incidence of back injuries between fit and unfit firefighters in the Los Angeles area. The group deemed 'least fit' in this study demonstrated 10 times more back injuries than
those classified as most fit'.

Lockheed Missiles and Space Company reported that it had saved an estimated $1 million in life insurance premiums since the initiation of its employee wellness program in 1978 (Bujon, 1983).

An important point to consider when interpreting this data is the observation that perhaps as much as 36% of all sick leave absences are 'uncertificated', meaning that a physicians diagnosis is not required (Strasser, 1980, 1981, Chadwick-Jones, Nicholson & Brown, 1982).

This fact, combined with the fact that many physicians are likely to grant a certificate on the 'patient's word' alone, further compounds the difficulty in measuring the dependent variable (Industrial Society Conference 1968; Strasser, 1980, 1981).

At this point, it is difficult to assess how much of the sickness absence measured by previous studies is in fact due to 'legitimate physiological illness' and how much is due to reasons more fully addressed in Chapter Seven.

Notwithstanding methodological and measurement problems, the bulk of the available literature seems to support the premise that fit employees are likely to show reduced absence over unfit employees.

**Hypothesis:** 1.1 Physical fitness as measured by estimated sub-maximal MVO₂ will be negatively correlated with
sickness absence and absence due to injury.

Previous studies of physical fitness and absenteeism have not commented on the possible effects of variables such as gender, age, length of service or company affiliation.

Fortunately though, much of this information is readily available in the psycho-social literature on absence behavior. It seems relevant to comment on the possible effects of these variables when discussing the relationship between physical fitness and absenteeism.

3.30 Effects of Gender - Females - Females are traditionally absent about twice as often as men engaged in similar occupational tasks (Hedges, 1973; Sylwester, 1979). This issue will be discussed at greater length in the second essay.

Females generally have lower values of $\text{MVO}_2$ even when corrected for body mass (Astrand, 1977). These two variables and gender, can work in tandem to produce a significant inverse relationship between fitness and absenteeism where one does not exist. An example of this would be to combine both male and female $\text{MVO}_2$ data and attempt to interpret any correlations which may be present. (Figure 3.1)
FIGURE 3.1
MVO₂ VS ABSENCES IN MALES AND FEMALES

M  M  M
M  M  M
MVO₂  M  M  F  F  F
F  M  F  F
F  M  F  F  F
F

0 Absences

The scatterplot shows that although there may be no correlation between fitness and absenteeism when gender is partialled out, by combining the data it is very likely that an inverse correlation will be found. This correlation is due solely to the gender differences in MVO₂ and absence scores of the two groups.

Hypothesis: 1.2 Females as a group will show greater absence than males.

Hypothesis: 1.3 MVO₂ and absence scores will have negative correlation, after effect of sex and weight has been removed.

Hypothesis: 1.4 The strength of the inverse correlation between physical fitness and absenteeism (if it exists) will decrease when the two groups are analyzed separately.

3.40 Effects of Age - In the general population physical fitness declines with increasing age (Devries, 1972). It is not exactly clear which variables are more important in
determining this decline i.e. the aging process itself or general lack of physical activity.

The relationship between absence and age has also received some attention in the literature. Hedges (1973) has summarized national data of American non farm workers.

Hedges' data shows that in the case of part-time workers, absences decrease with age, while in the full-time workers, absences increase with age.

Some studies have found a curvilinear relationship between absence and age, with middle aged workers having the lowest absences (Jackson, 1944; Taylor, 1979).

Nicholson, Brown and Chadwick-Jones (1977) in a review of 29 studies concluded that:

1) Voluntary absences are often inversely related to age with the effect more pronounced in males.

2) The relationship between involuntary absence (Chapter 2, p.10) and age is not clear. Results may be negative, positive or curvilinear.

Muchinsky and Garrison (1977) and Bernardin (1977) noted negative correlations between unpaid absences and age. Ilgen & Hollenback (1977) also reported negative associations between unpaid absences and age. These results seem to suggest that as an employee gets older, they are less likely to take off unpaid sick days.

Hypothesis 1.5 Unpaid absences (sickness and injury) will be
inversely correlated with age. This effect may be more pronounced in male employees.

3.50 Length of Service - There is no conclusive evidence in the literature regarding associations between absence and length of service.

Some studies have reported negative associations (Jackson, 1944) while others have reported positive associations (Martin, 1971). The nature and degree of the relationships appear to be specific to the population being studies, with white collar and blue collar workers showing different trends (Metzner & Mann, 1953).

Garrison and Muchinsky (1977), however, noted an interesting relationship between length of service and the differences between paid and unpaid absences. They found using a sample of white collar workers, that although a positive association existed between length of service and paid absences, a negative association existed between length of service and unpaid absences.

They hypothesized that long service employees are more likely to have eligibility for paid absences where new employees do not have that option and must take time off in the form of unpaid absences.

Since age is likely highly associated with length of service, it is difficult to assess the effects of these two variables independently. Bernardin (1977) partialled out age
effects and found a negative association between length of service and absence.

Hypothesis 1.6 Unpaid absences will be inversely correlated with length of service.

3.60 Company Affiliation - The recent work of Chadwick-Jones, Nicholson and Brown (1982) supports the premise that supervisors and regular line employees will show different degrees of absence based largely on their relative positions within the organizational structure. It is important to consider the following points when interpreting the fitness and absence results:

1) Supervisors as a group are often given special privileges, and have greater task flexibility than regular line workers. Their absences are less likely to be noticed and they may be able to incorporate 'personal chores' into their work day without having to declare formal absences.

2) Absences are primarily a blue-collar phenomenon. (Chadwick-Jones, Nicholson & Brown, 1982).

Hypothesis 1.7 Classified personnel as a group will have higher absences than management personnel for all categories of absence.
CHAPTER FOUR

METHODS

4.10 Research Plan - The data to be used for this study consisted of personal fitness assessments of 294 regular full-time employees of a large Canadian utility company. This data was collected for the years 1979 through 1984 with approximately equal numbers of subjects tested every year. Since this study is not an experimental study, but is an exploratory one in nature. The correlational analyses do not imply causation or direction but only point to possible associations between the variables under analysis. It is hoped however, that an exploratory correlational analysis of data will indicate new areas for future experimental research.

4.20 Subjects - Subjects for this study consisted of a sample of unsolicited employees who voluntarily requested a sub-maximal test of physical fitness during the years 1979 through 1984. Subjects were encouraged to return for a re-test following 4 - 6 months, although re-test data was not used in this study.

The total sample size for this study was n = 294. This represented all employees volunteering for a sub-maximal test of physical fitness for the 5 year period. Approximately equal numbers were tested each year.
Of the 294 employees tested, 173 were male, representing 58.8% of the total sample. There were 121 females, representing 41.2% of the total sample.

Of the 294 employees tested, 135 were management or supervisory personnel. The group accounted for 45.9% of the total sample. The remaining 159 employees were union or "classified" personnel. This group accounted for 54.1% of the total sample.

All subjects in the sample completed the physical fitness evaluation in its entirety.

It is acknowledged that these categories of absence are not totally exclusive and that some overlap may occur between the different categories. It is assumed however, that the record of absences represents a reasonable account of the events as they occurred in nature.

Organizational permitted behaviors such as personal leave time and annual vacation absences were not deemed relevant for the purposes of this study and were therefore excluded.

4.30 Physical Fitness Measurement - The physical fitness of the subjects was assessed using sub-maximal bicycle ergometry (Astrand Protocol) and an age-sex corrected nomogram (Astrand, 1977).

- Skin fold measurements were collected at four body sites (Durnin & Wormersley, 1974) and percent body fat was calculated.
- Subjects ages were obtained through self report.
- Subjects were weighed on a medical type scale in shorts and stockings.

4.40 Absence Measurement - Multiple measures of absenteeism were computed for each employee. Absence frequency was not calculated as it was not available for study.

Total days absent was defined as the sum of the total days absent for each category used.

For the purpose of this study, only those categories of absence pertaining directly to sickness or injury related absence were used.

Four groups of sickness and injury absence were defined.

GROUP I - Total Absence (All categories combined)

GROUP II - Sickness (unpaid)
   1) AS Sickness Absent Unpaid
   2) AU Miscellaneous Absent Unpaid

GROUP III - Sickness (paid)
   1) PS Sickness absent Paid
   2) AE Excused absent Paid

GROUP IV - Injury (paid)
   1) AI Absence injury Paid
   2) BC Benefit continuation Paid

Each category was expressed in terms of days lost per employee. A typical absence record for a subject is expressed as follows:
<table>
<thead>
<tr>
<th>Sex</th>
<th>Occupation</th>
<th>Age</th>
<th>Annual Absence Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>46</td>
<td>AE AU AS PS BC AI TOTAL DAYS</td>
</tr>
</tbody>
</table>

4.50 Procedures

The Statistical Analysis System (SAS) was used to analyze the physical fitness and absence data.

Analysis consisted of Pearson Product Moment Correlation.
CHAPTER FIVE

Results

The Steers & Rhodes (1978) Process Model postulates that an individual's attendance and absence behavior is affected by the "ability to attend". This notion suggests that persons with inferior health or with actual physical problems getting to work will show greater degrees of absenteeism. Conversely, the epidemiological and physiological worksite studies postulate that individuals with superior health levels should demonstrate reduced absence behavior. The purpose of Part I is to find support for these hypotheses in the form of data obtained from a specific employee population.

The data for this study used five groups based on gender and job classification. Group I is comprised of all subjects tested in this study with no distinction made between gender or job classification. Groups 2 and 3 consisted of male and female groups. Groups 4 and 5 consisted of management and classified (union) personnel. Means and standard deviations for the physical fitness and absence variables are presented in Table 5.00. Fitness as measured by MVO₂ is expressed in terms of milliliters of oxygen per unit of body weight. Age of subjects is expressed in years. The subject's body weight
is expressed in kilograms and body fat is expressed in terms of a percentage of overall body mass. Length of service is expressed in terms of years of service with the present employer.

5.10 **Hypotheses 1.1, 1.3 and 1.4**

Hypothesis 1.1 states that physical fitness (measured by estimated submaximal MVO$_2$) will be inversely correlated to sickness and injury absence. This was tested using Pearson Product Moment Correlation (PPMC). Correlation coefficients for MVO$_2$ and measures of absence are presented for the five respective groups in Table 5.10.
<table>
<thead>
<tr>
<th>Fitness Variables</th>
<th>Absence Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of</td>
<td>MVO$_2$</td>
</tr>
<tr>
<td></td>
<td>Weight</td>
</tr>
<tr>
<td></td>
<td>% Fat</td>
</tr>
<tr>
<td></td>
<td>Age</td>
</tr>
<tr>
<td></td>
<td>Service</td>
</tr>
<tr>
<td></td>
<td>AS</td>
</tr>
<tr>
<td></td>
<td>AU</td>
</tr>
<tr>
<td></td>
<td>PS</td>
</tr>
<tr>
<td></td>
<td>AE</td>
</tr>
<tr>
<td></td>
<td>AI</td>
</tr>
<tr>
<td></td>
<td>BC</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group 1 MEAN</th>
<th>37.40</th>
<th>67.95</th>
<th>20.20</th>
<th>33.10</th>
<th>6.80</th>
<th>0.76</th>
<th>0.16</th>
<th>3.33</th>
<th>0.93</th>
<th>0.33</th>
<th>0.07</th>
<th>5.93</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n=294) S.D.</td>
<td>8.40</td>
<td>14.03</td>
<td>6.80</td>
<td>9.00</td>
<td>6.70</td>
<td>1.34</td>
<td>0.96</td>
<td>3.58</td>
<td>1.44</td>
<td>1.22</td>
<td>1.05</td>
<td>6.69</td>
</tr>
<tr>
<td>Group 2 MEAN</td>
<td>37.50</td>
<td>74.95</td>
<td>19.60</td>
<td>34.33</td>
<td>7.62</td>
<td>0.53</td>
<td>0.08</td>
<td>2.79</td>
<td>0.71</td>
<td>0.24</td>
<td>0.00</td>
<td>4.60</td>
</tr>
<tr>
<td>(n=173) S.D.</td>
<td>8.60</td>
<td>10.62</td>
<td>5.10</td>
<td>8.80</td>
<td>7.62</td>
<td>1.13</td>
<td>0.43</td>
<td>3.35</td>
<td>1.09</td>
<td>1.08</td>
<td>0.00</td>
<td>5.30</td>
</tr>
<tr>
<td>Group 3 MEAN</td>
<td>37.21</td>
<td>57.88</td>
<td>21.05</td>
<td>31.26</td>
<td>5.69</td>
<td>1.08</td>
<td>0.28</td>
<td>4.09</td>
<td>1.26</td>
<td>0.47</td>
<td>0.18</td>
<td>7.84</td>
</tr>
<tr>
<td>(n=121) S.D.</td>
<td>8.24</td>
<td>7.93</td>
<td>3.74</td>
<td>9.01</td>
<td>4.98</td>
<td>1.55</td>
<td>1.40</td>
<td>3.79</td>
<td>1.79</td>
<td>1.40</td>
<td>1.64</td>
<td>7.91</td>
</tr>
<tr>
<td>Group 4 MEAN</td>
<td>38.13</td>
<td>69.83</td>
<td>19.70</td>
<td>34.38</td>
<td>8.15</td>
<td>0.08</td>
<td>0.01</td>
<td>2.76</td>
<td>0.81</td>
<td>0.12</td>
<td>0.00</td>
<td>3.91</td>
</tr>
<tr>
<td>(n=135) S.D.</td>
<td>8.60</td>
<td>12.04</td>
<td>4.62</td>
<td>7.50</td>
<td>7.56</td>
<td>0.45</td>
<td>0.11</td>
<td>3.10</td>
<td>1.33</td>
<td>0.74</td>
<td>0.00</td>
<td>4.16</td>
</tr>
<tr>
<td>Group 5 MEAN</td>
<td>36.69</td>
<td>66.35</td>
<td>20.64</td>
<td>32.00</td>
<td>5.71</td>
<td>1.33</td>
<td>0.29</td>
<td>3.80</td>
<td>1.04</td>
<td>0.52</td>
<td>0.14</td>
<td>7.65</td>
</tr>
<tr>
<td>(n=150) S.D.</td>
<td>8.27</td>
<td>13.15</td>
<td>4.66</td>
<td>10.00</td>
<td>5.70</td>
<td>1.56</td>
<td>1.29</td>
<td>3.90</td>
<td>1.53</td>
<td>1.50</td>
<td>1.43</td>
<td>7.87</td>
</tr>
</tbody>
</table>
Table 5.10

Correlations Between Measures of Absence and NVD

<table>
<thead>
<tr>
<th>Absence Variables</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
<th>Group 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(combined)</td>
<td>(males)</td>
<td>(females)</td>
<td>(management)</td>
<td>(classified)</td>
</tr>
<tr>
<td>Unpaid Sickness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AS</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
<td>0.18*</td>
<td>ns</td>
</tr>
<tr>
<td>AU</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
<td>0.18*</td>
<td>ns</td>
</tr>
<tr>
<td>Paid Sickness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AE</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>PS</td>
<td>-0.10</td>
<td>-0.12</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Paid Injury</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AI</td>
<td>-0.14</td>
<td>-0.11</td>
<td>-0.19*</td>
<td>ns</td>
<td>-0.17*</td>
</tr>
<tr>
<td>BC</td>
<td>-0.10</td>
<td>ns</td>
<td>-0.16</td>
<td>ns</td>
<td>-0.13</td>
</tr>
<tr>
<td>Total Absence</td>
<td>-0.11</td>
<td>-0.11</td>
<td>-0.14</td>
<td>ns</td>
<td>-0.14</td>
</tr>
</tbody>
</table>

*p < 0.05
**p < 0.01

Correlations less than 0.10 were not reported.
5.11 **Total Sample Results** - the Steers & Rhodes Model suggests that subjects with low fitness (i.e. lower ability to attend) will demonstrate greater absences. The fitness worksite studies suggest that subjects with high fitness will show fewer absences. There appears to be positive support for this proposition, within very narrow limits. It was observed that MVO₂ is inversely correlated to Total Absence ($r = -12$, $p<0.05$). The correlation is significant but very modest in size. No other measures of absence individually, were significantly correlated with MVO₂.

5.12 **Gender Differences (Groups 2 and 3)** For the male sample, none of the correlations between MVO₂ and measures of absence were different than zero. Males generally are absent only about half as often as females. In sedentary, white collar occupations they would appear to form a very select group and it would be unlikely to find significant correlations between fitness and absence (Linden, 1969).

The female group however exhibited a greater degree of absence behavior. Significant correlation was found between MVO₂ and a measure of Paid Injury Absence (AI), ($r = -0.19$, $p<0.05$). A second measure of Paid Injury Absence (BC), just failed to reach significance ($r = -0.16$). No further correlations between MVO₂ and
measures of absence were found to be significant. The Quasar Systems (1976) study also found significant inverse correlations between MVO₂ and health care utilization (a measure of illness) only in their female group. Hypotheses 1.3 and 1.4 state that as effects of gender are accounted for, strength of inverse correlations between MVO₂ and absence will decrease. This point was brought up in Chapter 3, where it was noted that males on average have higher MVO₂ scores and lower absences. Conversely, females on average have lower MVO₂ scores than males, and greater absences. This gender factor could have the effect of producing significant inverse correlations between MVO₂ and absence if these two groups are analyzed together instead of separately.

Support was found for these hypotheses as the significant inverse correlation between MVO₂ and Total Days Absent disappeared when the groups were analyzed separately.

5.13 Company Affiliation (Groups 4 and 5)

Since previous literature on fitness and absence has not commented on any possible relationships between job classification and the variables under consideration, this study proposed the management and classified workers.

The above literature indicates that supervisors or management personnel generally show low levels of absence.
As discussed earlier, absenteeism is a class related phenomenon (Chadwick-Jones, Nicholson & Brown, 1982). One would expect that since management personnel form a select "low absence" group, that there probably will be no significant correlations between MVO$_2$ and absenteeism in this group. This was supported by the correlational analysis of the management only data. No significant correlations existed in this group between MVO$_2$ and measures of Total Absence, Paid Sickness Absence or Paid Injury Absence.

MVO$_2$ however was significantly correlated with Unpaid Sickness Absence; AS ($r = 0.18$, $p < 0.05$) and AU ($r = 0.18$, $p < 0.05$). This correlation was unexpected because it was a positive correlation (ie. fitter management personnel tend to have more unpaid days). Fitter managers may be more inclined to take unpaid days to attend leisure and sporting activities. There is some evidence to suggest that socioeconomic level is related to participation in leisure sports (Montoye, 1975).

The absence literature indicated that classified or union personnel should show greater absence behavior than managers. One would expect then that correlations between MVO$_2$ and absence will be greater in this group than in the previous group. The results did not support this
viewpoint. \( \text{MVO}_2 \) was inversely correlated to Paid Injury Absence AI \((r = -0.17, p<0.05)\). No significant correlations existed between \( \text{MVO}_2 \) and measures of Total Absence, Paid Sickness Absence and Unpaid Sickness Absence.

To summarize this section, the results of the correlational analysis appears to support the hypothesis that \( \text{MVO}_2 \) and sickness absences are inversely related. In the total group sample a modest correlation was found between \( \text{MVO}_2 \) and Total Absence. The correlation disappears completely in the male only sample. In females \( \text{MVO}_2 \) is inversely correlated with paid injury absence. Again it should be stated that the correlations are small. In the management data, \( \text{MVO}_2 \) is significantly correlated with measures of Unpaid Sickness Absence. The direction of this correlation is positive, indicating that fitter managers take off more unpaid absence days. In classified employees \( \text{MVO}_2 \) appears to be inversely correlated with Paid Injury Absence. These results support the premise that at least in sedentary office workers, \( \text{MVO}_2 \) is very weakly associated with better attendance and reduced absence.

5.20 Hypotheses 1.2 and 1.7

A major criticism of fitness and absence studies in general is their failure to account for differences in the populations being studied. The absence literature supports
the view that females are absent more than males (ie. gender effect) and the view that classified personnel are more absent than management personnel (ie. company affiliation effect). Since this thesis argues that these effects should be considered when results are interpreted, it was important to test if the observations in the literature were supported by this data.

A series of T-tests were performed on the male-female and management-classified data to ascertain if the differences in absence means between the groups was in fact statistically significant. A single multivariate measure (Hotellings $T^2$) was used to ascertain if the means of the three sub-measures of Total Absence (ie. Unpaid Sickness, Paid Sickness and Paid Injury) were in fact different in males and females and management and classified. Males showed a mean Total Absence of 4.59 days per year while females showed a mean total absence of 7.84 days per year. This difference was statistically significant ($p<0.0001$, $T=3.93$).

Management employees showed a mean Total Absence of 7.65 days per year. This difference was statistically significant ($p<0.0001$, $T=5.20$). Hotellings $T^2$ revealed $F (3,290)=20.46$ for the management-classified groups. These differences were statistically significant ($p<0.0001$). Support for hypotheses 1.2 and 1.7 indicate
that absences means between male-female and management-classified populations are potentially different, necessitating separate treatment of the data.

5.30 Hypotheses 1.5 and 1.6

The review of literature suggested that age and length of service would be correlated with absence behavior. As employees get older or increase their tenure with the company, the incidence of them taking unpaid absences decrease. The reason is very simple. As employees increase their length of tenure, they are often allowed more paid time off in the form of personal leave days, increased vacation etc. Long service employees have the option of using paid days for their absences, whereas new employees do not generally have this freedom. Older employees may also take their jobs more seriously and be less likely to take "uncertified" days off. Age and length of service, because they are highly intercorrelated should therefore be inversely correlated with unpaid absences. This was tested using Pearson Product Moment Correlation. Correlational coefficients for Age-Length of Service and measures of absence for the respective data groups are presented in Tables 5.20 and 5.30.
Table 5.20
Correlations Between Measures of Absence and Age

<table>
<thead>
<tr>
<th>Absence Variables</th>
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*p < 0.05
**p < 0.002
***p < 0.0001

Table 5.30
Correlations Between Measures of Absence and Length of Service

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*p < 0.05
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### Table 5.30

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* *p < 0.05  
**p < 0.002  
***p < 0.0001
5.32 Gender Differences (Groups 2 and 3).

Hypotheses 1.5 and 1.6 predicted stronger correlations between unpaid absences and age-length of service in males than in females (Bernardin, 1977). Nicholson, Brown and Chadwick-Jones (1977) found that in males, a fairly distinct pattern of fewer but longer absences occurring as age increases. Correlational analysis for age and measures of absence indicate that in the male sample, age is inversely correlated with at least one measure of unpaid absence (AS; \( r = -0.30, p < 0.0001 \)) and the measure of Total Absence (\( r = -0.16, p < 0.05 \)). In the male sample, length of service appears to be also inversely correlated with unpaid sickness absence (AS; \( r = -0.28, p < 0.0002 \)).

In the female sample the correlation between age and unpaid absence was not significant. Age however was inversely correlated with unpaid absence (AS; \( r = -0.18, p < 0.05 \)).

In the female sample age showed a significant positive correlation with a measure of paid injury absence (BC; \( r = 0.19, p < 0.05 \)). In females, length of service was positively correlated with a measure of paid sickness (PS; \( r = 0.23, p < 0.01 \)). In females, age and length of service appear to show negative correlation with measures of unpaid absence but seem to be positively correlated with measures of paid absence.
5.33 **Company Affiliation** (Groups 4 and 5)

The results of this study suggest that age-length of service is inversely correlated with measures of unpaid absence in both groups of employees. This is logical as both management and classified are likely to receive more available paid time off as their length of service increases. In the management group, length of service was not significantly correlated with unpaid absence. In classified employees length of service was inversely correlated with unpaid absence (AS; \( -0.27, p < 0.0002 \)).
6.10 **Physical Fitness and Absenteeism**

The results of the present study provided only minimal support for the popular claim that physically fit employees show a reduction in sickness and injury absence over unfit employees (Donaghue, 1977). Caution however should be implemented when interpreting these results.

The analysis of Group 1 (combined male and female data) did support the premise that fitter employees have less absence, but the inverse correlations, however significant, are realistically very modest. Most inverse correlations between $\text{MVO}_2$ and sickness absence are supported by previous studies of physical fitness and absence (Linden, 1969; Cady, 1979).

These correlations all but dissappeared when the effects of gender were taken into consideration. The analysis of the male data did not produce any significant correlations. Only in the female group was an inverse correlation between $\text{MVO}_2$ and Paid Injury Absence, modestly significant.

These results were somewhat disappointing in light of popular claims and literature. As discussed earlier in Chapter 5, office workers, especially male white collar
workers are a very select population. Shephard (1981),
discounts the possibility that increases in
cardio-respiratory fitness can affect fatigue and the
ability to work through minor illnesses as being
significant in office workers. It is more probable that
these differences between fit and unfit employees should
show greater manifestations in the absence data of blue
collar populations requiring higher levels of energy
output.

The Steers & Rhodes (1978) concept of "ability to
attend" appears to be more relevant to occupations
requiring a high minimal fitness ability to attend, rather
than sedentary populations. This therefore is a major
fault of the present and past studies of physical fitness
and absence from work.

The Steers & Rhodes concept of "ability to attend"
also appears to be more of a "gatekeeping factor" rather
than a factor that actively shapes attendance or absence
behavior under normal circumstances. Employees having a
physical fitness level much greater than the "minimum
requirement" for attendance (whatever level that may be)
will not be any better attenders than the minimum fitness
employees. By the Steers & Rhodes model, only employees
with very reduced capabilities to attend should show
greater incidences of absenteeism. This interpretation
appears to contradict the notion that fitter employees are better attenders (Donoghue, 1977). In a normal white collar sedentary population, there should be no reason why fit employees are better attenders than the rest of their co-workers.

6.20 **Effects of Gender**

Hypotheses 1.3 and 1.4 suggested that some inverse correlation between MVO\(_2\) and absence would be present only in females. Some support for this observation can be found in the results of the Quasar Systems (1976) study of MVO\(_2\) and subsequent Ontario Health Insurance Plan medical costs. Of the 9 groups sampled, only the female age 50-65 year group showed significant inverse correlation between MVO\(_2\) and medical costs (\(r = -0.35, p< 0.05\)).

Again the problem here may be one of sensitivity. Males traditionally are absent about half as much as females (Education Research Services, 1982). Male office workers are absent about half as often as males engaged in manual labor occupations. It is entirely possible that the present sample of male office employees (mean absence 4.59 days annually) did not show enough absence for the difference in MVO\(_2\) to be meaningful. The female group (mean absence 7.84 days annually) because of their larger annual absences allowed for a more sensitive analysis. In
light of these results, future research may be more
fruitful if directed at "blue collar" or manual occupations
only. Traditionally, this has not been the case, as "white
collar" office samples have been more convenient to study.

The present study indicates that the absences of
males and females are the products of very different groups
within the employee population. Males are generally absent
much less and their absences are manifested differently
than females. It is likely that these differences in
absence behavior are not due as much to the fact that one
group is male and the other female, but rather to the
socioeconomic and cultural characteristics of each group.

If higher fitness levels are really beneficial in
improving attendance behavior in high absence populations,
would occupational fitness programs not be better directed
at female blue collar populations rather than the present
male white collar orientation?

Is low fitness a physiological problem (Steers &
Rhodes Ability to Attend) in blue collar female
populations, or are other factors more important in
determining absence behavior?

It is important that answers be found to these
questions in order to gain a more thorough understanding
into the role of occupational fitness programs.
6.30 **Age and Length of Service and Absence Behavior**

The results of this study support the hypotheses 1.5 and 1.6 which predicted a decrease in the incidence of unpaid absence as an employee becomes more senior, both in the cases of absolute seniority (age) and relative seniority (length of service). The literature seems to support the notion that length of service is probably a more important variable in determining unpaid absence behavior than age, since the two are highly intercorrelated (Bernardin, 1977; Aradwick-Jones, Nicholson and Brown, 1982). This does not however discount the effects of age. Older employees tend to show fewer absences, but the nature of the absences are usually longer, reflecting more serious health problems (Chadwick-Jones, Nicholson and Brown, 1982).

In addition to the earlier hypothesis that older and more senior employees have more access to paid absences and will therefore show a reduction in unpaid absences, a number of other factors could hypothetically affect these relationships.

Chadwick-Jones, Nicholson and Brown (1982) have suggested that unpaid absences are usually considered voluntary, controllable or uncertified. In management terms, these are unsanctioned absences. Young employees
may be more active in recreational activities and may welcome "stealing" a day or two to go skiing or to go to the beach. In older employees this tendency is probably not as strong. Younger males may be more inclined to exhibit this behavior than younger females for a host of cultural and socioeconomic reasons. Long service employees may also constitute a select group of individuals, possessing a higher degree of allegiance and loyalty to the company. Shorter term employees may not feel such a strong sense of loyalty and may be more inclined to show a greater frequency of unpaid absence behavior.

Conversely, this effect could work in reverse. Employees that show good attendance patterns are rewarded and eventually go on to become long term employees. Poor attenders are not given such incentives and eventually quit or are terminated. This produces a situation where the long term employees are the ones with the better attendance records to begin with (Martin, 1971). Data on the relationship between age and absence in female employees is often conflicting and ambiguous (ERS, 1980). Socioeconomic status, choice of occupation, family status and marital status all seem to be more important mediating variables in females than in males. This study did not find an inverse correlation between age and unpaid absence in females. This was unexpected in light of the significant inverse
correlation between length of service and unpaid absence in the female group.

In management terms, unpaid absences are often classified as voluntary or unsanctioned absences. In most labor contracts, "permission" or certification from a physician must be obtained before the employee is entitled to receive paid absence benefits, hence unpaid absences are often regarded as "unnecessary".

Females show less "unsanctioned" absence behavior for a number of reasons. Firstly, they are probably less able to afford to take the day off without pay than males. They probably receive a lower income and they may have greater family responsibilities, therefore their absence behavior is less "frivolous". Secondly from a sociocultural standpoint, if unsanctioned absences are a form of negative exchange against the employer, females are probably less likely to exhibit this kind of anti-establishment behavior (Chadwick-Jones, Nicholson and Brown, 1982)

6.40 Company Affiliation

Hypotheses 1.7 predicted that union or classified workers as a group would show greater absence than managers. The fact, in this sample, that the hypotheses should be supported comes as no great surprise. Managers and union workers are often separated by different sets of rules and
privileges. The former group is often given some discretion as to "taking days off" for illness, errands or personal business. The latter group is usually given no such discretion. As such, it is probably easier to get a "true" count of absences for classified employees than for managers.

The fact that union and management employees show different degrees of absence behavior keeping all other variables constant, should be enough reason to treat them as distinct samples of data when future research is contemplated.
PART II

DEGREE OF FITNESS ADHERENCE, MOTIVATION AND ABSENTEEISM
7.10 Introduction

The Steers & Rhodes (1978) process model identifies 'motivation to attend work' as a powerful factor in the absenteeism picture. It is logical to assume that given a person's ability to attend work, the next most important factor is motivation to attend.

Although the role of employee fitness programs in this process is still far from completely understood, research has suggested that employee fitness programs maybe influential in enhancing motivation.

Shephard's (1981) study of 1200 exercising employees of a large Canadian insurance company attempted to show experimentally that differences in absenteeism could be found between participants in the company exercise program. Even though shephard's study received some criticism in respect to methodological flaws (Fielding, 1982), it represented a significant step in the study of fitness program participation and absenteeism under experimental-like conditions, in a naturalistic setting.

Shephard found, using simple Chi square analysis that
high program adherents were absent significantly less frequently than low program adherents and controls. High adherents (attending two or more sessions per week) were on average, absent 2.5 days less per employee than non-participants. This represented a 22% advantage over the remainder of the test company and a 42% advantage over the same period when compared to pre-intervention data.

Analysis of variance using each subject as his own control, although revealing a similar trend, could no longer maintain statistical significance.

Similarly the Bjurstrom and Alexiou (1978) study reported that male and female participants in the employee fitness program showed a significant reduction in personal sick leave over the previous year when no program existed. As discussed in Chapter 3, this study provides little additional insight as no reference is made to differences, if any, between high and low adherents. Relative gains in fitness versus sick leave were not reported and no mention was made with respect to the organization's overall absence and sickness trends immediately before and after the year being tested. The Bjurstrom and Alexiou (1978) study does report an average absence reduction of approximately 3.3 days per employee over the previous year.

Several similar reports have appeared in the trade literature. Battelle Laboratories reported that physically
active employees were apt to be absent about 3 days less than less active employees. They go on to report that the employee fitness program is saving the company $150,000 per year through reduced absenteeism (McKendrick, 1982).

A recent report by the Dallas based Aerobics Institute also suggested that participation in employee fitness programs can reduce absenteeism. 7400 teachers in Dallas participated in this study. 50% were assigned to a fitness group and 50% were designated as non-participating controls. On the average, the teachers in the fitness group took 3 fewer sick days off per year, prompting officials to estimate a savings of $452,000 in substitute pay alone.
Although it is highly probable that participation in employee fitness programs does have a very real effect on workers' motivation to attend work, it is virtually impossible to draw any real conclusions at this time.

Problems inherent in the current research include:

1) Many of the reports are anecdotal in nature. Experimental studies are rare, true experimental studies are rarer still. (Folkins and Sime, 1981).

2) Methodological flaws abound. Rigorous statistical treatment of data is unusual. (Fielding, 1982).

3) Measurement vehicles are inadequate at this time, with respect to measuring absence (Steers and Rhodes, 1978) and with respect to measuring psychological components of motivation.

Ideally, these problems should be tackled prior to future research attempts. However, many of the concerns are intrinsic to the study of human behavior and these problems are compounded when applied to a naturalistic setting. It is this author's belief that valuable information can still be produced in spite of tremendous methodological barriers.
7.20 **Motivation and Absence Behavior**

The Steers & Rhodes (1978) model suggests that motivation to attend work is largely determined by the combination of

a) the employees affective responses to the job situation and

b) the various internal and external pressures to attend.

The prevalent belief is that if an employee enjoys the work environment and the tasks that characterize his or her job situation, then it can be expected that the employee will have a strong desire to attend work (Hackman & Lawler, 1971; Steers & Rhodes, 1978).

7.30 **Factors Affecting Satisfaction With Job Situation**

The Steers & Rhodes model identifies several factors as instrumental in the job satisfaction process. These include:

(a) job scope  
(b) job level

(c) role stress  
(d) work group size

(e) leader style  
(f) co-worker relations

It is not entirely clear where fitness programs would fit into the job satisfaction process but some evidence exists to suggest that participation in fitness activities can affect many of the above variables.
Workers appear to enjoy working in an enriched job environment (Nicholson, Wall & Lischeron; 1977) and in an environment which fosters a sense of achievement. Experimental interventions or field experiments which have improved or enriched the employee's job, have shown substantial decreases in absenteeism. (Beer & Huse, 1972; Copenhaver, 1973).

Although the degree of job satisfaction is likely task specific, (ie. enriching the overall 'work environment' may not be as satisfying to the worker as enriching his/her specific job) it may be fair to suggest that having an employee fitness program on company premises, can make the overall job experience more enjoyable. Exercise breaks for example, seem to reduce the incidence of errors and improve output (Folkins & Sime, 1981).

Durbeck et al (1972) in a longitudinal study involving NASA employees reported significant attitudinal changes toward 'the job' following participation in the company exercise program. Durbeck suggested that a relationship existed between participation in the program and variables such as perceived job performance and job attitude. "Participants reported that they could work harder mentally and physically, enjoyed their jobs more and found their normal work routine less boring." (Durbeck, 1972, p. 788).
Moreover, these reported positive results correlated well with program attendance records, with high program adherents reporting the greatest effects. Some attempt was made to assess the validity of the self report data through comparisons with actual records. It was found that participants who reported better stamina did improve MVO2 levels, that participants who reported weight loss had actually lost weight and that participants who reported better attendance were in fact, absent fewer times. The authors concluded that self report data is in fact, valid to some degree. The same opinions were voiced by Wright (1982) following a study of exercising employees at Xerox.

Hypothesis: 2.1 Employees participating in a company exercise program will report improved physical well being. This response may be related to degree of participation.

Hypothesis: 2.2 Employees participating in a company exercise program will report improved attendance and productivity. This response may be related to degree of participation.

7.32 Role Stress Job stress has been cited as a primary contributor to both voluntary and involuntary absence (Rosch, 1981). The evidence supporting the contention that stress and anxiety increase employee absenteeism has been constant in the literature. Early studies by Jackson (1944) and Brodman (1945) indicated that primary causes of absences
among workers were poor work habits, personal maladjustment, dissatisfaction and irresponsibility. Sinha (1963) showed that industrial workers with high levels of anxiety also had high rates of absence.

Similar results have been reported by Cummings & Manring (1977), and Bernardin (1977). The Bernardin study examined the case of white collar workers while most previous studies have only looked at blue collar employees. Douglas (1976) studying teachers, reported that much of the absence attributed to physical illness was due in fact to personal and environmental stress. Teachers scoring high on stress and anxiety profiles were also most likely to be "excessively" absent.

A possible mechanism behind the stress-absence relationship has been advanced by Holmes & Rahe (1967). Their Social Adjustment Scale purports to predict the likelihood of getting seriously ill depending on the number of stressful events that a person encounters. Sylwester (1979) use the Holmes & Rahe scale to successfully predict the degree of absence in Oregon school teachers.

The role of physical exercise in the moderation of stress and anxiety has also been the focus of much research. According to Dishman's (1983) extensive review of literature, the desirable alterations in health-related moods following vigorous physical exercise is one of the few consistent
findings in contemporary sport psychology. Geist et al (1979) showed that running could be used successfully to treat depression. Morgan (1979) found that anxiety was lower following vigorous physical exercise. Similarly mood states of middle aged males were improved following physical exercise (Folkins, Lynch & Gardner, 1972).

Participants in regular exercise programs generally report feelings of reduced stress and tension. This appears to be a motivating factor in continued exercise adherence (Heinzlemann & Bagley, 1970; Long, 1983).

Shephard's (1981) study revealed that participants in the company exercise program reported increased patience, relaxation and well-being.

Similar results have been reported by participants in other occupational fitness programs (Durbeck, 1972; Haskell & Blair, 1980).

Although speculation continues about the exact mechanisms behind the positive effects of physical activity, it appears that participation in an occupational fitness program can improve mood and control stress.

**Hypothesis:** 2.3 Participants in an occupational fitness program will generally report reduced stress and tension. This effect may be related to how often they participate.
suggests that satisfaction with co-worker relations will be an important determinant of overall job satisfaction and therefore be related to attendance motivation. The evidence supporting this proposition however, has been less than overwhelming. Steers & Rhodes (1978) identified only two out of eight studies which reported significant relationships between co-worker relations and absenteeism (Metzner & Mann, 1953; Nicholson, Wall & Lischerson, 1977).

They do conclude however, that co-worker relations have generally been found to be strongly associated with general job satisfaction (Vroom, 1964).

Participants of fitness programs generally report increases in sociability (Heinzlemann & Bagley, 1970).

Shephard's (1981) study reported that exercise participants felt that they had developed a better rapport with their supervisors and their co-workers.

Greenberg (1976) found that individuals assigned to fitness training did better on discrimination of interpersonal skills and on communication over a non-training control group.

The social aspects of employee fitness programs are the best liked part for many participants. Heinzelmann & Bagley (1970) reported that over one fourth of all respondents to their survey listed social aspects of the fitness activities among the best liked features. This feature seemed to
increase adherence to the program. The authors believe that persons exercising in groups, tend to enjoy the experience more and feel a sense of personal commitment to continue. It is quite possible that social contacts made during exercise class will continue back at the work station. The social aspect of exercise and fitness activities conceivably can enhance relations with fellow workers and thereby increase satisfaction with the job situation and subsequent attendance behavior.

**Hypothesis**: 2.4 Participants of employee fitness programs will report an enhancement of social interaction among co-workers. This effect may be related to how often they participate.

7.4 **Factors Affecting Internal and External Pressures to Attend** The second set of factors in the Steers and Rhodes motivation model deals with pressures to attend work. These pressures may occur in the form of internal and personal attitude pressures and external pressures fostered by group norms or economic and market conditions (Steers & Rhodes, 1978).

The Steers and Rhodes model identifies five major pressures relevant to the motivation issue:

a) economic and market conditions

b) incentive/reward system

c) work group norms
d) personal work ethic
e) organizational commitment

7.41 Incentive/Reward System

A primary factor that is capable of influencing attendance motivation is of course the nature of the incentive or reward system used by the employer. (Steers & Rhodes, 1978). These rewards, although usually occurring in the form of pay and other 'material' incentives need not exclusively be limited to these forms. It is conceivable that employees could view daily use of the employee fitness and recreational facilities as being an 'incentive' to attend work. This incentive value could be a compelling attendance motivator especially if the activities were considered enjoyable.

7.42 Personal Work Ethic

Steers & Rhodes identify personal work ethic as an influence on attendance motivation. They note that many people feel morally obliged to come to work and that there is a direct relationship between a strong work ethic and the propensity to attend work. (Feldman, 1974).

Although little direct evidence exists to link fitness participation with the enhancement of work ethic, 'character building' has traditionally been a proferred benefit of sports and fitness participation (Kroll, 1982). Although it is extremely difficult to measure 'work ethic', some
implications may be drawn from attitudes towards work and the work situation. Typical comments of fitness activity participants are that they have a greater capacity to work harder, both mentally and physically or that they have improved concentration and decision making abilities (Heinzlemann & Bagley, 1970). Folkins and Sime (1981) reported that workers participating in fitness programs generally report improvements in work attitude.

Somewhat related to personal work ethic may be the effect of fitness participation on self-image and self-concept. Extensive reviews by Layman (1974) and Sonstrom (1983) indicate that participation in fitness and exercise programs enhances self-image and self-esteem. Some of the agents behind this enhancement in self-esteem as identified by Sonstrom, include goal achievement and a sense of competence, mastery or control. These agents could possibly reinforce a personal work ethic.

**Hypothesis:**

2.5 Participants in an employee fitness program will report a more positive work attitude. This response may be related to how often they participate.

**Hypothesis:**

2.6 Participants in an employee fitness program will report positive changes in self-image. This response may be related to how often they participate.
CHAPTER EIGHT

METHOD

8.10 The Questionnaire

The questionnaire used in this study was designed to assess participation and attitudinal behavior of participants in a large occupational fitness program. Since existing attitudinal inventories such as Taylor, (1953), the Cornell Medical Inventory (Brodman, 1956) and Kenyon (1968) were deemed too be too time consuming for participants to fill out, a less time consuming assessment was developed for the purposes of this study.

8.11 Assessment of Degree of Participation

A primary aim of this study was to establish a profile of the degree of participation of members enrolled in an existing occupational fitness program. To accomplish this, it was necessary to construct a frequency score, indicating how often a member actually participated in the program's activities. Figure 8.0 indicates the method that was employed to assess degree of participation. The computer was programmed to "count" the number of visits a participant made to the centre and to note the time of day that these visits were made. The total number of visits per week was used to assess degree of participation of each subject.

In addition to frequency of participation, a second measure length of membership was also employed.
8.12 Assessment of Attitudinal Change

The second variable relevant to the purposes of this study was degree of a attitudinal change. Based on previous literature and the Steers and Rhodes (1978) Process Model, six hypotheses were generated in Chapter Seven to guide this study. The following variables were deemed relevant to measure:

a) general attitude towards job  
b) perceived improvement of health  
c) perceived rate change in absenteeism  
d) perceived rate change in productivity  
e) perceived reduction in stress and tension  
f) perceptions of weight loss  
g) improvement in perceived self-image  
h) enhanced social relationships (ie new friends)

Subjects were asked to rate the degree of change in themselves caused by the Employee Fitness Program. The choices ranged from a value of 1 for "no change" to a maximum value of 5 for "great change" (Figure 8.1).
Participation in the Employee Fitness Program has caused the following changes in myself:

Legend 1 = No change
2 = Little change
3 = Noticeable change
4 = Significant change
5 = Great Change

a) more positive work attitude 1 2 3 4 5
b) better health 1 2 3 4 5
c) lowered absenteeism 1 2 3 4 5
d) increased productivity 1 2 3 4 5
e) lowered stress and tension 1 2 3 4 5
f) weight loss 1 2 3 4 5
g) improved self-image 1 2 3 4 5
h) gained new friends 1 2 3 4 5
8.20 The Sample  The subjects for this questionnaire sample were full time employees of a large Canadian telecommunications utility, who were enrolled as paying members in the corporation's occupational fitness program. The subjects ranged in age from 20 to 60.

Approximately 39% of the sample were males (n=277), and 61% of the sample were females (n=435).

8.30 Administering the Questionnaire  The entire membership of the corporate occupational fitness program was sampled. 1076 questionnaires were mailed to the work locations of each subject. This represented approximately 50% of the entire employee population at the company's headquarters office.

Subjects were asked to fill out the questionnaire completely and to return it via the company's internal mail service. This procedure ensured that the subjects would face minimal "hassle" to return the questionnaires. Subjects were allowed approximately 10 working days to return the questionnaires. Of the 1076 questionnaires that were initially mailed out, 712 were returned within the required time period. Time and budget restrictions precluded a second mailing. As such, a response rate of 66% was calculated for this study.

Each questionnaire was manually coded into the computer. Optical scanning was not used as the researcher wanted to visually inspect the integrity of the responses.
Chapter Nine
Results

9.00 Degree of Participation

Approximately 78% of the respondents indicated that they participated in the employee fitness program at least once per week, with the largest group of participants (48%) indicating that they used the program 5 days per week.

Age and gender were not factors in determining how often a participant used the fitness program.

9.10 Physical Well Being

Hypothesis 2.1 predicted that participants in a company exercise program would report improved physical well being and that the degree of participation would be related to the reports of well being.

In this study, physical well being was assessed by variables (a) "improvement of health" and (b) "weight loss". The intercorrelation between these two variables was \( r = 0.60, p < 0.0001 \), higher than with any other given variable.

a) Improvement of Health

84% of all respondents indicated that they had noticed at least "noticeable change" as a result of participation in the fitness program. Approximately 32% reported noticeable change, 32% reported significant change and 20% reported great change. 12% reported little change and only 4% reported no change.

Degree of reported change in health was also related to
both adherence variables (1) length of membership and (2) degree of participation.

Table 9.10

<table>
<thead>
<tr>
<th>Perceptions</th>
<th>Length of Membership</th>
<th>Degree of Adherence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Improved Health</td>
<td>0.16*</td>
<td>0.21**</td>
</tr>
<tr>
<td>2. Weight Loss</td>
<td>ns</td>
<td>0.21**</td>
</tr>
<tr>
<td>3. Reduced Absenteeism</td>
<td>0.14*</td>
<td>0.18**</td>
</tr>
<tr>
<td>4. Increased Productivity</td>
<td>0.12*</td>
<td>0.16**</td>
</tr>
<tr>
<td>5. Reduced Stress</td>
<td>0.12*</td>
<td>0.19**</td>
</tr>
<tr>
<td>6. New Friends</td>
<td>0.17**</td>
<td>0.15*</td>
</tr>
<tr>
<td>7. Improved Work Attitude</td>
<td>0.14*</td>
<td>0.21**</td>
</tr>
<tr>
<td>8 Improved Self Image</td>
<td>ns</td>
<td>0.20**</td>
</tr>
</tbody>
</table>

* p < 0.001
** p < 0.0001

b) Weight Loss 52% of all respondents indicated some degree of weight loss as a result of participation in the fitness program. Approximately 32% reported noticeable change, 13% reported significant change and 7% reported great change. 30% reported little change and 18% reported no change. Degree of reported change was not related to (1) length of membership, but was significantly related to (2) degree of participation.
These results appear to be consistent with those of previous researchers measuring changes in perception of personal health as a result of participating in an employee fitness program (Heinzlemann & Bagley, 1970; Morris & Husman, 1978; Shephard, 1981; Pauley, 1982; Wright, 1982). The absence of a control group in this study makes it difficult to say if non-participants would have reported similar changes, but that possibility is doubtful. Heinzlemann & Bagley (1970) and Durbeck (1972) reported that non-participants reported no changes in self perceptions of better health or weight loss.

There is little argument that participation in occupational fitness programs has a beneficial effect both on perceived health level and actual physiological changes in the body (Cooper, 1976). The results of the present study suggests that even among participants, perceptions of health improvements is correlated to degree of participation. High adherents and long term adherents tend to report greater improvement is correlated to degree of participation. High adherents and long term adherents tend to report greater improvements in personal well being. The small magnitude of the correlations however suggests that there is probably an upper limit to this effect. Persons exercising ten times per week are probably not any more likely to report improvements to their health than persons exercising three times per week.
Hypothesis 2.2 Attendance and Productivity

Based on the bulk of physical fitness and absence literature, Hypothesis 2.2 predicted that participants in a company exercise program would report reduced absenteeism and improved productivity (Shephard, 1981).

In this study one variable was used to assess absenteeism and one variable was used to assess productivity. Intercorrelations between these two variables was $r = 0.72$, $p < 0.0001$.

a) Absenteeism 41% of all respondents indicated that they had recognized at least a "noticeable" decline in absentees, as a result of participation in the program. 16% reported noticeable change, 12% reported significant change and 13% reported great change. The largest group, 33% reported no change and 26% reported little change.

Degree of reported reductions in absenteeism was correlated to both adherence variables (1) length of membership and (2) degree of participation.

The results of this study indicate that although some participants reported reduced absences and increased productivity as a result of the fitness program, the majority of participants did not. There are several possible reasons why this should be so. The most probable reasons is that no change in de facto absence behavior occurred as a result of participation in the program. The results of Part I suggests
that white collar office workers have lower absences that corresponding blue collar employees. It is also likely that participants in the fitness program form an even more select group within this group of relatively low absence personnel (Fielding, 1982). As such, it would be unusual to expect this group to drastically lower an already low absence rate.

Participants of occupational fitness programs also tend to perceive differences in personal behavior more readily if these changes in behavior were original reasons for participation (Heinzlemann & Bagley, 1970). There is likely a high correlation between reasons why a person started an exercise program and the degree of improvement in that behavior. Few people report that they begin a fitness program to reduce absenteeism and increase productivity (Shephard, 1985).

Perceptions of change was also significantly correlated to length of membership within the program and to degree of participation, although the correlations are very modest. Participants who are highly active in the program do not report greatly increased perceptions of change over more moderate participants.

b) **Productivity**

56% of all respondents reported at least a "noticeable" improvement in productivity as a result of participating in the fitness program. 29% reported noticeable change, 19% reported significant change and 9% reported great change.
29% reported little change and 15% reported no change whatsoever.

Degree of improvements in productivity was correlated to both measures of adherence (1) length of membership and (2) degree of participation.

Hypothesis 2.3 Stress and Tension

Hypothesis 2.3 predicted that participants in a company fitness program would report reduced stress and tension and that the degree of change would be related to degree of participation in the program.

In this study stress was assessed by variable
a) lowering of stress and tension. This variable was intercorrelated highly with "improvement of health" $r = 0.61, p< 0.0001$.

a) Stress Reduction 82% of all respondents indicated at least a noticeable reduction in stress and tension as a result of participation in the fitness program. Approximately 30% reported significant change and 22% reported great change. 12% reported little change and only 6% reported no change.

Degree of reported reduction in stress and tension was also related to both measurers of adherence (1) length of membership and (2) degree of participation.

Stress reduction was next in popularity only to "better health" as a reported effect of participation in the program. The fact that only 18% of participants indicated
little or no change, came as little surprise. The preponderance of literature attest to the beneficial value of exercise as a stress reduction vehicle (Pauley, 1982; Seamonds, 1982; Long, 1983).

These results indicate that the participants of this occupational fitness program also feel that exercise has been effective in reducing stress for them.

Degree of stress reduction was only modestly related to measures of adherence. These results would indicate that at least within this sample of white collar employees, degree of perceived stress reduction is not highly correlated with degree of adherence. Casual participation in the program is all that is necessary to evoke feelings of reduced stress. This seems to support the viewpoint that high physiological fitness is not as important in determining reductions in stress as the psychosocial effects of merely participating within one's own limits (Long, 1983).

**Hypothesis 2.4 Social Interaction**

Hypothesis 2.4 predicted that participants in a company fitness program would report enhanced social interaction in the way of new friends. (Heinzlemann & Bagley, 1970). The degree of social interaction would also be related to adherence and degree of participation in the program.

In this study, social interactions was assessed by variable (a) new friends. This variable was not highly
intercorrelated with any of the others (highest $r = 0.40$, $p < 0.0001$) indicating that it probably measured an independent construct.

(a) **New Friends** 49% of all respondents indicated that they had developed new friendships through the course of participating in the fitness program. Approximately 28% reported noticeable change, 15% reported significant change and 7% reported great change. 31% reported only little change and 20% reported no change.

Degree of reported change in new friendships was also significantly correlated to both measures of adherence (1) length of membership and (2) degree of participation.

**Hypothesis 2.5 Work Attitude** Hypothesis 2.5 predicted that participants in a company fitness program would report an improvement in job attitude and that this degree in improvement would be related to degree of participation and adherence.

In this study, job attitude was assessed by variable (a) more positive work attitude. Positive work attitude was highly correlated with improvements in productivity $r = 0.71, p < 0.0001$.

(a) **Improvement in Work Attitude** Approximately 65% of the respondents reported at least a noticeable improvement in work attitude as a result of participating in the fitness program. 35% reported noticeable improvement, 21% reported
significant improvement and 9% reported great improvement. 22% reported little change and 13% reported no change at all.

Degree of improvement in work attitude was related to both adherence variables (1) length of membership and (2) degree of participation.

The results of this study support the work of previous researchers that find perceptions of improved work attitude as a product of participation in an occupational fitness program (Durbeck, 1972; Wright, 1982). Only a minority of the sample (30%) reported a significant or great improvement in work attitude. Again this is not surprising, as improvement in work attitude is not common reason that participants give for participating in an occupational fitness program. One would expect that because of this, changes in work attitude, changes in absenteeism and productivity would not be reported as often as changes in personal well being.

Perceptions of improvements in work attitude were positively correlated to both length of membership and degree of adherence. Both correlations were highly significant but the magnitude of the correlations was very modest. This suggests that persons exercising very regularly will probably report no greater changes in work attitude than casual exercisers. Again this implies that the positive effects probably more psychosocial and that a threshold effect may be
Persons exercising only once or twice per week are likely to experience a positive change in work attitude.

Hypothesis 2.6  Self-Image

Hypothesis 2.6 predicted an improvement in self-image among participants of a company fitness program and that the degree of change would be related to degree of participation and adherence.

In this study, self-image was assessed by variable (a) improved self-image. Self-image was most significantly correlated with "improvements of health", \( r = 0.60, \ p< 0.0001. \)

a) Improvement in Self-Image

Approximately 76% of all respondents reported at least a noticeable improvement in self-image as a result of participating in the fitness program. 36% reported a noticeable change, 26% reported a significant change and 14% reported great change. 17% reported little improvement and 7% reported no change whatsoever.

Degree of improvement of self-image was not related to (1) length of membership, but was related to (2) degree of participation.
Chapter Ten

10.10 Discussion

The Steers & Rhodes (1978) Process Model suggests that motivation to attend work is a most important factor when one is attempting to describe both involuntary and voluntary absence behavior.

The purpose of this study was to explore the role that occupational fitness programs could play in mediating this motivation factor. The Steers & Rhodes Model allowed the formulation of six hypotheses which were subsequently tested with data from an existing employee fitness program.

Physical Well Being

There was little question that the majority of respondents to the questionnaire perceived an improvement in their health. This fact could conceivably affect attendance by both enhancing ability to attend and enhancing motivation to attend.

Persons enrolled in the program for a longer period of time were more likely to report improvements in health. This correlation was significant, but very small. It is possible that new recruits notice improvement in their health at the beginning stages of the program, but after the first year or two, the magnitude of these changes becomes more difficult to detect. Improvements to health may level off very quickly.

Likewise, degree of participation also was significantly related to reports of improved health ($r = 0.21$, $p < 0.0001$).
This correlation is also modest, suggesting that perhaps only a minimal threshold level of participation is necessary to produce perceptions of better health. It is also likely that there is an "optimal" frequency of participation in terms of better health.

Weight loss was reported by a majority of the participants and this was also correlated modestly to degree of participation $r = 0.20$, $p < 0.0001$.

10.20 Attendance and Productivity

The central issue in both essays concerned the relationship between occupational fitness and absenteeism. Since the literature had suggested that participation in employee fitness programs is associated with reduced absenteeism, hypothesis 2.2 predicted that participants would report the same. Moreover, shephard's (1981) study showed that reductions in absenteeism may be greater in high adherents.

This study revealed that although a large percentage (41%) of the participants indicated some reduction in absenteeism, only 12% reported significant change and only 13% reported great change. The pattern was similar for productivity although greater numbers reported significant change.

As alluded to in Chapter Six, changes in absenteeism and productivity within "white collar" populations may be more difficult to measure than in traditional "blue collar"
occupations. Participants of occupational fitness programs may be already a select group of "good attenders". Changes within such a group may be more difficult to measure. Future studies may be better directed at blue collar populations or groups of high absentee employees.

Hypothesis 2.2 postulated that reports of absence reduction and productivity improvement would be related to degree of participation and adherence.

Long term adherents did report reduced absence and increased productivity but the degree of correlation to adherence was very modest $r = 0.12$ and $r = 0.14$, $p< 0.001$.

Again as in the case of physical well being, a threshold effect may be operating. Perceptions in attendance and productivity may be related to the first few months or years of joining the program, but this soon levels off. Song (1982) in a review of Shephard's (1981) data noted that "persistent high adherents" showed a progressive trend of improved attendance through the first year of participation, with an upswing after the first year.

Fielding (1982) has suggested that participants in fitness programs are probably better attenders as a self selected group. This study suggests that even among this "select group", a positive correlation exists between perceptions of absence improvement and productivity improvement and de facto degree of participation.
10.30 Stress

The Steers & Rhodes Model identifies stress as a primary contributor to absenteeism. Although the exact mechanism behind this contribution has not been elucidated in their model, (Steers & Rhodes, 1978), stress may affect motivation to attend work by (1) reducing desire to come to work, reducing satisfaction with the job situation and by (2) increasing the likelihood of physiological illness (Holmes & Rahe, 1967).

This study hypothesized that participants in occupational fitness programs would report reductions in stress and that the degree of reduction would be related to degree of participation. A very high number of the respondents reported at least a noticeable reduction in stress (82%) with 52% of the respondents reporting significant or great change. This was higher than for any other single category in terms of significant or great change.

Degree of participation and adherence did seem to be significantly correlated with reports of stress reduction, but the correlations were very modest in size. This may suggest that even casual participation in the occupational fitness program can significantly reduce perceptions of stress and anxiety. Long (1983) for one, suggests that the psychosocial aspect of the fitness program may be as important as the actual exercises themselves. These findings are congruent with that viewpoint.
10.40 **Social Interaction**

The Steers & Rhodes (1978) Model identifies "co-worker relations" as possibly being influential in enhancing or detracting from an employee's satisfaction with their work situation. The present study hypothesized that participants in occupational fitness programs would report an increase in the number of "new friends" and that this could be related to degree of participation or adherence. Although 49% of respondents reported at least a noticeable change in the number of new friends, only a minority (22%) reported significant or great change.

This appears to be significantly related to length of membership in the program and degree of participation, although the size of the correlations is modest. Enhanced social interaction may be significant perception for some participants, but not for all.

10.50 **Work Attitude**

Steers & Rhodes identify a strong personal work ethic as being a powerful influence to come to work. This study postulated that participation in the occupational fitness program could affect personal work attitudes.

65% of the respondents in this study reported at least a noticeable improvement in work attitude as a result of the fitness program. At least 30% of the sample reported significant to great change, indicating that at least for
some employees, participation in the fitness program could be very beneficial for individual attitudes towards the job. The degree of improvement appears to show some positive correlation with length of membership and degree of participation, although the magnitude of the correlations are modest.

10.60 Self Image

A majority of the respondents in this sample reported at least a noticeable improvement in their self image as a result of participating in the program (76%), with a sizeable percentage (40%) indicating significant or great change. This would support the work of Layman (1974) and Sonstrom (1983), both of whom found evidence that fitness participation enhances self image and self esteem.

In this study, degree of change was not related to length of membership but was significantly related with degree of participation. Longer term members did not report greater increases in self image but high participants did, although the magnitude of the correlation is small.
CHAPTER ELEVEN

Conclusions and Implications for Future Research

11.0

Limitations of this Study

The measurement of human behavior in a naturalistic setting is inevitably fraught with methodological pitfalls. Even the best conceived "empirical" studies have met with criticism on these grounds alone (Shephard 1981, Fielding, 1982). The present study focused on the possible relationship between occupational fitness and two aspects of absence behavior as directed by the theoretical model of Steers & Rhodes (1978). This study was not designed to be an experimental study but rather to be one of exploration, to point to possible relationships between variables as viewed from a different conceptual lens. In light of the paucity of theory and research in the field of fitness and absenteeism, exploratory research provides clues as to possible avenues for future, directed research.

Part I attempted to describe any relationship between a measure of physiological fitness (MVO2) and multiple measures of sickness absence. Conclusions are difficult as this was a correlational analysis of data and not an experimental one. However, the small magnitude of the
correlations although highly significant in some cases, indicates that a direct relationship between high physical fitness and low absence is probably non-existent at least in white collar, sedentary populations. This is not to say that more powerful relationships may exist within either high absence populations or populations engaged in tasks requiring higher levels of fitness.

The differences in absence rates between males and females, classified and management and old and new employees points to the difficulty in interpreting data from non-homogeneous data groups. In the future, researchers would be advised to consider such variables when designing experimental plans.

This has not been the case in the past.

An interesting result of the study in Part I provides support for the "gate keeping" function of physical fitness in the Steers & Rhodes notion of ability to attend. Employees with very low fitness or very poor health may indeed be sick and absent more often, but it may be unreasonable to expect very fit or very unhealthy employees to be away any less often than the average. "Very healthy employees may not necessarily attend work because other factors may have a greater effect on the attendance decision" (Steers & Rhodes, 1978, p.p. 401-402).
Part II approached the fitness and absence relationship from the second part of the Steers & Rhodes Model, motivation to attend. The hypotheses developed in this section of the study predicted changes in perception among a number of personal attitude and health variables (Shephard, 1985). The Steers & Rhodes conceptual framework predicted that enhancement of these attitudes could affect motivation to attend work. This mechanism has been suggested by Shephard (1981) as possibly being influential in explaining differences in absence behavior between "high adherers" to the fitness program and other groups within the company. The questionnaire employed in this study was very simplistic and cannot be used as a guide to accurately judge attitudinal change. Many of the attitude variables used in this questionnaire were intercorrelated with each other, indicating, that although some positive correlation did exist between adherence behavior and attitude change, it was impossible to say with any degree of certainty what changed and by what amount.

Again it must be stated that Part II was also exploratory. The literature has not provided overwhelming information as to the possible relationships between fitness participation and attitudinal variables. Likewise, few studies have examined degree of participation within self selected exercise groups and its relationship with perceptions of
change.

The results of Part II suggest that active participation even at the moderate level can elicit significant changes in personal perceptions about self, job, health and friends. One or all of these variables have been identified as being important in the Steers & Rhodes Model of motivation to attend work.

Future studies may want to use more conventional questionnaire inventories and attempt to relate these results to the de facto events as they occur in nature. A further step would be to replicate these results using a number of different occupational populations. Certainly the results in Part I indicate that differences between occupational populations are likely.

Future studies may also want to use other measures of fitness as an adjunct to MVO₂. Measures such as flexibility and strength may be particularly relevant to occupational populations and the incidence of absence.
REFERENCES


Arlington, Virginia


Herman, J.B. (1973) Are Situational Contingencies Limiting Job Attitude Performance Relationships? Organizational Behavior and Human Performance 10: 208-224


# Appendix A

## Summary of Major Studies on Physical Activity and Heart Disease

### Ratio of Incidence of Coronary Disease

<table>
<thead>
<tr>
<th>Author</th>
<th>Categories Studied</th>
<th>Coronary Diseases</th>
<th>Infarction</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morris, 1953</td>
<td>31,000 urban transport employees. Active conductors/sedentary drivers, 35-64 years</td>
<td>0.70</td>
<td>0.53</td>
<td>0.48</td>
</tr>
<tr>
<td>London</td>
<td>180,000 man-years. Postal workers. Active delivery staff/sedentary employees.</td>
<td>0.75</td>
<td>0.50</td>
<td></td>
</tr>
<tr>
<td>Brown, 1957</td>
<td>1,062 men aged between 50 and 60, including 89 coronary sufferers. 158 very active</td>
<td>0.29</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td></td>
<td>occupations/137 sedentary occupations. 766 fairly active/137 sedentary occupations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chapman, 1957</td>
<td>772 civil service employees 40-59 years. 492 active/236 sedentary (differences not</td>
<td>1.03</td>
<td>0.98</td>
<td></td>
</tr>
<tr>
<td>Los Angeles</td>
<td>significant)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zukel, 1959</td>
<td>1,886 controls and 288 cases of coronary diseases. Over 35 years of age. Farmers/</td>
<td>0.70</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td>N. Dakota</td>
<td>other occupations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stamler, 1954-57</td>
<td>740 public service employees. 50-59 years. Blue collar/white collar</td>
<td>0.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>McDonough, 1964</td>
<td>3,102 agriculture workers. 15-74 years. Considerable/inconsiderable degree of</td>
<td>0.17</td>
<td>0.50</td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>physical activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rose, 1969</td>
<td>9,777 civil servants. 40-64 years. Ratio of incidence of ECG lesions. 3,561 walkers/</td>
<td>0.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>London</td>
<td>436 nonwalkers</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(*From Quasar, 1976)
### APPENDIX B

**Summary of Major Studies of Physical Activity and Absence From Work**

<table>
<thead>
<tr>
<th>Author</th>
<th>Population</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shepherd; 1981</td>
<td>white collar, Canadian Insurance employees (n=1200)</td>
<td>Negative association with adherence</td>
</tr>
<tr>
<td>Bjurstrom and Alexiou, 1978</td>
<td>white collar, educational employees, New York State (n=847)</td>
<td>participants in program less absent</td>
</tr>
<tr>
<td>Cady et al, 1979</td>
<td>firefighters</td>
<td>negative association with level of fitness</td>
</tr>
<tr>
<td>Pravosvdov, 1976;1978</td>
<td>white and blue collars</td>
<td>negative association with level of fitness</td>
</tr>
<tr>
<td>McKendrick, 1982</td>
<td>white collar</td>
<td>physical active workers less absent</td>
</tr>
<tr>
<td>Linden, 1969</td>
<td>customs officer (n=51)</td>
<td>negative association with MVO2</td>
</tr>
<tr>
<td>Keelor, 1976</td>
<td>blue collar, Sweden</td>
<td>participants less absent</td>
</tr>
</tbody>
</table>
## APPENDIX C

Absence and Job Satisfaction Research, Categorized by Methodology

<table>
<thead>
<tr>
<th>Source</th>
<th>Sample</th>
<th>Relationship Found</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category 1: Individual Correlation Studies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noland (1945)</td>
<td>466 blue-collar males</td>
<td>negative</td>
</tr>
<tr>
<td>Van Zelst and Kerr</td>
<td>340 blue-collar males</td>
<td>negative</td>
</tr>
<tr>
<td>Talachi (1960)</td>
<td>42 blue-collar males</td>
<td>negative</td>
</tr>
<tr>
<td>Patchen (1960)</td>
<td>487 male process operators</td>
<td>negative</td>
</tr>
<tr>
<td>Harding and Bottenberg (1961)</td>
<td>376 airmen</td>
<td>zero</td>
</tr>
<tr>
<td>Vroom (1962)</td>
<td>489 male process operators</td>
<td>zero</td>
</tr>
<tr>
<td>Gadourek (1965)</td>
<td>2,227 blue-collar</td>
<td>zero</td>
</tr>
<tr>
<td>Gerstenfeld (1969)</td>
<td>148 blue-collar females</td>
<td>zero</td>
</tr>
<tr>
<td>Smith, Kendall, and Hulin (1969)</td>
<td>98 blue-collar males</td>
<td>negative (4 scales) and zero (1 scale)</td>
</tr>
<tr>
<td>Hackman and Lawler (1971)</td>
<td>208 blue-collar males</td>
<td>zero</td>
</tr>
<tr>
<td>Waters and Roach (1971)</td>
<td>160 white-collar females</td>
<td>negative (2 scales) and zero (3 scales)</td>
</tr>
<tr>
<td>Waters and Roach (1973)</td>
<td>197 white-collar females</td>
<td>negative (1 scale) and zero (4 scales)</td>
</tr>
<tr>
<td>Newman (1974)</td>
<td>108 male and female nursing staff</td>
<td>zero</td>
</tr>
<tr>
<td>Clark (1975)</td>
<td>62 female student nurses</td>
<td>zero</td>
</tr>
<tr>
<td>Nicholson, Wall, and Lischeron (1977)</td>
<td>95 blue-collar males</td>
<td>negative (3 scales) and zero (3 scales)</td>
</tr>
<tr>
<td><strong>Category 2: Criterion or Contrasted Group Studies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kornhauser and Sharp (1932)</td>
<td>200 blue-collar females</td>
<td>negative</td>
</tr>
<tr>
<td>Fraser (1947)</td>
<td>3,000 blue-collar males and females</td>
<td>negative</td>
</tr>
<tr>
<td>Katz and Hyman (1947)</td>
<td>1,800 blue-collar males</td>
<td>negative</td>
</tr>
<tr>
<td>Metzner and Mann (1953)</td>
<td>251 blue-collar males</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>163 white-collar males</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>212 white-collar females</td>
<td>zero</td>
</tr>
<tr>
<td>White (1960)</td>
<td>50 blue-collar males and females</td>
<td>negative (2 scales) and zero (4 scales)</td>
</tr>
<tr>
<td>Taylor (1968)</td>
<td>194 male process operators</td>
<td>negative</td>
</tr>
<tr>
<td>Ferguson (1972)</td>
<td>109 blue-collar males</td>
<td>negative</td>
</tr>
<tr>
<td>OPCS (1973)</td>
<td>7,998 males (all occupations)</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>5072 females (all occupations)</td>
<td>negative</td>
</tr>
<tr>
<td><strong>Category 3: Group Correlational Studies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kerr, Koppelmeir, and Sullivan (1951)</td>
<td>19 factory departments</td>
<td>negative</td>
</tr>
<tr>
<td>Mann and Baumgarten (1952)</td>
<td>163 white-collar males</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>251 blue-collar males</td>
<td>negative</td>
</tr>
<tr>
<td>Lundquist (1959)</td>
<td>9 factory departments</td>
<td>negative</td>
</tr>
<tr>
<td>As (1962)</td>
<td>18 factory work groups</td>
<td>zero</td>
</tr>
<tr>
<td>Mann, Indik, and Vroom (1963)</td>
<td>24 factory work groups</td>
<td>negative</td>
</tr>
</tbody>
</table>

*From (Chadwick, Nicholson & Brown, 1982)
# APPENDIX D

## Summary of Studies on Absence and Sex

<table>
<thead>
<tr>
<th>Author</th>
<th>Population</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marlin 1976</td>
<td>Teachers</td>
<td>Female &gt; male</td>
</tr>
<tr>
<td>Redmond 1978</td>
<td>Teachers</td>
<td>Female &gt; male</td>
</tr>
<tr>
<td>Sylwester 1979</td>
<td>Teachers</td>
<td>Female &gt; male</td>
</tr>
<tr>
<td>Garrison &amp; Muchinsky 1977</td>
<td>White collar</td>
<td>Female &gt; male</td>
</tr>
<tr>
<td>Johns 1978</td>
<td></td>
<td>Female &gt; male</td>
</tr>
</tbody>
</table>
APPENDIX E

MEMBERSHIP QUESTIONNAIRE
EMPLOYEE FITNESS PROGRAM

Part 1

1. a) Are you a regular user of the Employee Fitness Centre?

YES ___  NO ___

b) IF YOU NO LONGER USE THE EMPLOYEE FITNESS CENTRE
* DO NOT CONTINUE - GO DIRECTLY TO PAGE 6 *

2. Facility use:

a) Please indicate the number of times per week you use the facility on the following days and times:


<table>
<thead>
<tr>
<th>Time</th>
<th>6:00 - 8:00 am</th>
<th>11:00 - 1:30 pm</th>
<th>3:30 - 6:00 pm</th>
<th>6:00 - 8:00 pm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Times used</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
</tbody>
</table>

b) If you use the Fitness Centre less than once a week, how many times a month do you use the facilities?

(must be less than 4)

___

3. Length of time you have been a member of the FITNESS PROGRAM:

less than one year ___
1 - 2 years ___
3 - 4 years ___
4 or more years ___

4. Facilities or programs I use regularly are:
(check as many as apply)

weight training equipment ___
aerobics classes ___
exercise bikes ___
nutritional counselling ___
all available services ___
FOR QUESTIONS 5 & 6 USE THE FOLLOWING RATING SCALE:

1 = POOR  
2 = BELOW AVERAGE  
3 = AVERAGE  
4 = ABOVE AVERAGE  
5 = EXCELLENT

5 Compared to similar facilities you have visited, how would you rate the EMPLOYEE FITNESS CENTRE in the following areas?

<table>
<thead>
<tr>
<th>Service</th>
<th>Hours of Operation</th>
<th>Cleanliness</th>
<th>Personalized programs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Please rate our staff in the following areas:

<table>
<thead>
<tr>
<th>Availability</th>
<th>Competence</th>
<th>Courtesy</th>
<th>Friendliness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Please add any comments concerning our staff and service that may help us serve you better.

________________________________________________________________________
________________________________________________________________________

8. Number of times per week you use facilities OUTSIDE of the Fitness Centre:

<table>
<thead>
<tr>
<th>Frequency</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 or more times per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 times per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 times per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 time per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do not regularly use other facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9. If you use other facilities, what activities do you pursue?

- Nautilus training
- Free weight training
- Aerobics classes
- Nutritional counselling
- Other activities such as swimming, racquetball etc.

10. What equipment would you like to see the Employee Fitness Program purchase?

- Nautilus equipment
- Free weights
- Sauna, steam room or spa
- Suntan studio
- Other

FOR QUESTIONS 11 & 12:

CHECK AS MANY AS APPLY, INDICATING THE DEGREE OF IMPORTANCE YOU FEEL SHOULD BE ASSIGNED TO IT, USING THE FOLLOWING SCALE:

1 = NOT VERY IMPORTANT
2 = SHOULD BE CONSIDERED
3 = SHOULD BE IMPLEMENTED
4 = VERY IMPORTANT
5 = ESSENTIAL

11. I would like to see additional emphasis in such areas as:

<table>
<thead>
<tr>
<th>Area</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive testing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nutrition analysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personalized consultation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Athletics/recreation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. Should additional funding become available, these funds should be used for: (check ALL below)

<table>
<thead>
<tr>
<th>Area</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>More programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expansion of facility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase hours available</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There should be no increase in spending</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
13. Participation in the EMPLOYEE FITNESS PROGRAM has caused the following changes in me:

LEGEND
1 = NO CHANGE
2 = LITTLE CHANGE
3 = NOTICEABLE CHANGE
4 = SIGNIFICANT CHANGE
5 = GREAT CHANGE

1 2 3 4 5

a) More positive work attitude
b) Better health
c) Lowered absenteeism
d) Increased productivity
e) Lowered stress and tension
f) Weight loss
g) Improved self-image
h) Gained new friends

14. YOUR INPUT
a) What do you like BEST about the Employee Fitness Program?
__________________________________________________________

b) What do you like LEAST about the Employee Fitness Program?
__________________________________________________________

c) How would you improve on the quality of service available?
__________________________________________________________

d) Please list any unsafe or inconvenient conditions within the facility:
__________________________________________________________
15. PERSONAL DATA

a) sex:  
   male ___  female ___

b) age:  
   18 - 24 ___  
   24 - 34 ___  
   35 - 44 ___  
   45 - 54 ___  
   55 + ___

c) Where do you usually work?
   HQ Building ___  
   Boundary Plaza ___  
   ST & B ___  
   William Farrell ___  
   Please state ___

d) Department and floor  ________________

e) My occupation is primarily:
   Managerial ___  
   Professional ___  
   Technical ___  
   Clerical ___  
   Other ___  
   (please state) ________________________

f) Years with the company  
   ___ less than 1 year  
   ___ 3 years or less  
   ___ 5 years or less  
   ___ 10 years or less  
   ___ more than 10 years
PART II TO BE COMPLETED ONLY IF YOU NO LONGER USE THE EMPLOYEE FITNESS CENTRE

1. a) Are you a member/user of another fitness centre?
   yes ___  no ___

   b) IF YES, what type of equipment do you use?
      Check as many as are applicable
      
      Nautilus or similar ___
      Free weights ___
      Exercise bikes ___
      Tanning studios ___
      Sauna, steam room or hot tub ___

   c) IF YES, what type of programs do you participate in?
      Check as many as are applicable
      
      Nutrition ___
      Aerobics or dancersize ___
      Weight training ___
      Clubs - jogging ___
      Personal consultation ___

2. In order to improve service, the EMPLOYEE FITNESS PROGRAM must place more emphasis in the following areas:
   
   Increase programs offered ___
   Expand existing facilities ___
   Expand hours of operation ___
   Purchase new equipment ___
   Improve training of staff and volunteers ___

3. I last used the EMPLOYEE FITNESS CENTRE:
   
   More than one month ago ___
   More than two months ago ___
   More than four months ago ___
   More than six months ago ___
   More than twelve months ago ___

4. I no longer use the EMPLOYEE FITNESS CENTRE for the following reasons:
   
   Unsatisfactory service ___
   Inadequate facilities - too crowded ___
   Inappropriate programs for me ___
   Medical reasons or injury ___
   Other ____________________________ ___
PART II (cont'd)

5. PERSONAL DATA

a) sex:  
   male ___  female ___

b) age:  
   18 - 24 ___  
   24 - 34 ___  
   35 - 44 ___  
   45 - 54 ___  
   55 + ___

c) Where do you usually work?
   HQ Building ___  
   Boundary Plaza ___  
   ST & B ___  
   William Farrell ___  
   Please state ___

d) Department and floor
   ____________________________________________

e) My occupation is primarily:
   Managerial ___  
   Professional ___  
   Technical ___  
   Clerical ___  
   Other ___  
   (please state) ___

f) Years with the company
   ___  less than 1 year
   ___  3 years or less
   ___  5 years or less
   ___  10 years or less
   ___  more than 10 years
The employee fitness program described in this study is an example of a multidimensional approach to worksite fitness. Participants in the program had access to a number of different individual and group exercise activities. These activities included group aerobics (40-45 classes per week), running, strength training, intramural athletics, recreational programs, individual counselling and comprehensive physical fitness evaluations. These activities were conducted on company premises and lead by paid specialists and company volunteers. All activities were offered on "non-company time". Participation was voluntary, but supported by the corporation's management. The program described in this study has been in existence since 1977 and at last report (1985) had approximately 45% of the employees of the corporate headquarters as active participants.