Development and Evaluation of a Worksite Health Promotion

Program: Application of Critical Self-Directed

Learning for Exercise Behaviour Change

By

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ABSTRACT

Low participation in and poor adherence to regular exercise presents a major challenge for health promotion programs (Centers for Disease Control, 1990; Dishman, 1994). The workplace provides a unique context to reach a large proportion of society for multiple health promotion programs. Effective workplace interventions are likely those combining environmental and behavioural change models from a variety of fields, and are tailored as much as resources will allow to the needs and circumstances of the workplace culture and to individuals participating in the program (Green and Cargo 1994). Few studies in the workplace context, however, have focused on integrated programs drawn from a variety of fields to facilitate exercise behaviour change. Even less evidence exists about application of learning following worksite health promotion programs. The purpose of this study was to examine application of learning following an integrated worksite health promotion program. The aim of the program was to empower participants individually and collectively with knowledge, attitudes, skills and experiences to think critically and to self-direct exercise behaviour change. Green and Kreuter's (1991) Precede-Proceed model was used as the guiding framework for the planning and evaluation processes in a worksite setting.

Twenty-six clerical employees in the University of British Columbia's Department of Housing and Conferences participated in a four-week intervention program and twenty-two clerical employees participated in a waiting-list control group. An

eclectic set of quantitative and qualitative tools examined participant experiences and outcome measures pertaining to exercise behaviour change. Structural changes occurred in the workplace environment to facilitate healthful behaviours. Quantitative findings indicated that positive changes occurred for the experimental group during the program and at a three-month follow-up with respect to exercise self-efficacy, exercise stages of change and exercise behaviour ($p<0.05$). Qualitative analysis revealed that a myriad of individual, social and other contextual factors shaped whether and how learning was applied. Motives to attend the program, previous experiences, critical thinking and self-directed learning skills, and power to influence significant others and resources in the context of application influenced exercise behaviour. Furthermore, application varied by type, frequency, intensity and duration to suit specific needs and circumstances. Learning was applied to enhance motivation for brisk walking, fitness classes, holistic health behaviours and time with significant others.

Two conclusions are drawn from this study. First, a worksite health promotion program developed by integrating behaviour change models drawn from a variety of fields can be effective for exercise behaviour change. Second, in the context of application individual and social contextual strategies are required to enhance exercise behaviour. Theoretical concepts and intervention strategies to facilitate critical self-directed learning for exercise behaviour change are discussed.

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DEDICATION

I dedicate this dissertation to two special sisters, Alma and Josie, and two special brothers, Harvey and Thomas. Mothers and sons, connecting one generation to another.

CHAPTER 1

INTRODUCTION

Dramatic changes in lifestyles which have had profound effects on the status of people's health have taken place over the last century. Notably, one of those changes has been the significant reduction in daily energy expenditure in the home and in the workplace, resulting from labour-saving technologies and mechanised transportation. Further, the increasing popularity of convenient, consumer-based entertainment technologies in the home, such as television, video, stereo and computers have also had a significant impact on sedentary behaviour in leisure time. Green and Ottoson (1994) noted that "in 1850 human muscles supplied nearly one third of the energy used by workshops, factories and farms. Today the comparable estimate is less than one percent" (p.282). Reduced physical activity has contributed to the increase in hypokinetic diseases and premature death due to cardiovascular disease, colon cancer in males, low back pain, anxiety, depression, and low bone density in post-menopausal women (Bouchard, Shephard, Stephens, Sutton, & McPherson, 1990). These diseases are characteristic of contemporary industrial societies. Studies have suggested that both physical fitness and habitual physical activity are inversely related to coronary heart disease risk in adults (Blair et al., 1993; Morris, Everett & Semmence, 1987; Powell, Thompson, Caspersen, & Kendrick, 1987), although the magnitude of each remains to be determined.

Both physiological (Bouchard et al., 1990) and psychosocial benefits of regular exercise (Biddle, 1995) have been recorded extensively. Furthermore, Shephard (1989, 1992) identified specific benefits to be gained from a fit and healthy workforce. In order to attain the <u>physiological</u> benefits of exercise, however, the American College of Sports Medicine (ACSM) (1990) guidelines recommended that aerobic exercise should be performed at an exercise intensity of 60-90% of maximum heart rate and at a frequency of 3-5 times each week, for a duration of 15-60 minutes each time. Exercise prescription, from this perspective, may well have over emphasised the training zone, contributing to the high drop-out figures. Recent guidelines published from the ACSM (1995) embrace the concept of active living and advocate an increase in overall daily physical activity with less emphasis placed on exercise intensity. According to Marcus (1995), "simple programs to improve fitness, such as walking, are rarely offered in courses yet these may be the type of programs more suitable for a large section of the population" (p. 320). Marcus, Pinto, Simkin, Audrain and Taylor (1994) noted that older adults and women are less likely to endorse participation in vigorous exercise, but frequently report participation in light and moderate activities.

Statistics of physical activity levels vary according to region and population demographics. Studies have shown that despite a greater public awareness of the importance of exercise, in industrialised countries as little as 8-20% of the population are sufficiently active to attain maximum health

benefits, while 30-59% are essentially sedentary (Centers for Disease Control, 1990; Marcus, Simkin, Rossi, & Pinto, 1996; Stephens, Jacobs, & White, 1985). In addition, Dishman (1991) reported that the typical dropout rate from exercise programs around the world has remained approximately 50% within the first six months. If adoption and adherence rates remain low the potential health-related benefits of exercise will be limited. Low participation and poor adherence to regular exercise presents a major challenge for health promotion programs.

Dishman (1990), in an effort to explain the complexity of exercise adherence, proposed a Life-Span Interaction model (see Figure 1) that takes into account diverse disciplines (psychological, physiological and socio-environmental) and identifies a number of determinants. Dishman's model illustrated that there are various levels and stages of involvement in exercise participation. Stages are both stable and dynamic in nature (Marcus et al., 1996). Further, multiple strategies can be used as potential interventions to increase exercise participation throughout this heuristic model. Intervention approaches, to enhance exercise adherence, have been shown to be effective when they focus on the use of self-regulation techniques (Marcus, 1995). In addition, a growing body of evidence suggests that health education programs that are developed using the principles of Bandura's (1986) self-efficacy theory have shown success in maintaining a variety of health related behaviours (Jemmott & Jemmott, 1992; Jones et al., 1990; Kasen, 1992; Leviton, 1989; Magura et al., 1991; Rose, 1992).

Figure 1. **The Lifespan Interaction Model for Exercise Behaviour (Dishman 1990)**

Psychological approaches, however, tend to centre the control for a behaviour change on the individual. In contrast, contemporary adult educational approaches to behaviour change situate the individual in a broader social, historic, economic, political, organisational and cultural context. Sociological perspectives of adult learning theory, particularly, critical self-directed learning has received widespread attention in adult education and provides guidance for broad social and other contextual interventions in a worksite health promotion program.

Green and Cargo (1994) called for greater collaboration between the disciplines in academia to close the gap between theory and practice and to develop and test progressive innovations. They stated, "As yet such integration has not emerged as a standard in health promotion, let alone workplace health promotion" (p.512). The workplace context provides a unique setting to reach a large proportion of society for multiple health promotion initiatives. Effective workplace interventions are likely to be those that combine environmental and behavioural change models from a variety of fields and are tailored, as much as resources will allow, to the needs and circumstances of the workplace culture and the individuals participating in the program (Green & Cargo, 1994).

"State of the art" education programs that are packaged and exported to worksite venues fail to consider, however, the needs and circumstances of those local employees wishing to benefit from the learning experience. In addition to psychosocial concepts for behaviour change, an integral part of

program development in health promotion should take into account the contextual application of an educational program by addressing theoretical concepts and frameworks from the literature in worksite health promotion, program planning, adult teaching, and program evaluation.

For the purpose of this study, the researcher developed a worksite health promotion program (Lifestyle Skills Motivation) by combining the literature on exercise science, health promotion and adult education. The aim of the program was to empower participants individually and collectively with the knowledge, attitudes and specific skills to think critically and to self-direct an exercise behaviour change. A learner-centred approach was central to the worksite Lifestyle Skills Motivation program. Learners were encouraged to be active participants in the learning process. Furthermore, it was assumed that people learn in a variety of ways, they are at different stages of learning and they progress at different rates. From this perspective of teaching, the teacher focused on enhancing critical thinking and self-directed learning skills through a challenging, supporting and guiding environment (Pratt, 1992). Learning was thus viewed as an individual and social contextual process.

Few studies in the workplace context have focused on integrated programs, combining behaviour change models drawn from a variety of fields to facilitate exercise behaviour change. Even less is known about the application of learning after the completion of worksite health promotion programs. A

variety of related literature has been used to address application. For example, program evaluation (Sork, 1990), diffusion (Rogers, 1983) and transfer of learning (Baldwin & Ford, 1988). Ford (1994) defined application as the extent to which knowledge, attitudes and skills from an educational program are subsequently used. Application in the classroom context is relatively easy to assess. Implicit in educational programs, however, is that change is expected beyond the classroom context and into the home, workplace or community setting. Post-educational application thus occurs in contextually-bound, dynamic and relatively unpredictable patterns of human interaction. Post-educational application is where learning outcomes from educational programs and intentions of adult participants interface with the realities of everyday life. Multidisciplinary and multiparadigmatic research is, therefore, required to study this phenomenon (Ottoson, 1995). The study of post-educational application in complex social settings offers a unique insight into factors and processes that influence how program intentions became transformed into behavioural and non-behavioural outcomes.

The purpose of this study was to gain a better understanding of post-educational application following an integrated worksite health promotion program. Green and Kreuter's (1991) Precede-Proceed model for health promotion was used as the guiding framework for the planning and evaluation processes. The Precede phase of the model ensured that the program was tailored to the needs and circumstances of employees

attending the worksite health promotion program. The Proceed phase is a realistic and flexible framework to investigate post-educational application because of its emphasis on process and broad perspective on context. The principle of participation was applied throughout the twelve-month implementation of this research project.

The Lifestyle Skills Motivation program has shown evidence of success in a community setting (Hubball, 1994) and in pilot studies that have been implemented in a university and a corporate workplace setting. For the purpose of this study, data were gathered pertaining to post-educational application of a worksite program offered to clerical employees in the Department of Housing and Conferences at the University of British Columbia (UBC).

Purpose of Study

The purpose of this study was to gain a better understanding of the effects of, and the application of learning following, an integrated worksite health promotion program that was developed from theoretical concepts and intervention strategies drawn from a variety of fields. The following objectives and research questions, guided by Green and Kreuter's (1991) Precede-Proceed framework, facilitated this investigation:

Objectives and Research Questions

(1) **To identify changes in selected outcome variables.**
Exercise self-efficacy, exercise behaviour and the stages
of exercise behaviour change are considered key variables
in the exercise motivation literature and they are an
integral part of the learning outcomes for this worksite
Lifestyle Skills Motivation program. To compare changes in
these outcome variables at various time periods and between
participants from the intervention program and those from
a "waiting-list" control group, provides additional
evidence to support the data gathered with respect to
post-educational application.

**(Q1) What changes occurred with respect to exercise behaviour,
self-efficacy and the stages of exercise behaviour change
that can be measured quantitatively throughout the duration
of the four-month investigation period?**

(2) **To describe factors that affect post-educational
application.** This provides understanding of multiple
factors that influence whether and how learning is applied
in the context of post-educational application.

**(Q2) What factors facilitated or hindered exercise
participation in the context of application?**

(3)   **To describe whether and how learning is applied.** The
       program is considered a complex set of processes as well as
       a complete unit. A richness of learner feedback pertaining
       to the process of application provides a better
       understanding about how and why particular knowledge,
       attitudes, skills and behaviours embedded within the
       worksite health promotion program are applied in a variety
       of local settings.

(Q3)   **How and why was learning applied in the context of
       application?**

(4)   **To describe alternative post-educational outcomes.**
       Information regarding intended and unintended
       outcomes provides a better understanding about why
       certain aspects of the program, or the program as a
       whole, had meaning to program participants and workplace
       officials beyond their utility to enhance critical self-
       directed learning for an exercise behaviour change.

(Q4)   **What were alternative outcomes from the worksite health
       promotion program?**

Significance of Study

Research can offer much assistance in planning and
implementing programs, especially in providing a meaningful
interdisciplinary analysis that has direct implications for
practice (Vertinsky, 1989). Combining theoretical concepts and

intervention strategies from a variety of fields to implement interdisciplinary worksite health promotion programs, however, is generally seen as an innovation. As such, there is a need to describe program development and study post-educational application. Single variable research is inadequate to capture the complexities of the multifaceted process of post-educational application. Ottoson (in press) analysed post-educational applications and concluded that adult educators cannot take for granted that well-intended policies and well-planned programs achieve intended outcomes.

This study applied a multifaceted approach to the development and evaluation of an integrated worksite health promotion program. Behaviour change models and intervention strategies from health promotion, adult education and human kinetics were integrated to develop the intervention program. Second, evaluation research for this study was situated in a post-empiricist perspective, however, intervention and data collection strategies from multiple epistemologies were employed. The findings of this research could make a significant contribution to the multidisciplinary field of program development and research methodology pertaining to worksite interventions for exercise behaviour change. Furthermore, these findings have direct implications for health professional training in order to facilitate critical thinking and self-directed learning for health behaviour change.

Glossary of Terms

Critical Self-Directed Learning

In the context of this study, critical self-directed learning refers to rigorous, creative and critically reflective thoughts pertaining to individual and collective exercise behaviour change.

Exercise

"Exercise is leisure-time physical activity which a person chooses to undertake during his or her discretionary time with the intention of developing physical and/or physiological fitness" (Bouchard et al., 1990, p.6).

Health Education

"Any combination of learning opportunities designed to facilitate voluntary actions conducive to the health of individuals, groups, or communities" (Green and Ottoson, 1994, p.669).

Health Promotion

"Any planned combination of educational, political, regulatory and organisational supports for actions and conditions of living conducive to the health of individuals, groups, or communities" (Green and Kreuter, 1991, p.432).

Implementation

"Implementation is an iterative process in which ideas, expressed as policy, are transformed into behaviour, expressed as a social action" (Ottoson and Green, 1987, p.362).

Intervention

In the context of this study, intervention refers to any process that engages subjects, in some degree, to think critically and self-direct exercise behaviour change.

Lifestyle

"Any combination of specific practices and environmental conditions reflecting patterns of living influenced by family history, culture, and socio-economic circumstances" (Green & Ottoson, 1994, p.670).

Application

"The extent to which knowledge, attitudes and skills from an educational program are subsequently used" (Ford, 1994, p.22).

Program Evaluation

"the collection and use of information to make decisions about an educational program where many types of decision are to be made and many varieties of information are useful" (Cronbach, 1963, p.672)

Self-Efficacy

"Individuals' specific confidence in their use of their skills and abilities to overcome barriers to perform a particular behaviour at the level that will lead to an expected outcome" (Bandura, 1986).

Self-Regulation

"Self-regulation implies the solitary pursuit of goal-directed behaviour without immediate external control while minimising the limitations imposed by one's physical and social environment" (Kirschenbaum & Wittrock, 1984, p.82).

CHAPTER 2
LITERATURE REVIEW

Introduction

Various conceptual models and frameworks inform us that multiple factors influence one's participation in regular exercise (Dishman, 1990; Green & Kreuter, 1991). The multidisciplinary nature of this study requires careful consideration and organisation of the relevant literature pertaining to the development and evaluation of worksite health promotion programs for exercise behaviour change. The following review examines the literature in exercise psychology, adult education and health promotion for broad theoretical concepts and intervention strategies to enhance post-educational application of exercise behaviour change. The review is organised into two areas of program development: intervention strategies for exercise behaviour change and program implementation. Intervention strategies for exercise behaviour change focuses on behavioural and broad educational approaches, in particular, self-efficacy and critical self-directed learning. Program implementation examines organisational approaches and theoretical frameworks and concepts in the literature from worksite health promotion, program planning, adult teaching and program evaluation. The literature is assessed to provide guidance for the development and evaluation of a worksite health promotion program for application of exercise behaviour change.

PROGRAM DEVELOPMENT (Part I)

Intervention strategies for exercise behaviour change

The literature in exercise psychology and adult education will be examined to provide guidance for psychosocial behaviour change strategies to enhance post-educational application of exercise behaviour change.

(a) PSYCHOLOGICAL APPROACHES TO BEHAVIOUR CHANGE

Research on behavioural change has been a core area in the study of exercise psychology. A number of theories have evolved in the literature that have attempted to explain how human beings change behaviour. This review presents various approaches to behaviour change that have influenced health promotion interventions.

Classical conditioning

A classical conditioning approach to behavioural change was introduced by Pavlov (1920), a Russian physiologist. He demonstrated that a reflex could be elicited automatically from a stimulus without any cognitive processing. This became known as the stimulus-response reflex. Exercise behaviour change, from this perspective, has been seen in many forms, for example, providing worksite exercise classes, providing exercise equipment, exercise with a personal trainer or time-imposed exercise expectations. The limitation of this approach

is that it clearly focuses on shaping the environment by external means rather than taking into account the needs of the individual or efforts to empower the individual toward self-directed regular exercise behaviour. Consequently, if the individual is not predisposed to the specific exercise behaviour and/or if the exercise behaviour is not reinforced, the exercise behaviour is unlikely to be initiated or sustained through this approach to behaviour change.

Operant conditioning

An operant conditioning approach to behavioural change developed from classical conditioning. Operant behaviour refers to a freely emitted response pattern to bring about changes resulting in reward or reinforcement (Skinner, 1938). Essentially, this approach to behaviour change is characterised through pairing a stimulus with a reward. This approach thus focuses on the relationship between a behaviour and its consequences through the use of positive or negative reinforcements. The more often a conditioned stimulus is paired with a reward and the closer in time that the reward follows the stimulus, the more reinforcing it becomes. Exercise behaviour change intervention strategies that have originated from this perspective have included collecting "points" for exercise behaviour that can be subsequently used toward a personal treat (e.g., buying new clothes).

Operant conditioning, therefore, assumes that a behaviour will be repeated if the consequences of performing that behaviour are rewarding. A limitation of this approach to

behaviour change, however, is that rapid extinction is characteristic when there is no further pairing of stimulus and reward. Although this approach builds on classical conditioning and may do so by involving the individual somewhat in a cognitive capacity, the locus of control remains, to some extent, external. Consequently, the motivation to initiate and sustain exercise behaviour relies simply on reinforcing factors rather than empowering the individual toward the self-directed implementation of regular exercise.

Theory of reasoned action

The Theory of Reasoned Action (TRA) has also been used extensively to explain health behaviour. This model was proposed by Ajzen and Fishbein (1980) and is concerned with the causal antecedents of volitional behaviour. The theory was named after its underlying assumptions that people are rational, make systematic use of information that is available to them, and consider the implications of a particular behaviour before engaging in it. The TRA thus interprets social behaviour at the level of individual decision making (Godin, 1994).

Central to the TRA is the concept of behavioural intentions. These are seen as the final step before subsequent behaviour. The TRA proposes that specific measures of attitude, in conjunction with social influences, will predict behavioural intentions. The attitude component of the model is a function of the beliefs held about a specific behaviour as

well as the value placed on the likely outcome. The social normative component is comprised of the beliefs of significant others and the extent that one is motivated to comply with these beliefs. Research tends to support that the attitude component is a more powerful predictor of intentions than the social normative component. The relative importance of either the attitude or the normative component, however, will largely depend on the situation. For example, some adolescent health behaviours may be strongly influenced by the social normative component though will be less so in adulthood.

Godin et al. (1986) applied this model to children's exercise behaviour. They found that the normative component was less predictive of intentions than the attitudinal component. Furthermore, a child's intention to exercise was found to be related to his or her mother's intention to participate in physical activity, father's current activity level and family's socio-economic status. In a review of twelve published studies using the TRA, Godin (1994) found that the correlation between intention and exercise behaviour averaged 0.55, i.e., 30% of the variability in behaviour was explained by intention alone. In general, however, studies have shown equivocal results when using this model to predict exercise behaviour.

A number of limitations are inherent when using this model to understand exercise behaviour. First, the TRA is based on a "snap-shot" of exercise behaviour and therefore does not take into account a person's previous experience or

stage of exercise involvement. Second, the unidirectional nature of this model fails to recognise that variables in the model can act in a reciprocal manner. Third, the TRA was developed for behaviours under volitional control and therefore may not predict behaviours where other factors (social contextual barriers) may be considered more influential. Fourth, poor measures of exercise behaviour (self-report, intentions to exercise) that have been used in previous studies have escalated the problems when using this model to explain exercise behaviour. Finally, it also requires tedious repetition in the questionnaire to measure the components of the model, and it does not lend itself easily to intervention planning. Essentially, the TRA relies predominantly on cognitive factors (intentions, knowledge and beliefs in the expectancy value) to predict exercise behaviour. Research and practice, however, suggest that changes in knowledge, beliefs and attitudes may be necessary but they are not sufficient to induce or sustain an exercise behaviour change. The TRA does provide some guidance, however, for explaining and elaborating the dynamics of predisposing factors in broader conceptual frameworks for explaining exercise behaviour.

Social Learning Theory

The social influence on learning behaviour was first introduced by Miller and Dollard (1941). Using animals and humans, they showed how behaviour could be learned from imitation. Bandura and Walters (1963) investigated this idea

further and found that children could learn a specific behaviour by observing other children perform that behaviour and receive a reward. Rotter (1966) applied these principles of social learning theory to clinical psychology and developed the concepts of "generalised expectancies" and "locus of control." "Generalised expectancies" refers to the value a person places on the results of a particular behaviour. "Locus of control" refers to whether the person perceives rewards for the behaviour to be controlled by oneself ("internal locus") or by others ("external locus"). Building on previous research and Rotter's work specifically, Bandura (1977) developed a conceptual foundation for the theory of Social Learning and renamed Social Learning Theory to "Social Cognitive Theory" (SCT).

Social Cognitive Theory (SCT)

According to Bandura (1986b), two main organising themes characterise SCT: reciprocal determinism and vicarious learning. Reciprocal determinism refers to the interdependent and interactive relationship between the person, environment and behaviour factors. Bandura thus viewed behaviour change as a dynamic and multidirectional process such that a change in one of the factors will lead to a change in the other two. He postulated, however, that individuals are not simply passive recipients of the environment, but instead are capable of self-regulating their environment as well as their own behaviour. The second main organising theme in SCT is vicarious learning. Bandura described vicarious learning as

the mediation of imaginal and verbal codes that become conditioned to external stimuli. He suggested that vicarious learning occurs when an individual constructs a schema of a behaviour and its consequences from observing another person(s) go through the same, "actual" process. Bandura noted, however, that the effectiveness of vicarious learning is increased when a model has a similar demographic profile to that of the learner and when the model's level of competence or experience is not perceived as too superior to or too different from that of the learner. Maiman, Green, Gibson and MacKenzie (1979) supported this assertion from study findings with health aides for an adult asthma health education program.

SCT thus provides multiple intervention opportunities to affect behaviour. Perry, Baronowski and Parcel (1990), however, pointed out that a common fault with the application of this theory in health promotion is to focus on too few variables and to exclude too many. This is symptomatic of experimental research which often permits the analysis of only a few isolated variables and therefore tends to oversimplify reality. Perry et al. recommended a three-stage process to apply social learning theory adequately in health promotion projects: (1) identify the goal of the program, (2) identify the principles of social learning theory most likely to lead to change in the behaviour, and (3) match strategies to the principles of social learning theory.

Dzewaltowski (1989) found that the SCT accounted for a higher proportion of variance in exercise behaviour than the Theory of Reasoned Action and thus concluded that SCT was a superior theoretical model for predicting exercise behaviour. Compared to previous psychological approaches, social cognitive theory provides a broad conceptual framework to explain and understand the process of behavioural change. It is important to note, however, that within the broad causal triadic system, SCT places an emphasis on examining cognitive processes (Dzwaltowski, 1994). Furthermore, SCT assumes that individuals are capable of engaging in a rational analysis of their exercise behaviour, are capable of self-regulating exercise behaviour, and can learn through vicarious experience.

Self-Efficacy Theory and exercise behaviour

Bandura (1977, 1986) postulated the existence of a key motivational construct in the SCT of human thought and action which he termed "self-efficacy." SCT is thus seen as the "parent" theory of Self-Efficacy Theory (SET). According to Bandura (1986a), self-efficacy refers to "an individual's specific confidence in their use of their skills and abilities to overcome barriers to perform a particular behaviour at the level that will lead to an outcome"(p. 2). An individual's self-efficacy is viewed as central to his or her decision to participate in a specific behaviour.

Bandura (1986a) clearly differentiated between efficacy expectations and outcome expectancies. In terms of exercise motivation, efficacy expectations refer to an individual's belief in his or her own capability to participate in regular exercise. Consequently, exercise efficacy expectations influence the activities chosen, the effort expended, the degree of persistence exhibited in the face of obstacles or barriers, emotional reactions (e.g., joy, anxiety, etc.), and are therefore subject to change as a function of environmental factors. In contrast, outcome expectations refer to one's belief that regular exercise will produce a particular result (e.g., reduce anxiety, increase fitness, reduce weight). High efficacy beliefs regarding one's capability to participate successfully and adhere to exercise are likely to lead to positive mastery experiences, and, depending on the outcome of those mastery experiences, should therefore influence one's future exercise participation and expectations.

A growing body of literature addresses the problem of adherence to exercise classes by focusing on exercise self-efficacy (Sallis, Haskell, Fortmann, Vranizan, Taylor, & Solomon, 1986; Garcia & King, 1991; McAuley, Courneys, & Lettunich, 1991; McAuley & Jacobson, 1991; and Marcus et al., 1992). Bouchard et al. (1990) concluded that active people tend to be well-motivated to persist with exercise, and possess problem-solving skills which focus on self regulatory strategies that can be learned (e.g., goal setting, exercise strategies, minimising environmental barriers to

implementation, and monitoring and reinforcing their actions).
Supporting this view, studies have indicated that health
education programs based on Bandura's principles of self-
efficacy theory have shown success in maintaining a variety of
health behaviours, such as condom-use (Jemmott & Jemmott,
1992); drug refusal (Jones et al., 1990); AIDS preventative
behaviour (Kasen, 1992, Magura et al., 1991); smoking
cessation (DiClemente et al., 1985); adult and adolescent
health (Leviton, 1989, Sprunger & Pellaux, 1989); heart
disease prevention (Rose, 1992); and weight control (Bernier &
Avard, 1986). Strecher et al. (1986), in a literature review
regarding self-efficacy and health behaviour change, found a
consistently positive relationship between self-efficacy and
health behaviour change and maintenance. The appeal of SET is
that it expresses the dominant purpose of health promotion of
enabling people to increase cognitive control over, and to
improve their health. Furthermore, it provides direction for
the design of intervention strategies that are intended to
increase and maintain health behaviour.

Self-regulation and exercise self-efficacy

Inherent in the theory of self-efficacy is the idea that
people are capable of learning how to self-regulate their own
behaviour. Self-regulation can be described as a self-oriented
feedback loop involving a variety of complex interactions
between systematic and continuous self-observation of
performance, cognition, emotional states, physiology and
environmental constraints (Zimmerman & Schunk, 1989). Self-

regulation, therefore, incorporates diverse and interconnected cognitive-behavioural skills where an individual is able to monitor the effectiveness of his or her strategies and respond to this feedback by changes in self-perception (e.g., imagery selection) or changes in behaviour (e.g., time management), thus becoming an active participant in his or her own learning. According to Weber and Wertheim (1989), poor self-regulatory cognitive and behavioural skills for overcoming barriers are a main reason why many people who intend to be active remain sedentary.

Many reasons for not exercising are given by those who intend to exercise regularly, but who do not. It appears that a number of real and perceived barriers including inconvenience, inaccessible locations, exercise boredom, activity cost, work conflicts, lack of self-motivation, and a lack of time or energy tend to hinder long-term exercise participation. Biddle and Mutrie (1991) suggested, however, that adequate self-regulatory strategies (e.g., time management, goals setting, self-monitoring, tension control, imagery) for overcoming these barriers, can increase self-efficacy and therefore reduce the difficulty that people experience in adhering to regular exercise. Alternatively, inadequate self-regulatory strategies can lead to decreased feelings of self-efficacy, a period of inactivity, and possible feelings of guilt and lack of control, which in turn would undermine self-efficacy and could increase the probability of sustained inactivity. Although this view tends

to underscore the importance of adverse environments or lack
of social support, self-efficacy is considered to be an
important factor in maintaining habitual physical activity.
Schunk and Carbonari (1984) concluded that a strong sense of
efficacy for behaving in a healthful fashion is central to the
self-regulation of one's life. The following examples of self-
regulatory cognitive and behavioural skills have shown
evidence in the literature to influence exercise behaviour.

Enlisting social support, One of the many reasons given
for dropping out of regular exercise is the lack of social
support from significant others. This tends to act as negative
reinforcement, but can be overcome by encouraging a partner to
share the exercise commitment or enlisting social support from
someone who has a positive attitude to exercise. Thow and
Newton (1990) suggested that mutual support can be encouraged
when one attends a class meeting as part of an exercise plan.
Co-operative learning activities in health education classes
also fosters a supportive network that can assist with the
motivation to overcome barriers that prevent exercise
participation.

Decision-balance sheet, A decision-balance sheet can be
used to identify a person's motives and personal cost-benefit
analysis for participating in regular exercise. This can help
people to clarify the value they place on participating in
regular exercise and recognise the advantages and
disadvantages of increasing their levels of physical activity.
Wankel (1985) suggested that a decision balance sheet can also

be used initially to help people identify the barriers that may prevent their goals from being achieved.

Stimulus control, A variety of exercise cues (e.g., reminders in diary, clothing prepared before hand and placed in a visible place, slogans or posters) placed at strategic places in one's environment may act as motivational prompts to increase the likelihood of exercise participation. Brownwell, Stunkard and Albaum (1980) used a poster campaign at prominent places in a workplace setting and found that this technique was successful for increasing the use of stairs rather than the elevator.

Goal setting, According to Bandura (1986), performance achievement and the feelings that accompany success are a main determinant of self-efficacy. Appropriate goal setting provides a means for directing behaviour toward the achievement of tasks and therefore can be an effective strategy for enhancing health behaviour change (Strecher et al., 1996). Atkins et al. (1984), found that subjects in an experimental group who declared their goals in a public way, or by "contracting" had significantly higher levels of commitment and adherence to exercise than those subjects in control groups who did not sign agreements or declare targets. It is important to note however, that external reinforcements need to be gradually phased out to the point that the exercise behaviour is being maintained by intrinsic reinforcement from the exercise experience itself (Green, Wilson and Lovato, 1986). Cooper's (1982) aerobic points system was also shown to

increase exercise adherence. This method allocated specific points for participating in different activities (depending upon the duration and intensity) such that the weekly goal was to score a total of 30 points.

Effective goal setting begins with the identification of a long term goal (e.g., to brisk walk regularly for 20 minutes and at least 3 times per week) which is then broken down into intermediate and short term goals. Goals should be time-phased, specific, but be set in a flexible way so that they can be achieved realistically and progressively. Martin et al. (1984) showed that subjects who were randomly assigned to receive encouragement to set their own flexible goals had a greater adherence to regular exercise than those subjects who had fixed goals. Flexible goal setting and time management ensures that regular participation in exercise can be achieved without increasing self-imposed pressure to meet set deadlines or targets. This also tends to appeal to those people who do not respond to tightly structured plans.

Self-monitoring, Self-monitoring provides a valuable source of information regarding the progress towards the achievement of personal goals. According to Juneau, Rogers, Desantos, Yee, Evans and Bohn (1987), periodic monitoring and reviewing of exercise behaviour can be a powerful means of positive reinforcement. Self-monitoring can take the form of: exercise diaries, heart rate monitoring, Borg rating of perceived exertion or assessing thoughts and feelings about the exercise experience etc. Exercise diary information

typically includes: times, activity type, distances, effort, weather, mood state, and other subjective appraisals. To this extent however, self-monitoring can be onerous to some people and require yet further motivation in addition to that of the demands of exercise participation. Therefore less demanding alternatives without written requirements can include pulse rate monitoring to reinforce effort given, or mentally noting perceived exertion, thoughts and feelings. Rejeski and Kenney (1988) found that self-monitoring in the form of thoughts and feelings was a useful way to analyse and restructure negative thought patterns which could cause drop-out. Success in self-regulation is largely dependent on the accuracy of self-observation as this process provides the necessary information to make appropriate changes and enhance performance. Zimmerman and Schunk (1989) noted, however, that self-regulation often requires more preparation time, vigilance, and effort. Therefore, unless the outcomes of these efforts are sufficiently attractive, people may not be motivated to self-regulate.

Time management, Perceived lack of time is a main concern for those who intend to exercise, but do not (Godin, 1986). Studies, however, found no evidence to suggest that people who did not exercise had any less time than people who exercised (Canadian National Health Promotion Survey, 1988, Shephard, 1985). This may suggest that the problem is less about having time available but rather about making better use of available time through time management techniques. It could also be

interpreted as a simple case of post-hoc rationalisation. People who set their priorities implicitly rather than explicitly probably use time as an excuse for not doing the things lower on their implicit hierarchy of priorities. If it is a matter of poor time management, however, then weekly and daily time management strategies have the potential to be effective methods of ensuring that regular exercise will take place and hence be part of a person's lifestyle. The process of time management involves an individual identifying his or her fixed and desired commitments that he or she would like to fit into a daily or weekly schedule. These commitments are then placed into a detailed and structured schedule in order of priority. Prioritising is thus a major component of time management. If no free time is available for exercise then alternative methods of increasing existing activity time can be achieved (e.g., walking or cycling either part or all of the way to work, using the stairs regularly rather than using an elevator, and walking during the lunch hour period). Buffone, Sachs and Dowd (1984), suggested that an advantage of exercising on specific days and even at specific times is that exercise becomes an integral part of a person's day. Implicit in this view is that the likelihood of missing exercise is reduced as the habit becomes reinforced. This approach used in isolation, however, tends to underscore the importance of predisposing factors, in particular, thoughts, feelings and sensations of the actual exercise experience.

<u>Tension control</u> The judgement of physiological arousal and emotional states is an important source of self-efficacy information (Bandura, 1986). Hagberg (1990) suggested that exercise is a natural release mechanism for effectively dealing with stress and tension. However, it is also a physical stressor, thus the nature of the exercise session will determine whether this is perceived as a positive or a negative stressor. It is widely believed that there is an inverted "U" relationship between physical performance and arousal levels. According to Albinson and Bull (1988), there is an ideal range of arousal at the centre of this curve where one achieves an optimal performing state, though this will vary between situations and between people. At an optimal range of arousal, one's performance is characterised by rational, creative, relaxed and fluent movements, and efficient cognition. As arousal further increases, however, there is an associated performance decrement that is characterised by overload, tension, discomfort, reduced sensory acuity, narrowing of attentional focus, and negative emotions (Albinson & Bull, 1988). Conversely, too little arousal can also produce a performance decrement. This is characterised by a lack of goals, frustration, boredom, lack of stimulus and reduced efficiency. Therefore managing one's level of arousal during exercise participation can affect the feelings that accompany the exercise experience. Hardy and Rejeski (1989) concluded that both effort perception and the feelings associated with such effort were important factors

that could influence the perceived enjoyment, reinforcement and likelihood of maintaining habitual physical activity.

There are many ways to control arousal levels using sensory input and relaxation methods. However, it requires regular practice to become proficient at managing one's level of arousal. The following examples are effective methods for increasing or decreasing arousal levels:

(1) sounds / self talk / music in the exercise environment

(2) sights / imagery / light or dark exercise environment

(3) smells in the exercise environment

(4) deep slow breathing

(5) attention focus (dissociation strategies)

(6) speed of exercise movements (slow, rhythmic).

These methods depend on the person and the nature of the specific sensory stimulus during the participation in health-related exercise. For example, one may feel less tension during a brisk walk by maintaining a constant sustainable speed, attending to pleasurable thoughts, or the fresh air and foliage of the surrounding environment, than focusing on negative emotions, the exertion of the exercise experience, or focusing on one feature in the vicinity of the exercise session.

Imagery Imagery refers to the internal process of using visual, verbal and kinaesthetic images to create thoughts, images, sensations, and feelings (Albinson & Bull, 1988). This technique can be used in many different ways and has been very successful with the use of athletes to improve their

performance and increase their coping strategies to face errors (Vealey, 1986). In a similar way, positive imagery has a potential role in enhancing exercise adherence. For example, a person could imagine a potential disruption to participating in exercise and then use imagery to imagine possible successful solutions that overcome this disruption. Second, a person may use imagery to reinforce his or her adherence to exercise by creating successful images of themselves with: muscle tone, slimness, and more energy if they adhere to regular exercise. Third, the use of imagery has a potent role to play in the thought processes that occur during participation in exercise. For example, one can dissociate to pleasurable thoughts and create the optimal performing state which is enjoyable, comfortable and evokes well-being. Fourth, imagery can be used as an effective method of modelling. According to Bandura (1986), seeing and modelling other people of similar disposition who successfully perform the desired behaviour (participation in exercise) can increase self-efficacy. Vicarious learning through imagery can thus reduce the resistance that stems from the uncertainty of the outcome and allows the learner to extract the essential elements from the observation to adopt regular exercise behaviour.

Attention control Attention control is the ability to select and focus one's attention on the relevant information (sight, sounds, thoughts), while being aware of the non relevant information but paying no attention to it, i.e., letting those thoughts go out of one's mind. Association and

dissociation are attention strategies used during physical activity. In association, performers focus on their bodily sensations (respiration, temperature, muscular feelings and abdominal sensations etc.). Associating to one's perceived level of exertion is likely to maintain appropriate intensity levels and self-pacing for performance-related exercise, thus avoiding the negative consequences of fatigue or injury (Buffone et al., 1984). However, in terms of health-related exercise, the literature supports greater adherence when people dissociate and purposely cut themselves off from sensory feedback, and instead focus on distracting thoughts such as aspects of the route ahead, talking, singing, pleasurable or successful problem-solving thoughts, etc. (Martin et al., 1984). Johnson and Siegal (1992) examined the effect of different association and dissociation techniques on effort perception. They found that groups who employed dissociation strategies during aerobic exercise perceived the effort to be much less during submaximal exercise than the group who used an association strategy. Thus, it appears that dissociation strategies can enhance exercise adherence by reducing the perception of effort, the physical discomfort, and exercise boredom. Dissociation is most easily achieved at a gentle slow pace, once the body is locked into a steady state speed and gait or rhythm the person is relaxed.

Positive thinking Bandura (1986) suggested that situational factors dominate over personal trait factors in determining self-confidence. Confidence is task-specific and

can be described as a state of thinking, feeling, and behaving. Attributions are the way that people typically explain behaviour. Thus, in terms of exercise participation, attributions can potentially affect future emotions, thoughts and subsequent exercise behaviour. For example, if people perceive that the reasons why they are inactive are due to factors beyond their control (e.g., lack of ability), they are likely to remain inactive. In contrast, if they attribute their lack of activity to controllable factors (e.g., ineffective time management, poor goal setting, and inappropriate focusing), they are more likely to feel confident and thus succeed at making changes in the future.

According to Kendzierski and Johnson (1993), cognitive behaviour theory implies that to change behaviour, one must first identify and then modify the maladaptive thoughts which support it. Verbal persuasion, in the form of positive self-talk, is identified as an important source of self-efficacy information. Wilkes and Summers (1984) found that personal self-talk and personal perceptions of the costs and benefits of exercise were an effective strategy for increasing exercise self-efficacy and influencing behaviour. Buffone, Sachs and Dowd (1984) suggested that maladaptive self-statements that dwell on self-doubt or obstacles are detrimental to exercise adherence, e.g., "I'm just not the active type" or "I've got no will power." Studies have shown that cognitive restructuring (re-phrasing negative statements to positive and attributing set-backs to unstable factors rather than stable

personality characteristics) coupled with immediate rescheduling of the missed walking/jogging session enhanced exercise adherence (Atkins et al., 1984; King et al., 1988). For example, "I can walk to work at least once each week", "I feel good after I have been exercising", "If I'm covered up, I can go out in any weather", or "It's great to be outdoors and in the fresh air, whatever the weather." Gauvin (1990) concluded that exercise adherers tended to engage in positive and motivational self-talk while drop-outs and sedentary people engaged in negative and derogatory self-talk.

Table 1 represents a summary of studies following index searches on Medline, Psych Abstracts, ERIC, CD Rom (Sportsdiscus), and a personal library search of relevant publications, pertaining to evaluations of individual and combined self-regulatory cognitive and behavioural skills programs on exercise behaviour.

Table 1. Self-Regulatory Cognitive and Behavioural
Intervention Strategies and Exercise Behaviour

Author, Date	Subjects/ Sample Size/ Context	Physical Activity Setting/ Duration	Intervention Strategies	Design	Outcomes
Atkins et al. (1984)	76 male and female, COPD patients	Daily walking X 3 months	Cognitive modification, behavioural modification, cognitive-behavioural modification and attention control	Experimental	Significant increase and maintenance of walking in cognitive-behavioural group
Baile and Engel (1979)	7 male, CHD patients	Walking, 12-16 weeks	Goal setting, self-monitoring	Pre-experimental	Increase in self-report exercise levels
Brownwell et al. (1980)	24,603 male and female, community adults	Stair-climbing, 1 month observations	Stimulus control (poster prompts)	Quasi-experimental	Increase in stair-climbing, maintenance at 1 month, 3-month follow-up.
Hoyt and Janis (1975)	50 females, faculty and graduate students	Exercise class, ACSM, 7 weeks	Decision-balance sheet	Experimental	Increase in attendance for 5 weeks
Jarvie and Thompson (1985)	16 overweight males and females	Home exercise cycle 17-22 weeks	Self-monitoring	Quasi-experimental	Slight increase in exercise frequency
Johnson and Siegal (1993)	44 college females	Bicycle ergometre, 60% VO2 max	Attention control, dissociation/as sociation and rating of perceived exertion (RPE)	Experimental	Dissociation was significantly related to reduced RPE. while no significant differences in heart rate
Juneau et al. (1987)	120 male and female Lockheed employees	Home based walk/jog program, 24 weeks	Self-monitoring , goal setting	Experimental	Increase in VO2 max., male decrease in weight
Martin et al. (1984)	143 male and female adults, community	Walk/jog, 2 X per week, 10-12 weeks	Goal setting, modelling, feedback, attention control	Quasi-experimental	Increase in attendance and maintenance of exercise at 3-month follow-up

Oldridge and Jones (1983)	120 male CHD patients	Walking ACSM, 6 months	Goal setting, self-monitoring	Experimental	Increase in attendance
Wankel et al. (1985)	52 female adults, community	Exercise class X 1 per week, 5 weeks	Decision-balance sheet, social support	Experimental	Increase in attendance
Weber and Wertheim (1989)	55 female adults, community	Exercise class X 12 weeks	Self-monitoring, social reinforcement	Experimental	Increase in attendance (self-monitoring)

In a review of the behaviour modification and exercise adherence literature, Leith and Taylor (1992) concluded that certain interventions designed to develop a variety of self-regulatory cognitive and behavioural skills have contributed significantly to increasing and maintaining physical activity levels (e.g., self-monitoring and feedback, Martin, Dubbert, Katell, Thompson, Raczynski, Lake, Smith, Webster, Sikova, & Cohen, 1984, Oldridge & Jones, 1983, and Owen, Lee, & Sedgewick, 1987; decision making, Wankel, Yardley, & Graham, 1985; and relapse prevention training, Belisle, Roskies, & Levesque, 1987). Dishman (1991) reported that when these techniques are compared with no-treatment control groups, they are usually associated with a 10-25% increase in frequency of participation, but their impact on changes in intensity and duration of physical activity are less clear. Atkins, Kaplan, Timms, Reinsch, and Loftback (1984) compared different methods of self-regulatory cognitive and behavioural modification strategies (behaviour modification, cognitive modification, cognitive behavioural modification, attention control and no treatment group) to increase adherence to a walking program

for patients suffering from chronic obstructive pulmonary disease. They found that the most effective method was the combined approach of self-regulatory cognitive and behavioural modification.

In criticism of the studies cited, they have focused almost exclusively on the application of self-regulatory cognitive-behavioural skills in a prescribed exercise setting rather than on specific health education approaches to develop these skills individually and socially for self-directed regular exercise. Further, Kendzierski and Johnson (1993, p.208) noted that, "the cognitive behavioural approach focuses attention not on the myriad of obstacles a would-be exerciser may face as he or she contemplates exercising at any given time, but on the thoughts the individual has in regard to these obstacles." In terms of behavioural change, this perspective clearly places an emphasis on predisposing factors and only indirectly on enabling and reinforcing factors. It does not, however, address environmental factors that influence a behaviour change.

Relapse prevention training and self-efficacy

Relapse Prevention Training (Marlatt & Gordon, 1985) is an example of self-regulation and incorporates a variety of cognitive and behavioural strategies for behaviour change. This was developed initially in an effort to explain the lack of adherence to abstinence in relation to addictions associated with smoking, alcohol and drugs. It is inferred that the process of exercise adherence may bear some

resemblance to the relapse effect studied in these other health contexts. However, Knapp (1988) noted that unlike those other health behaviours, the desired exercise behaviour is a low frequency yet desired behaviour. Furthermore, exercise behaviour is often more time consuming and requires more effort than most other health behaviours. The extent, therefore, to which a parallel can be drawn between exercise and addictive behaviour remains as yet unclear.

Relapse Prevention Training is based on acquiring coping strategies for unexpected disruptions which can interrupt or end previously continuous exercise. Marlatt and Gordon (1985) suggested that a lack of coping response will lead to a decrease in self-efficacy and therefore an expectancy of further relapse. This could lead to the abstinence violation effect (i.e., feelings of guilt and lack of control) and, depending upon the degree, could sustain relapse. Therefore, the magnitude of these disruptions and the probability of relapse will be reduced if the individual develops self-regulatory skills and in turn increases self-efficacy.

Following index searches on Medline, Psych Abstracts, ERIC, and CD Rom (Sportsdiscus), and a personal library search of relevant publications, Table 2 represents a summary of studies pertaining to evaluations of relapse prevention training programs on exercise behaviour.

Table 2.   Relapse Prevention Training: Self-Regulatory Cognitive and Behavioural Intervention Strategies and Exercise Behaviour

Author, date	Subjects/ Sample Size/ Context	Physical Activity Setting/ Duration	Intervention Strategies	Design	Outcomes
Belisle et al. (1987)	350 male and female, adults community	Exercise class X 2 sessions per week, 10 weeks	Relapse prevention training (R.P.T.)	Quasi-experimental	Increase in attendance and 12 week maintenance of exercise
King and Frederiksen (1984)	58 student females	Jogging ACSM X 5 weeks	R.P.T.	Experimental	Increase in jogging and self-reported maintenance at 2 months
King et al. (1988)	52 male and female Lockheed employees	Home-based walk/jogging X 1 year	R.P.T.	Experimental	Increase in frequency of exercise
Marcus and Stanton (1993)	female adults	Exercise class ACSM	R.P.T.	Experimental	No difference in attendance levels or exercise behaviour
Owen et al. (1987)	Male and female adults	Walk/jogging	R.P.T.	Quasi-experimental	No difference in exercise behaviour

Intervention studies with exercise classes have reported greater increases in both short-term frequency and long-term adherence to exercise for experimental groups who have received relapse prevention training than for control groups who received standard health information (Belisle et al., 1987; King & Fredericksen, 1984; King, Taylor, Haskell, & Debusk, 1988; and Vogel-Burger, 1990). Marcus and Stanton (1993) did not support these findings, however, and called for

more research to be conducted before conclusions on the efficacy of the relapse prevention model for increasing exercise behaviour can be reached.

Stages of behaviour change and self-efficacy

It is often easier to initiate a behavioural change than it is to maintain one. Prochaska and DiClemente's (1985) transtheoretical (addressing diverse psychological theories) model emphasises dynamic processes and stages as core dimensions for understanding how people develop toward a behavioural change. This model postulates that individuals engaging in a new behaviour do not move sequentially, but rather progress in a cyclical pattern through five stages of behaviour change. This cyclical model is consistent with evidence that success for many is achieved only after several relapses. Relapse is thus acknowledged as the norm throughout the process of a behaviour change rather than the exception. Relapse, however, can be viewed less negatively because people may reflect on the experience and gain a useful insight to strategies that may be useful to prevent relapse in the future.

Evidence is accumulating to support the efficacy of the stages of behaviour change when the transtheoretical model is applied to a variety of health behaviours (e.g., cessation of smoking, alcohol and drug use, weight control and breast cancer screening). This framework takes into account both actual health behaviour and intentions regarding future health behaviour. It has intuitive appeal for many practitioners in

health promotion who are under pressure to show some evidence of change following particular interventions. Rather than rely on insensitive behavioural measurements, the stages of behaviour change provides a relatively simple and robust measure of change that can be used to partly assess an intervention.

Marcus, Selby, Niaura and Rossi (1992) adapted this model to exercise participation and proposed that individuals move in a cyclical manner through the stages of: <u>Precontemplation</u> (no intention of exercising regularly), <u>Contemplation</u> (intention to exercise regularly), <u>Preparation</u> (not only thinking about doing exercise, but has started a limited amount of it), <u>Action</u> (recently involved in regular exercise as recommended by the American College of Sports Medicine, 1990), and <u>Maintenance</u> (engaged in regular exercise for at least six months). Within each stage of behaviour change, an individual experiences ten principle processes of change: consciousness raising, self-liberation, dramatic relief, environmental reevaluation, helping relationship, stimulus control, counter-conditioning, social liberation, self-reevaluation, and reinforcement management (Prochaska & DiClemente, 1985).

Table 3 represents a summary of yet another group of studies based on the same search strategy as with Tables 1 and 2 but with alternative key words pertaining to evaluations of stages of behaviour change intervention programs.

Table 3. **Stages of Exercise Behaviour Change: Self-Regulatory Cognitive and Behavioural Intervention Strategies and Exercise Behaviour**

Author, Date	Subjects/ Sample Size/ Context	Program Format / Physical Activity	Intervention Strategies	Design	Outcomes
Marcus et al. (1992)	610 male and female employees (77% Female)	Self-management program for exercise behaviour in the workplace, 2 sessions per week X 1 month	Developing self-efficacy, social support, behavioural contracting	Pre-experimental	Increase in stages of exercise behaviour change, self-efficacy and self-reported exercise behaviour
Prochaska et al. (1992)	184 male and female employees (90% female)	Self-management program for weight control in the workplace, 10 week program and 4 follow-up sessions	Developing self-efficacy, social support	Quasi-experimental	Increase in stages of change and weight control self-efficacy
Marcus et al. (In Press)	?	Staged-matched self-management program for exercise behaviour in the workplace, 2 sessions per week X 1 month	Developing self-efficacy, social support, behavioural contracting	Experimental	At 3-month follow-up subjects in the staged-matched intervention showed positive change in comparison to subjects in a standard self-management program

In a workplace exercise behaviour study with 431 women, Marcus, Pinto, Simkin, Audrain and Taylor (1994) found that 8.2% were in the precontemplation stage, 30.4% were in the

contemplation stage, 33.9% were in the preparation stage, 12.4% were in the action stage and 15.1% in the maintenance stage. Stages of change encompass both behaviour and behavioural intentions (Marcus et al., 1996). An assumption when using the stages of behaviour change model, however, as with most models, is that one's intentions and self-reported health practices correlate highly with actual behaviour. In addition, it is not known as yet which time frame (six months is typically used) would be appropriate for instruments to distinguish between the stages of behaviour change.

It is postulated that people vary in the time they spend in each stage before progressing. There is uncertainty in the literature, however, as to exactly which processes are involved and when specific processes are involved among the stages of behaviour change. Worksite evaluation studies, assessing stage-specific self-efficacy and stages of behaviour change intervention programs for weight control and exercise participation (Marcus, Pinto, Simkin, Audrain, & Taylor, 1994; Marcus, Selby, Niaura, & Rossi, 1992; Prochaska, Norcross, Fowler, Follick, & Abrams, 1992), have found sufficient evidence to advocate for the differential employment of selected change processes at strategic times in the course of change, in order to meet the specific needs of those who are expected to change.

Marcus et al. (1992) studied 1,063 governmental employees and found that employees could be differentiated by the stages of exercise behaviour change and exercise self-efficacy. A

significant relationship between self-efficacy and the stages of exercise behaviour change suggests that intervention programs should focus on developing a range of self-regulatory cognitive and behavioural skills in order to increase self-efficacy for individuals who are at different stages of exercise involvement. Research has recently demonstrated the utility of integrating theories of self-efficacy, stages of behaviour change and reasoned action in the prediction of regular exercise (Courneya, 1995; Dzewaltoski, 1993; Godin, 1994; McAuley & Courneya, 1993).

Developing exercise self-efficacy

According to Bandura (1986), there are four main sources whereby self-efficacy can be increased: performance attainment, vicarious experience, verbal and social persuasion, and control of physiological and emotional states. These sources are described and examples of selective self-regulatory cognitive and behavioural skills are identified that can be developed to increase particular sources of self-efficacy. Performance attainment is the most influential source of self-efficacy information and is based on authentic mastery experiences by the individual. This can be developed through the use of the following examples of self-regulatory cognitive and behavioural strategies: a decision-balance sheet, attentional focus, enlisting social support, goal setting, imagery, positive thinking, self-monitoring, stimulus control, tension control and time management; vicarious

experience refers to learning a behaviour through visualising or watching others perform successfully. This can be developed through the use of the following examples of self-regulatory cognitive and behavioural skills: attentional focus, enlisting social support, imagery, positive thinking and tension control; verbal and social persuasion refers to oral feedback from significant others or by using positive self-talk. This can be developed through the use of the following examples of self-regulatory cognitive and behavioural skills: attentional focus, enlisting social support, goal setting, imagery, positive thinking, self-monitoring and tension control; and control of emotional and physiological states refers to an awareness and management of internal body states. This can be developed through the use of the following examples of self-regulatory cognitive and behavioural skills: attentional focus, goal-setting, imagery, positive thinking, self-monitoring and tension control.

A review of the literature reveals few studies that have focused specifically on evaluating worksite health education programs that are intended to develop exercise self-efficacy and increase participation in regular exercise. A number of related studies in other settings, however, provide some direction to assess developments in this field. Table 4 represents a summary of studies following the same index searches as Tables 1-3 and a personal library search of relevant publications pertaining to evaluations of intervention programs directed at increasing self-efficacy.

Table 4. **Self-Efficacy: Self-Regulatory Cognitive and Behavioural Intervention Strategies**

Author, Date	Subjects/ Sample Size/ Context	Program Format / Physical Activity	Intervention Strategies	Design	Outcomes
Allegrante et al. (1993)	92 male and female adult osteoarthritis patients	Walking and education program, 3 X 1.5 hour sessions per week X 8 weeks	Self-efficacy, relapse prevention training, behavioural contracting	Experimental	Increase in walking distance and frequency, decrease in pain and medication use
Jemmot and Jemmot (1992)	109 single black women	Self-management of condom-use, 3 sessions X 1.5 hours	Imagery, modelling, social support, communication skills, goal setting	Pre-experimental	Increase in self-efficacy and perceived partner support
Lorig and Gonzalez (1992)	597 adult arthritis patients	Self-management of arthritis and physical activity	Imagery, planning, tension control, verbal persuasion	Experimental	Increase in self-efficacy and health status
McAuley and Courneya (1995)	114 middle-aged males and females	Walking program, 20 weeks	Developing self-efficacy	Experimental	Increase in attendance, duration of physical activity and walking distance
Rose (1992)	155 elderly male and female	Peer-education program to reduce CHD and increase SE, 2 sessions per week X 1 month and 2 follow-up sessions	Imagery, modelling, self-talk, tension control, goal setting	Quasi-experimental	Increase in CHD knowledge, increase in dietary and exercise self-efficacy

Lorig and Gonzalez (1992) compared 500 subjects in a general arthritis self-help program to 97 subjects in a program designed on the principles of developing self-

efficacy. They found that the self-efficacy program showed a greater increase in health status and self-efficacy. Lorig and Gonzalez noted, however, that there was no evidence to suggest direct causality, hence the interaction of other mechanisms may be involved to change both factors or that a change in health status may affect self-efficacy. They called for more interventions to integrate theory with practice. Allegrante, Kovar, MacKenzie, Peterson and Gutlin (1993) studied a hospital-based patient education program, based on the Precede-Proceed Model, designed to enhance the functional capacity of patients with osteoarthritis of the knee. The program consisted of an 8-week walking and education program that focused on developing exercise self-efficacy. Forty-five subjects entered a control group while forty-seven subjects received the intervention program. The results indicated that the intervention group increased exercise self-efficacy and showed clinically meaningful improvements in functional status that were significantly greater than the control group.

Research has made a significant contribution thus far toward the assessment of self-efficacy based health education programs that are intended to increase and maintain health behaviour. The limitations of outcome-based research of this nature, however, in the absence of field-based randomised factorial design studies, are that they do not inform us as to why particular self-regulatory strategies within the program are more effective than others during post-program implementation, neither is it clear how particular strategies

are applied in the context of local implementation.
Furthermore, the context of worksite health education programs
with 20-30 participants requires the consideration of more
rigorous planning, teaching and learning frameworks than do
those studies cited regarding individualised patient education
programs.

Self-regulation of exercise behaviour: A summary and critical analysis

Tables 1-4 represent a summary of 23 studies following
index searches pertaining to evaluations of exercise behaviour
change interventions using Medline, Psych Abstracts, ERIC, and
CD Rom (Sportsdiscus), and a personal library search of
relevant publications. The review is limited to studies
employing approaches from the traditions of psychological
behaviour modification in clinical, community and workplace
settings. Studies are classified by intervention type and
listed alphabetically.

Subjects and context

Studies have used different sample sizes (e.g., n = 7 -
24, 603), diverse subjects (e.g., males and/or females,
university students, children, patients, employees and fitness
class participants) and have been conducted in a variety of
settings. From an experimentalist perspective, this
inconsistency has not aided the generalizability of these
findings and thus presents equivocal guidelines for increasing
exercise adherence. It could be argued, however, that

extensive positive outcome data across a variety of settings does add considerable support for the efficacy of exercise behaviour interventions. Caution is warranted, however, in the interpretation of these data since the findings are not conclusive due to methodological concerns reported with all of the studies cited.

<u>Physical activity and duration</u>

The type of physical activity varied from study to study (e.g., exercise class, walking programs, stairclimbing). Only two studies (Jarvie & Thompson, 1985; Juneau, 1987) reported evaluating unsupervised aerobic exercise programs (e.g., home-based walking, jogging), the remainder focused on supervised programs typically in exercise classes or fitness programs. Research by Stephens, Jacobs and White (1985), found that people prefer (particularly among those who are initially unfit) moderate intensity activities (e.g., brisk walking) and those they can perform individually, as opposed to more vigorous activities or a fitness regime in a structured setting. This was supported by the Canadian Fitness and Lifestyle Research Institute (1990), who found that the majority of Canadians indicated that their main involvement in physical activity for fitness was through totally unstructured activities such as walking, gardening, swimming and cycling.

Green and Ottoson (1994) reported in their survey of the literature that increasing physical fitness through a 30-60 minute daily walk may reduce an unfit man's and an unfit woman's risk of early death by 37% and 50% respectively. It

would appear, therefore, that promoting brisk walking has considerable advantages to sustaining an individual's participation in regular exercise. It is important to note, however, that people's needs and preferences do differ and change over time, thus promoting a range of aerobic activities that present minimal barriers to participation (e.g., unsupervised cycling, jogging, swimming) is likely to appeal to a range of people in health education programs over a long period of time.

Intervention strategies

A critique of intervention strategies has been addressed earlier in the literature review for specific classifications of intervention. Essentially, studies showed an inconsistent use of specific intervention strategies, rather, a variety of strategies were employed. Furthermore, multi-component intervention programs have been evaluated as a single comprehensive program. Consequently, the literature is not yet clear as to which self-regulatory cognitive and behavioural skills are best for specific people in particular settings and how specific strategies are applied in the context of local implementation. It would appear, however, that a range of self-regulatory cognitive and behavioural skills developed for people in different stages of exercise behaviour will increase self-efficacy and therefore enhance the participation in regular exercise.

Design

Studies were categorised using Campbell and Stanley's (1963) classifications of experimental design. <u>Experimental designs</u> provide optimal internal and external validity. Random assignment of participants to groups and randomised groups to treatments are characteristic of this type of design. These designs include pre-posttest control group designs, Solomon four-group designs and post-test only control group designs. <u>Quasi-experimental designs</u> include time series designs and are characterised by non-equivalent control groups. <u>Pre-experimental designs</u> include pre-and post-test designs with no control or comparison groups against which to gauge the changes in the treatment group.

Of the studies cited, thirteen studies involved experimental designs, seven studies involved quasi-experimental designs and three studies involved pre-experimental designs. Despite the rigorous superiority of experimental designs, no single intervention emerged as a better strategy. Specific limitations and methodological concerns, however, were reported within each type of intervention classification. Quasi-experimental designs enable research to be conducted in the field context and therefore have more appeal to practitioners. The absence of randomising subjects to groups however, requires caution in interpreting outcomes from these studies. Pre-experimental designs that use pre- and post-test data are favoured in unique settings where it is not possible to include sufficient subjects in studies

for a control or a no-treatment control group. Research of this nature lends itself to focusing program evaluation from alternative epistemological perspectives, in which controlling for internal and external validity are not considered criteria for quality research.

<u>Outcomes</u>

Despite the number of studies that have investigated exercise behaviour change, there is little agreement in the literature with respect to a consistent definition of exercise adherence. This has resulted in multiple indirect and direct measures of exercise adherence including self-reported exercise behaviour, physiological monitoring, self-reported exercise behaviour change and self-efficacy, maximum oxygen uptake, exercise frequency, exercise duration, points accumulation and attendance at exercise classes. In spite of acknowledged limitations in self-report data, few studies attempted to triangulate data collection from multiple perspectives. Evidently, the measures of exercise behaviour need to be standardised before the literature can claim with any replication that behaviour change strategies do affect exercise behaviour for diverse people in a variety of settings.

Studies have tended to focus on health outcomes for evaluating behaviour change interventions, yet many of the studies were of less than a 12-week duration. According to the American College of Sports Medicine (1990), reliable fitness changes require substantial increases in exercise intensity

for periods of 8-20 weeks or longer times at lower intensities of exercise. Furthermore, the reliability of behaviour change interventions would be enhanced if studies were repeated using the same subjects in the same environmental setting. Clearly, this presents a major challenge to researchers since this is practically impossible to implement in field settings. The complexity and transient nature of people's needs and circumstances rarely match those of an experimental research agenda.

With the exception of one study (Marcus & Stanton, 1993), all studies reported increases in measures of exercise adherence. It is possible, however, that so many positive outcomes reported from studies conducted in a variety of settings with diverse subjects may be susceptible to the Hawthorne effect (attention from a health professional rather than the actual influence of a specific intervention). Studies employing experimental design methods have not been able to adequately control for this effect. Scriven (1993), however, called for more attention to integrate personnel evaluation into program evaluation as this is a key factor in program outcomes. He suggested that good program evaluation should uncover and correctly report poor management and great creative talent in some aspect of the program.

Conclusion

This review analyses the potential of psychological-based behaviour change interventions to increase and maintain regular exercise. Specifically, the review traces the historic

development of psychological based interventions from pre-
Social Learning Theory to Bandura's (1986) Self-Efficacy
Theory and self-regulation for exercise behaviour change.
Alternative theoretical frameworks have emerged in the
psychological literature. Relapse prevention training (Marlatt
& Gordon, 1985), for example, received widespread application
during the 1980's in preventing relapse from undesired health
related behaviours. This framework, however, has been less
successful for exercise behaviour change possibly because
exercise behaviour is a desired behaviour typically requiring
more time and social support than other health related
behaviours. The Theory of Planed Behaviour (TPB), which
superseded the Theory of Reasoned Action (TRA), has emerged in
the literature with intuitive appeal. Essentially, this
framework has combined TRA, the stages of behaviour change and
self-efficacy in an attempt to gain incremental explanation
for exercise behaviour. Bandura (1995), however, is very
critical of the TPB, describing it as "cafeteria style
theorising" at the expense of theoretical coherency. Bandura
argued that the number of variables inherent in the TPB not
only presents a methodological barrier for field research
questionnaires but also raises more questions than provides
guidance for understanding health behaviour change.
Furthermore, he argued that the arbitrary stages of behaviour
change do not capture transformational or qualitative changes
inherent in a stage theory. Thus more research is required on
TPB before its widespread application for exercise behaviour

change. Despite the criticisms aimed at the stages of behaviour change, it presently provides a popular tool in the field, which, when used in conjunction with other instruments provides useful feedback in which to assess the efficacy of health promotion programs.

A review of empirical studies suggests that self-regulatory cognitive and behavioural intervention strategies enhance exercise behaviour change. Inadequacies in methodological approaches to evaluating exercise behaviour change interventions, however, cast some doubt on the effectiveness and generalizability of specific behaviour change interventions. There is a need, therefore, for more stringent research methodology combined with a willingness to embrace epistemological perspectives from alternative paradigms. This is more likely to provide a greater insight to the process and outcomes of exercise behaviour change interventions. Future research would thus benefit by evaluating self-efficacy based health education programs in worksite settings with moderately large groups of employees, and focusing on factors and processes in the context of post-educational application.

To conclude, the literature suggests, in spite of methodological limitations, that developing self-regulatory skills and enhancing knowledge about the outcome benefits of participating in regular exercise, will increase self-efficacy and, therefore, reduce the difficulty that people experience in adhering to regular exercise. This approach thus provides a

foundation for the core development of the proposed worksite Lifestyle Skills Motivation program (see Appendix A). It is important to note, however, that self-efficacy approaches centre the control for an exercise behaviour change on the individual, with particular emphasis on changes in predisposing factors. Contemporary adult learning theory from a sociological perspective, in contrast, situates the individual in a broad social context. From this perspective, multiple factors in the social environment are thought to affect the subjective values placed on an expected outcome and one's belief to overcome barriers, and are likely, therefore, to enable or reinforce a behavioural change. Rudman (1986), for example, claimed that one's personal circumstances and socialising experiences are likely to play an important role in determining how active one would tend to be over the life course. Thus assisting people to overcome barriers to exercise (enabling), as well as providing physical and social supports (reinforcing) is likely the best way to assist those people who intended to do more exercise (Boothe, Macaskill, Owen, Oldenburg, Marcus, & Bauman, 1993). It would appear, therefore, that in combination with other broader perspectives of behaviour change, self-efficacy and the stages of exercise behaviour change offer direction for reconceptualising the planning and assessment of worksite health education programs.

(b) EDUCATIONAL APPROACHES TO BEHAVIOUR CHANGE

Educational perspectives, in particular, adult learning theory have contributed to our understanding of the nature of adult learning for behaviour change. Contemporary adult learning theory, from a sociological perspective, provides an alternative way of viewing and thinking about this process. Essentially, a sociological perspective of adult learning situates individuals in a social, historical, geographical, political, economic and cultural context and, therefore, these factors are key to adult learning for behaviour change. Contemporary adult learning theory provides guidance for broad intervention strategies in a worksite health promotion program to affect change in exercise behaviour.

Adult learning theory

There is currently a lack of evidence to support adult learning as significantly different from pre-adult learning. Mezirow's (1990) perspective transformation, however, requires learners to become critically aware of how and why they attach the meanings the way they do to reality. Individual development is both a social and psychological phenomenon (Tennant, 1993). This level of maturity and experience is typical of adulthood. Similarly, contemporary views of self-directed learning require a level of autonomy coupled with sophisticated critical reflection that is also commensurate with the specific characteristics of adulthood. A growing number of adult learning theories (andragogy, self-directed

learning and perspective transformation), therefore have suggested that the defining characteristics of adult learning are the qualitative differences between the adult learner and the child learner, and between the context of adulthood and the context of childhood.

No single theory or perspective of learning is adequate to explain this process, but rather, a variety of theories have evolved in the literature that place a different emphasis on one or more of the following factors: the learner characteristics, the process of learning and the influence of context on learning. Early adult learning theory originated from a psychological perspective, specifically the behaviourist tradition. For example, Thorndike, Bregman, Tilton and Woodyard (1928) conducted laboratory research that focused on the relationship between age and learning behaviour. They constructed a learning curve to show how the rate of learning, often determined by a specific test-taking performance was found to decline with age. Merriam and Caffarella (1991), however, have since shown that declines in the rate of learning are functions of non-cognitive factors (e.g., specific training, level of education, health and speed of response). Behaviourist research gave way in the seventies to a humanistic perspective of adult learning (Knowles, 1975). This placed an emphasis on the characteristics of adult learners and on formulating an adult-specific "theory" of learning that focused on self-directed learning. The following review outlines the development of self-directed learning from

Knowles' (1970) concept of andragogy to broader social contextual perspectives of critical self-directed learning. Critical self-directed learning provides the framework for the teaching and learning processes of the worksite health education program.

Self-directed learning and adult education

Knowles (1970, 1975, 1980) has been credited by many adult educators with the origin and widespread practice of "andragogy". Knowles (1970) described andragogy as the art and science of helping adults to learn and suggested that self-directed learning should be the beacon to focus all adult learners. He defined self-directed learning as, "a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (p.18). In contrast, he initially referred to "pedagogy" as the art and science of helping children to learn through a teacher-centred approach.

In criticism, Elias (1979) countered that andragogy was simply a smoke screen for attempting to justify a separate field of adult education. He suggested that this concept was no more than "progressive education", a term used throughout education to describe a shifting trend away from teacher-centred learning. Others in the literature were less concerned with Knowles' claim for an adult-specific theory, but rather,

andragogy's implied exclusive reliance on learner-centred education. It was argued that there are circumstances when teacher-centred adult learning is appropriate, particularly during the introduction and early phases of a learning project. In these circumstances some learners may have limited prior experience in the subject area to draw upon. Thus, during this period a teacher-centred approach would enhance the acquisition of the basic knowledge and skills to help those learners become more self-directed in the future.

The attention that andragogy received and the concerns that were raised in the literature regarding the exclusivity of andragogy to adults and the comprehensiveness of this theory, caused Knowles (1975) to modify his position. He declared, instead, that andragogy was a technique that existed at one end of a learning continuum, with teacher-centred learning at the other. Knowles insisted that learning should be actively constructed by the learner. Some learners, however, may not always prefer to be "active" participants in the physical sense of the learning process (discussion, practical, role play) all of the time. A strong case can be argued for the merit and value of learning from observation and reflecting on information or an event in certain circumstances.

Self-directed learning has been described as a complex, rugged, haphazard, and non-linear endeavour that varies from person to person and according to the learning experience. Knowles (1980) found that adults move toward self-

directedness at differing rates and not necessarily in all dimensions of life. Grow (1991) suggested that self-directed learning follows four progressive stages (dependant, interested, involved and self-directed) with multiple cognitive processes used throughout each stage in a learning endeavour. This model was influenced by Vygotsky's concept (1978) of the "zone of proximal development" - the degree of change that stimulates learning (Grow, 1994).

Knowles (1984) developed seven guiding principles for learners and teachers to facilitate self-directed learning: climate setting, mutual planning, assisting participants in diagnosing their needs, supporting learners in formulating their learning objectives, helping learners to develop learning plans, assisting learners to carry out their plans, and involving learners in evaluating their learning. Central to the process of self-directed learning is learner-centred control. This implies that learners participate in the control over the variables associated with the learning project. That is, they are given the opportunity to choose what they want to learn, how they want to learn it and how they want learning to be evaluated. Furthermore, Brookfield (1995) argued that learner-centred control that is truly self-directional must include access to the resources needed to act on reflectively informed decisions. Potentially, this presents a major challenge to adult educators. Pratt (1988) noted however, that learner control can come in many different forms, from wanting the instructor to provide more support and structure, to

learners being highly capable of providing their own structure and support. Self-directed learning, therefore, can operate with various degrees of autonomy.

Andragogy clearly focuses on choice and a collaborative caring relationship between the facilitator and the learner. Tennant (1986) cautioned that the preoccupation with maintaining a pleasant relationship with the learner may prevent the level of critical discussion that can facilitate learning. The widespread practice of andragogy is clear testimony, however, that for many adult educators, it is seen as the hallmark of contemporary adult education. Brookfield (1993) noted that self-directed learning is now comfortably ensconced in the citadel, firmly part of the conceptual and practical mainstream. This essentially humanistic psychological approach to adult learning, however, has aroused a number of concerns.

Andragogy is seen to develop the following characteristics: independence, an ability to make choices, an ability to formulate goals and plans, the self-motivation to overcome barriers, and a strong sense of personal values and beliefs. The values underlying these assumptions about adult learning include: self-reliance, self-improvement, self-restraint, self-fulfilment, self-discipline, self-actualisation and, what Pratt (1993) referred to as an "entrepreneurial democracy". Pratt (1993) suggested that the intuitive appeal and widespread attention that andragogy has received among many adult educators has occurred because it

speaks the language and epistemological beliefs of affluent white middle class Americans regarding the purpose of adult education. Clearly, this raises the question of the appropriateness of the universal and widespread practice of andragogy for adult learners in a pluralistic and heterogeneous society.

The humanistic values inherent in andragogy clearly focus the role of adult learning on the "self" and on personal development. According to Grow (1994), the concept of an isolated "self" that is "self-directing" leaves out technological, political, cultural, biological, spiritual and other interconnections that should be core concerns in education. A psychological perspective of adult learning assumes that learning occurs in isolation from the world in which the learner lives and, therefore, tends to ignore the vast influence of the hierarchical and structured context of reality on adult learning. An emphasis on the individual can lead to "victim blaming" rather than a critical reflection and consideration of contextual structures. Candy (1991) asserted that the context of the learning environment was a key determinant of autonomous behaviour. Psychological approaches also downplay the social influence on learning. Sternberg (1990) noted that even wisdom, considered by many, to be the pinnacle of cognitive development, is experientially defined and culturally bound. Family, friends, colleagues and the community, therefore, all provide experiences and information that contribute to a learner's understanding of the world. In

many situations, adult learners prefer to compare and discuss their ideas and understanding of topics with others. Thus, an individual does not simply construct meaning in a vacuum, but rather, learning is an individual and social contextual process.

Law and Rubenson (1988) called for a re-orientation of adult education away from psychological and developmental foundations and instead, towards a sociological perspective that would "rehumanise" adult education to the context of society rather than on the individual. A sociological perspective takes into account the social, political, economic, cultural and historical context that influences adult learning. From this perspective, issues of power become more central to learning, rendering naive, if not redundant, the language of psychologically focused self-direction (Law & Rubenson, 1988). In recent years, not surprisingly therefore, adult learning theories have been formulated by drawing on the work from other disciplines and perspectives (sociology, critical theory and anthropology). These perspectives take a broader focus on the social and experiential context of learning.

Critical theory and adult learning for behaviour change

Critical theory challenges educators to think broadly and more critically about learning for behaviour change. According to Bernstein (1976), critical theory aspires to bring people to full consciousness of the contradictions implicit in their material existence, to penetrate the ideological

mystifications and forms of false consciousness that distort the meaning of social existence. Critical theory developed historically along a path from Marxism, to critical thinkers and scholars (Adorno, Marcuse) from the Frankfurt School in Germany and presently to contemporary approaches as are evident in the work of Habermas (e.g., 1972, 1984, 1987). Contemporary approaches to critical theory have embraced the Marxist notion that to explain and understand the world is not enough, but one must try to change it for the better. Critical theory, therefore, does not claim to be value-free or divorced from action (Habermas, 1972).

Habermas (1984, 1987) asserted that communication and information are defined and dominated by an elitist minority and in turn, shape a consumer-based society. He claimed that distorted communication of this nature focuses western thought (e.g., pertaining to exercise behaviour change) on instrumental rationality (individualism, personal development, material gain or profit). To counteract this, he developed a theory of communicative interaction in which a society is, instead, seen as a community of social action and interaction. There are two central concepts to Habermas' theory: communicative rationality and communicative action.

Habermas postulated that people essentially engage in social interaction (e.g., adult education) for reasons to construct meaning ("communicative rationality"). Implicit in one's ability to communicate is a belief that an agreement or understanding can be reached based on the merits of differing

points of view. Habermas asserted, however, that an agreement

or understanding can only be truly achieved in non-coercive,

non-manipulative and open communication. Under these

conditions, unlike "instrumental rationality", all parties

have an equal opportunity to speak and to select the optimal

course of action which ensures that knowledge is validated

universally. Clearly, in reality, communication of this nature

is rarely achieved. Habermas believed, however, that

individuals do have the ability to think critically, which is

key to affect behaviour change. After all, he noted, everyday

consumer-based social exchanges in western society necessitate

critical thinking skills for one to consider the

comprehensibility, sincerity, appropriateness and truthfulness

of the communicative information before one acts on it. He

postulated that a learner has the potential to acquire three

types of knowledge: technical, practical and emancipatory to

become a reflective thinker. Habermas thus, called for greater

critical reflection on how we make meaning in the way that we

do (e.g., for exercise behaviour change) in order to enhance a

communicative rationality. Supporting this view, Pietrykowski

(1996) cautioned adult educators not to lose sight of the

connection between knowledge and power. She urged adult

educators to, "help identify the multiple sources of power

that are linked to knowledge construction, suggest alternative

meanings and help develop critical competencies oriented at

diverse micro-technologies of power" (p.95).

Habermas' other main concept was "communicative action". In relation to exercise behaviour change, this views people as finite objects that can think, feel, speak and act collectively for a better world. In contrast, he argued that "instrumental action" views nature and people as discrete objects that are expendable and which can be manipulated. For example, science and technology both dominate in mass communications to promote specialised exercise behaviour over public health messages for active living. Critical theorists point out that preoccupation with technological domination (e.g., exclusive fitness equipment and facilities) fosters individualism and disconnects the means of production (e.g., habitual exercise behaviour) from human needs. Consequently, natural resources become unregulated commodities, people in low socio-economic groups are often exploited to buy exercise products and relatively few people have access to education and health facilities. In contrast, therefore, the concept of communicative action is based on the principles of collaboration, involvement, co-operation and community empowerment for behaviour change.

Habermas provided a powerful means of understanding the unity in the diversity of the human condition. Further, he developed a way of thinking critically about this process in a broader social context. For example, in worksite health education, critical reflection of structural and power relations can help clarify the reasons for a behaviour change and encourages one to consider multiple social and other

contextual factors that shape his or her participation in exercise behaviour.

Wallerstein and Bernstein (1988) proposed an empowerment model for effective health education that promoted health individually as well as collectively. They defined empowerment as a social action process that promotes participation of people, organisations, and communities in gaining control over their lives in their community and larger society. In other words, focusing on collective power to effect change. This perspective of empowerment has a dual focus on participatory reflection and action, therefore, taking health promotion beyond simply focusing on improving self-efficacy and self-development, toward an emphasis on prevention, community connectedness, improved quality of life and social justice.

A Critical theory for adult learning about exercise behaviour change, therefore, does not take the social world as a given. From a critical perspective, oppressive social, economic, political, cultural and historical images, myths and structures (access, opportunity, choice, power, customs, socialisation, etc.) are revealed that discriminate and prevent individuals from reaching their true potential. Critical theorists postulate that people have the capacity to be reflective thinkers and to act contrary to distorted communications. They also strive to find ways to empower people individually and collectively to change and liberate society (Freire, 1970; Habermas, 1972).

An inherent problem with critical theory, however, is the implied belief that one can separate oneself from the historical and cultural context to analyse distorted communication and false consciousness. The challenge thus remains for critical theorists to define clearly the normative boundaries of critical theory. Cervero and Wilson (1994), noted that, critical theory should not function as a doctrine, it can only remind us of what we care about and how to embody those cares into educational practices to enhance change. Critical theory thus centres adult learning on experiences that play a progressive role in creating a more equal and humane society. Essentially, it develops a social consciousness, specifically a critical awareness of the context, which in part influences adult learning and behaviour change.

Critical self-directed learning

Knowles' andragogical perspective of self-directed learning has recently been revised and developed to include a more integrative and explanatory view of adult learning (Brookfield, 1993; Garrison, 1992; Grow, 1994; Hammond & Collins, 1991). In particular, this can be seen from the amalgamation of Knowles' andragogy with critical theory by embracing the concepts of both learner-centred control and a critical analysis of responsibility. Learner-centred control thus becomes coupled with interdependence and

interconnectedness as necessary attributes of critical self-directed learners in society (Boucouvalas, 1988).

Critical analysis of responsibility encourages the learner to go beyond rigorous and creative application of individual motivation strategies toward thinking about how commonly-held assumptions, institutions, social structures and the conditions of people's lives may prevent them from developing individually and collectively for behaviour change. Caffarella (1993) noted that challenging such assumptions can help adult learners better understand and respond to the context that shapes, at least in part, what and how they learn. Many people in routine households or workplace settings, for example, have very little opportunity to be sufficiently physically active (as recommended by the guidelines from the American College of Sports Medicine, 1990) in order to attain the benefits of regular exercise. For these learners in worksite health education, social support and critical reflection can be liberating experiences to acknowledge structural barriers and thus focus their efforts on structural changes, especially for those learners who have otherwise felt the inadequacy of psychological strategies to overcome personal barriers to exercise. Thus, critical self-directed learning can be interpreted, in part, as an inherently political idea by examining control, the conditions required to access resources and an alertness to the possibility of hegemonic forces (Brookfield, 1993).

Most reflection in adult education takes place within the context of problem-solving and discussion (Freire, 1970; Mezirow, 1994). Brookfield (1993) noted that critical reflection can be a lengthy, tiring and often contentious process. Although critical thinking is not a new concept to the adult education literature, it is, however, a complex and multifaceted process that is represented through the lenses of multiple perspectives (critical theory, constructivism, positivism, post-modernism). Central to various perspectives of critical thinking is an evaluation of claims, objects, processes and/or outcomes. Each perspective contributes to our broad understandings of critical thinking though each has particular implications for curriculum and instruction (Wright 1992, 1995). For the purpose of this study, an eclectic approach is taken that embraces multiple perspectives of critical thinking. Critical thinking is thus considered an individual and social contextual process. Critical thinking is, therefore, defined as rigorous, creative and critically reflective thoughts pertaining to the problem under consideration (e.g., exercise behaviour change).

Critical self-directed learning, not only compliments principles embedded in self-efficacy for individual behaviour change, but it also provides broad sociological intervention strategies for collective exercise behaviour change. Concepts of critical analysis of responsibility and social action provide guidance for changes in enabling, reinforcing and environmental strategies for exercise behaviour change.

Critical self-directed learning can be operationalised in worksite health education through problem-solving activities that focus on application as an individual and social contextual process. This process focuses on depth and breadth of critical thinking and self-directed learning strategies regarding the macro (societal), meso (workplace) and micro (immediate application) environments. Role playing, case study problem solving exercises and small and large group discussion with respect to alternative perspectives, ideals, personal experiences, myths and underlying assumptions are examples of authentic activities that can be implemented to achieve these outcomes. Essentially, this perspective assumes learners bring to the learning situation diverse experiences and a variety of experiential bases: they are at various stages of learning, they learn at different rates and they learn in multiple ways. Essentially, adult learning for exercise behaviour change is viewed as an individual and social contextual process. Knowles (1975) asserted that adult learning that is meaningful is associated with the everyday problems of adults in their social world. Worksite health education is thus seen as a co-operative venture to empower learners toward individual and collective exercise behaviour change.

According to Merriam (1993), the lifelong ability and willingness to be self-directed is critical to survival and prosperity in a world of continuous personal, community and societal changes. This belief is consistent with contemporary views of health promotion. A broad view of self-directed

learning that takes into account the interconnectedness of high levels of autonomy, critical reflection of social and other contextual factors is, therefore, central to the design of the worksite health promotion program. Merriam cautioned that a singular perspective of adult learning should not be idealised as the only guiding beacon for adult learning. A pluralistic and eclectic approach to adult learning is necessary to prevent the hegemony of universally representing the interests and values of a dominant group.

Adult learning is thus presented as a dynamic and complex phenomenon. Multiple perspectives of adult learning inform us that facilitating this process is not value-free. Pratt (1993) noted that, the philosophical, theoretical and empirical claims to truth regarding the characteristics of adults as learners and the means to facilitate adult learning are dependant on the concept of learning.

Conclusion

Contemporary educational approaches to adult learning for behaviour change increasingly draw on sociological perspectives to understand learning in diverse settings. This approach takes a broad perspective of human behaviour and assumes that the underlying order and pattern of adult learning is socially, rather than individually determined, as evident from psychological perspectives. Sociological approaches, too, however, have their limitations. Criticism aimed at this approach focuses on the lack of specific guidelines for intervention strategies, the implicit

powerlessness of the individual to control change and the lack of empirical evidence to support such claims of the complexity of human behaviour. Furthermore, the complexity, breadth and depth of analysis that is offered by sociological approaches does not lend itself to the manipulation of independent variables. Neither does it allow for the randomisation of subjects to specific groups that are typical of psycho-experimental approaches to behaviour change. An eclectic approach, therefore, combining psychosocial perspectives to behaviour change, provides a more complete understanding of this process. This perspective is consistent with significant advances that have occurred recently in contemporary adult learning theory by integrating humanistic psychological theories of learning with broader sociological theories of learning that resulted in critical self-directed learning.

Program content framework

Rather than attempting to shape individuals' behaviour by external means, programs designed to enhance maintenance of participation should be tailored to individuals' needs, helping them to recognise and implement strategies that prevent relapse (Lovato & Green, 1990). Burdine and McLeroy (1992) cautioned that no single theory is adequate to tie together the multiple levels of influence and to identify potential points of intervention for health education programs. Thus, with the literature considered, a worksite health promotion program was developed by the researcher that

combined the literature in exercise psychology and adult
education.

The worksite Lifestyle Skills Motivation program was
intended to empower participants individually and collectively
with the knowledge, attitudes and specific skills to
critically self-direct regular health related exercise (brisk
walking, jogging, cycling, swimming, exercise-bicycle or
stairmaster). The program focused on a broad and critical
perspective for developing self-efficacy to enhance individual
and collective exercise behaviour change. The question arises
as to which self-regulatory skills should be incorporated in a
health education program and how these skills should be
sequenced and integrated with broader intervention strategies
from contemporary perspectives of adult learning theory. As
the literature revealed, there is no best combination for all
persons, groups or situations. Therefore, an eclectic approach
was taken that embraced concepts and intervention strategies
drawn from a variety of behaviour change models, particularly,
Self-Efficacy Theory and critical self-directed learning. This
approach acknowledges exercise behaviour change as an
individual and social contextual process.

Sinclair and Sinclair (1994) suggested that effective
mental management of one's physical performance requires the
ability to set realistic long and short-term goals with clear
daily practice objectives. Attention must be focused
specifically on relevant cues, and when this attention control
starts to drift, it must be refocused. The appropriate level

of arousal for one's ideal performing state must be learned
and regulated. In addition, one must develop thought control
skills that provide support for a positive and enabling self
image. Boutcher and Rotella's (1987) psychological skills
program is typical of mental skills programs to increase self-
efficacy through the development of self-regulatory
strategies. They suggested the following key ingredients of
their four-phase program: analyse the nature of the task
(e.g., the physiological and psychological benefits of
exercise, knowledge about the components of physical fitness,
the issue of exercise adherence, and the role of self-
regulatory cognitive-behavioural skills); individual
assessment (e.g., profiling using questionnaires, and self-
monitoring of an activity diary, exercise self-efficacy,
recovery heart rate); motivational phase (e.g., goal setting,
time management, exercise game plan); and the mental skill
development phase (e.g., mental preparation, attention focus,
imagery, tension control and building exercise confidence).

Fullan (1991) presented a framework for educational
programs to help teachers empower learners toward post-
educational implementation. This model guides teachers to
attend to the combination of six main themes: vision building,
evolutionary planning, initiative-taking and empowerment,
resource and assistance mobilisation, problem-coping, and
restructuring. Fullan pointed out that educational change
induces the transformation of subjective realities by learning
new ways of thinking and doing, new skills, knowledge,

attitudes and beliefs. He warned, however, that when change is interpreted in an oversimplified way and neglects these aspects it can lead to an erroneous perception of change (false clarity).

Rick Hansen's innovative Life Skills Motivation program identifies six fundamental skills as essential to health career and personal development: self-awareness, accessing and utilizing information, communicating with and relating to others, goal setting and planning effectively, initiating and managing change, and decision making and problem solving.

Drawing on several frameworks and a review of the literature, therefore, the worksite Lifestyle Skills Motivation program combined and adapted psychological approaches and contemporary adult educational perspectives to incorporate individual, social and other contextual intervention strategies (Garrison, 1992; Hammond & Collins, 1991) throughout the duration of an eight-session program.

The program began by establishing a comfortable learning environment that fostered interaction, critical thinking and collaborative problem solving. Multiple factors that influence one's involvement in exercise participation, together with a variety of outcome benefits following the participation in regular exercise were presented and discussed. During each session, opportunities were provided for individual, partner, small and large group discussion that encouraged critical reflection of contextual factors that were likely to hinder or facilitate participation in regular exercise. Thus each

session allowed individuals a valuable opportunity to share and draw from personal experience and provide input regarding authentic barriers that could prevent the participation in regular exercise. In addition to psychological based intervention strategies, therefore, a key component of the worksite Lifestyle Skills Motivation program focused on mobilising the workplace community toward collective exercise behaviour change. By the end of the program, representatives were elected to co-ordinate wellness activities in the workplace context.

Cognitive and behavioural motivation strategies were presented as part of on-going application activities for exercise behaviour change. Initial sessions began with the introduction of behavioural strategies (e.g., goal setting and self-monitoring) before progressing to cognitive strategies which completed the self-regulation of exercise behaviour. A pre-requisite for the effective use of cognitive strategies is the ability to control tension levels (Albinson & Bull, 1988). Thus, tension control preceded the imagery component. Imagery provided the foundation for both focusing skills and positive thinking strategies, therefore, this component was suitably scheduled prior to these other two components. The session related to positive thinking brought together Bandura's (1986) components for developing self-efficacy and therefore was appropriately situated at the end of the program. Each session focused on the application of key motivational strategies for exercise behaviour change. The final session re-visited all

strategies and their potential application to overcome exercise barriers. The program was drawn to a close with the application and formulation of a personal exercise game-plan that took into account individual, social and other contextual strategies for post-educational application.

To conclude, an eclectic approach was taken to develop the worksite Lifestyle Skills Motivation program by combining psychosocial concepts and intervention strategies to enhance critical self-directed application of exercise behaviour change. A detailed instructional manual was developed by the researcher which contained guidelines for teaching critical self-directed learning, examples of overheads, worksheets, questionnaires, self-monitoring tasks, problem solving activities, learning outcomes for each session, and a formative and summative program evaluation form. The core structure of the program involved eight, one-hour sessions over a four week period (see Appendix A). The format for each session included a review of the previous session; an introduction to a motivational skill; small group interaction with an emphasis on critical thinking, problem solving and skill application; a summary; and finally, an individualised, take-home, practical assignment. Program support activities and sessions continued to be available for the program participants on completion of the formal four-week program. This Lifestyle Skills Motivation program has shown evidence of success in pilot programs that have been implemented in a community, a university and a corporate workplace setting.

PROGRAM DEVELOPMENT (PART II)

Worksite health promotion: Program implementation

The literature from implementation, worksite health promotion, program planning, adult teaching and program evaluation was examined to provide guidance for implementing the Lifestyle Skills Motivation program in a workplace setting.

Implementation

Implementation theory offers unique insight into the role of the social system and the nature of change in the implementation of new programs and practices. This theory takes a broad and long perspective to understanding behavioural change and offers considerable guidance for the analysis of this process. Implementation is grounded in the political and social sciences and is represented in the literature from multiple perspectives: <u>Political</u> - e.g., community program intentions, communication networks and enforcement (Berman, 1978); <u>Organisational</u> - e.g., organisational systems and communication networks (Elmore, 1978); <u>Interpersonal</u> - e.g., an exchange between people with respect to knowledge, skills and evaluation (Weiss, 1980); and <u>Planned Change</u> - e.g., strategies to facilitate successful implementation (Fullan, 1991; Lippitt, 1973). Implementation is also embedded in a variety of related literature since it

is often assumed to be the same, or if not part of other change processes (e.g., application, diffusion, evaluation, knowledge Utilisation, planning and the transfer of learning). The literature, however, distinguishes between the nature of the variables that influence these change processes.

Different perspectives of implementation have generated several meanings in the literature to describe this process. According to Fullan (1991), implementation is the means of accomplishing desired objectives. For Berman (1978), it is a change process with identifiable political levers and social interaction. Marjone and Wildavsky (1979) viewed it as a struggle over the realisation of ideas and Wharf and Callahan (1984) described implementation as the process that brings about a behavioural change in the future. Ottoson and Green (1987) concluded from a review of definitions that had been ascribed to implementation, that "implementation is an iterative process in which ideas, expressed as policy, are transformed into behaviour, expressed as a social action"(p. 362).

The implementation literature recognises that program implementation is shaped by multiple factors (social, political, economic, organisational, cultural and individual) and involves multiple actors (policy makers, program managers, instructors, and clients) in complex settings. Very often, individuals who are involved in the change are not necessarily the same as those who conceived of the idea. Ottoson and Green (1987) suggested that "as part of a larger process of change,

implementation connects and responds to the ideals and intents of those who shaped it, and the needs and circumstances of those who are to benefit from it" (p.5).

Pressman and Wildavsky (1984) asserted that context plays an important role in shaping programs particularly during implementation. Social, political and cultural norms and factors in the workplace context that are likely to shape programs include the organisational structure, the union-management-employee politics with respect to program implementation, the loyal and rival opponents of the program and their concerns, employee and management commitments toward the program, available communication channels that existed in the department to disseminate programmatic information, degree to which the organisation was involved in health promotion programs, and the availability of a suitable venue and scheduling opportunities to conduct this program. These factors cannot be understood except through intensive involvement with that context.

Adaptation is clearly central between theory-driven intentions and behavioural and non-behavioural outcomes. For example, theoretical ideas are translated into program activities and program deliverers and/or teachers interact directly with the service needs of program participants and are unlikely to implement a program at the practice level in ways that strictly adhere to the goals of the program. Finally, program participants have to interact directly with their local environment and may not implement learning

activities at the practice level in ways that strictly adhere to classroom experiences. According to Marjone and Wildavsky (1979), faithful implementation is sometimes undesirable, impossible, and often unforeseeable since implementation depends on what people bring to it, as well as what it contains. Implementation, therefore, necessitates mutual adaptation between the concept and the context so that programs can be adapted to local situations and changing circumstances.

The complexity of implementation has contributed to a lack of agreement in the literature with respect to a specific conceptual framework for this process. Implementation has been approached as a top-down synthesis (Roberts-Gray, 1985) and a bottom-up synthesis (Green, 1986). In contrast, Green and Kreuter's (1991) Precede-Proceed model and Fullan's (1991) model of implementation proposed an interactive and on-going collaborative venture that integrates both top-down and bottom-up processes. Timing is crucial to the success of implementation. It requires an analysis of when, where, and who is responsible for implementation (Green & Ottoson, 1994). Nevertheless, the power to influence people, and the financial and economic resources required during program implementation are likely to have a significant effect on the outcome. It could be argued, however, that ultimate power to implement programs rests with the individual "doers" throughout the process from policy/idea to action.

Program implementation is clearly a long and complex process from original intent to final action. It has both a starting and an ending point though where planning and policy formulation end and implementation begins is virtually indefinable (Green & Kreuter, 1991). Implementation should not be considered simply in terms of a series of discrete steps or stages rather, it progresses in a dynamic, loose coupling and continuous cyclical process of planning, action and evaluation. Figure 2 conceptualises the broad process of program implementation in a workplace context.

SOCIAL MILIEU

PLANNING

TEACHING   EVALUATION
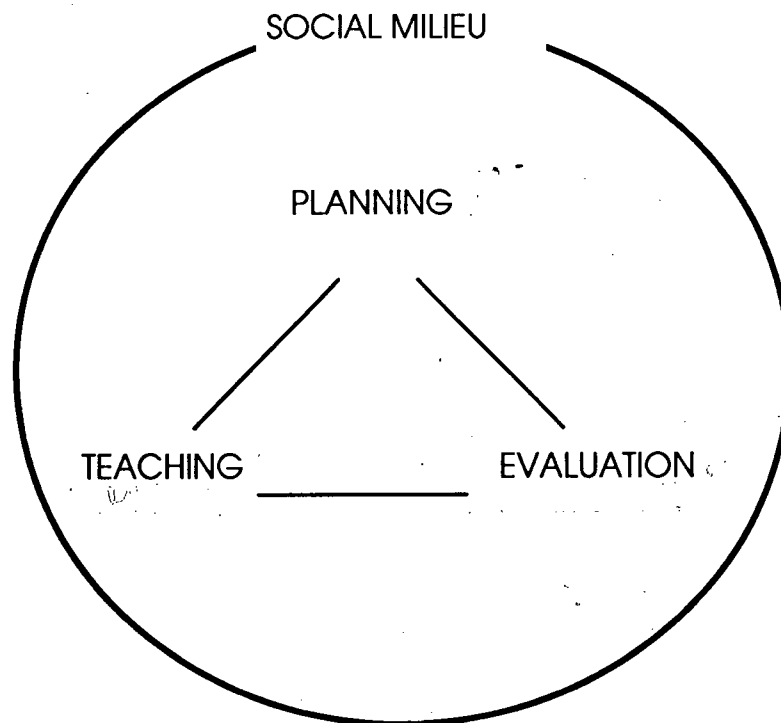
Figure 2. Heuristic Model of Program Implementation in a Social Context

Program implementation is thus viewed as an individual and social contextual process. Worksite health promotion literature, program planning theory, adult teaching theory and program evaluation theory offer insight for implementation frameworks to implement a worksite health promotion program for exercise behaviour change.

Workplace health promotion

A review of workplace health promotion literature reveals the factors that shape the implementation of a worksite health promotion program. The literature will be examined to describe the rationale for, and participation in, workplace health promotion. The potential benefits from workplace exercise programs will be considered and, finally, literature pertaining to worksite health promotion will inform us about the influences of employee exercise behaviour and the role of worksite health promotion.

Rationale for emerging workplace health promotion

"Health promotion works through concrete and effective community action in setting priorities, making decisions, planning strategies, and implementing them to achieve better health. At the heart of this process is the empowerment of communities, their ownership and control of their own endeavours and destinies" (Ottawa Charter, 1986). For many people in industrial societies, the worksite has become the focal point for community and social identity. Green and Kreuter (1991) pointed out that, "it is where most daylight

hours are spent, where friendships are made, where many of the rewards that make one feel worthy are dealt, and where one can be reinforced by peers and significant others. It is also a place where one feels pressure to perform and deliver" (p. 309). This setting, therefore, has the advantage and potential to reach a large proportion of society for multiple health promotion initiatives.

Studies have suggested that positions with high demands and low decision making authority in occupational settings are more susceptible to a range of health related illnesses (Gardell, 1982; Holt, 1993). This is particularly relevant with the growth in clerical and service occupations whose employees are typically isolated by computer terminals and software innovations which encourages low control, social isolation, repetition and high demands that often result in increased absenteeism, reduced productivity and increased burn-out and fatigue (Holt, 1993). The Johnson and Johnson company (1991) found that stress related disability claims were the most rapidly growing form of occupational illness within the workers compensation system in the USA. Various incentives lead employers to implement workplace health promotion programs. These may include reduced health care costs, reduced injuries, reduced staff turn-over and absenteeism, increased productivity, improved corporate image, increased employee morale, increased ability to attract and retain good employees, improved labour relations and a positive return on investment (Lovato, Green and Stainbrook,

1993). According to Don Champion, Vice president of Human Resources for BC Telephone Company, "it doesn't take much logic to know that a healthy person will do better work than an unhealthy one, who is going to cost you money in absenteeism, a lack of commitment, and in not thinking on your behalf...Employee health promotion results in longevity and an increased vitality in the workplace" (Health Promotion in the Workplace, 1991).

Despite cost-effectiveness being a primary motive for worksite health promotion, the continued growth of programs since the 1980's in the absence of such evidence suggests the importance of other factors, such as concern for employee health and well-being (Green & Cargo, 1994). An implicit belief in this statement is that a fitter workforce is the way forward for a business to remain successful in competitive markets while also meeting employee demands for less job-related stress and greater job satisfaction. Sciaccu, Seehafer, Reed and Mulvaney (1993) did not find that program participation was associated with reduced medical costs and, therefore, advocated caution about health costs savings effects from workplace health promotion programs. From a comprehensive review of broad-based health promotion and disease prevention programs in major companies, Pelletier (1993) found evidence, however, to suggest that they are both health and cost effective. He argued that, "When anyone cavalierly dismisses 48 studies with the glib dismissal of 'there is no evidence', they are simply ignorant of more than

13 years of increasingly sophisticated research with documentation of both health and cost outcomes" (p. 52). Green and Cargo (1994) identified multiple factors that have evolved and converged to influence the growth in workplace health promotion, including, the changing demographic profiles in the workplace, rising medical costs that place a burden on industry and an increasing awareness of the potential to influence behavioural and environmental precursors of health.

<u>Participation in workplace health promotion programs</u>

Participation in workplace health promotion programs may interfere with work-related activities and create disruptions in scheduling or employee relations. A number of barriers can, therefore, prevent the implementation of worksite health promotion programs. For example, management may be sceptical about the cost-benefit analysis of supporting such programs; trade unions can be suspicious that workplace health promotion programs are top-down management ploys to divert responsibility of employee health from poor environmental working conditions to the behaviour of the employees; and some employees may be reluctant to engage in programs that deal with personal issues and non-employment activities with other workplace personnel. Glasgow, McCaul and Fisher (1993), in a review of the workplace health promotion literature, suggested four key factors for increasing worksite participation in health promotion: a flexible program, match intervention with organisational culture, tailor to specific needs and circumstances, and multiple promotion and recruitment methods.

They suggested that the resource allocation and management/union support for the worksite program can be used as a measure of worksite organisational readiness to change. Furthermore, logistical factors within the workplace may also restrict access to programs such as staffing and release time in work time, after work transportation and domestic organisation and the cost of implementing programs. Thus, programs may be condoned but not supported by key personnel in the workplace setting. Despite these obstacles, Glasgow et al. (1993) reported that approximately 66% of worksites with 50 or more employees offered at least one type of health promotion activity.

In terms of enhancing employee participation in worksite health promotion programs, Henry and Basile (1994) found that knowledge for its own sake and meeting new people were weak motivational factors. In contrast, they found that social and institutional factors to meet individual needs were the main influence on the decision to participate. Studies have shown that employees who enrol in worksite health promotion programs are more likely to be female rather than male, healthy rather than unhealthy (unless an individual has been classified as high risk), and tend to have been inactive during their youth (Conrad, 1987; Glasgow et al., 1993; Steinhardt & Carrier, 1989). Fielding (1984) found that participation rates in workplace health promotion programs ranged from 20%-40% for programs offered on site to 10% to 25% for programs offered off-site. It would appear, therefore, that employee

participation in a worksite health promotion program is enhanced when the program is located on-site and is offered in work time but not through coercion, is financed by the workplace and is flexible to meet the needs and circumstances of those who attend the program (Anspaugh, Hunter & Savage, 1996; Emmons, Linnan & Abrams, 1996).

Workplace health promotion and physical activity

The workplace context appears to offer a convenient and cost-effective environment in which to promote regular exercise and physical fitness. This view appears to be consistent with the considerable expansion of corporate health / fitness / wellness programs in the workplace since the 1980's. In a review of eleven worksite studies, Shephard (1989) found that ten studies showed increases in productivity, and eighteen out of nineteen studies showed a trend toward reduced absenteeism following corporate fitness interventions. Table 5 represents a summary of current studies from Medline, Psych Abstracts, CD Rom (Sportdiscus), and a personal search of relevant publications that have investigated the cost-effectiveness of fitness programs in the workplace.

Table 5. <u>Cost-Effectiveness of Worksite Fitness Programs</u>

Author, Date	Company	Time Period	Workplace Benefits
Bertera (1993)	DuPont	3 years	Reduced medical costs (12%)
Doherty (1989)	Tenneco	1 year	Reduced staff turn-over (13%)
Edington (1994)	DuPont	6 years	Positive return on investment ($2.05 per $1)
Edington (1994)	DuPont	6 years	Reduced absenteeism (47.5%)
Henritz et al. (1989)	The Coors Brewing Co.	6 years	Reduced medical costs ($1.4 million)
Johnson et al. (1990)	Saatchi and Saatchi Advertising Co.	-	Increased productivity (63% self-report)
Leatt et al. (1988)	The Canadian Life Assurance Co.	7 years	Reduced staff turn-over (32.4%)
Leutzinger et al. (1991)	Union Pacific Railroad	-	Increased concentration (78%)
Pelletier (1993)	Blue Cross Blue Shield	5 years	Positive return on investment ($2.51 per $1)
Shephard (1992)	Toronto Life Assurance	7 years	Reduced staff turn-over (8.1%)
Shephard (1992)	Toronto Life Assurance	6 months	Reduced absenteeism (22%)
Shephard (1992)	DuPont	6 months	Increased productivity (7% in performance)
Wood et al. (1989)	General Mills	2 years	Positive return on investment ($3.50 per $1)
Wood et al. (1989)	General Mills	2 years	Reduced absenteeism (44%)
Yen et al. (1991)	Steelcase	6 years	Reduced medical costs (55%)

Evaluation literature, however, supporting workplace benefits from fitness initiatives is not without its limitations. First, studies typically differ in their definitions of fitness programs, from on-site equipment facilities to supervised aerobic classes. Second, workplace

outcomes were defined in a variety of ways and measured using different instruments from self-report questionnaires to the observation of workplace records. Third, interpretations from outcome measures were often made in the absence of controlling for other variables that may have had a significant effect on the recorded changes, such as the downsizing of companies, selection criteria for new personnel, new technologies in the workplace and a variety of innovative staff incentive schemes. Fourth, programs that were part of a comprehensive health promotion program may involve the synergistic interaction of the different components. These limitations have led to continual calls in the workplace evaluation literature to employ more scientific and rigorous evaluation designs that include random assignment to experimental and control groupings.

Field research is fraught with complexity and changing circumstances that make true experimental methods virtually impossible. These realities are further compounded in worksites by employers resisting having the employees randomly assigned to receive or not receive a program. From this epistemological position of knowledge construction, quasi-experimental designs, therefore, are likely to be the most realistic and effective method to employ in the context of the worksite. Methods of inquiry from alternative epistemological paradigms are also more likely to inform and best assess the process and outcomes of workplace health promotion programs.

In spite of acknowledged methodological limitations, research tends to support the view that employee fitness programs contain costs and produce workplace benefits. Green and Kreuter (1991) advocated caution, however, against overselling program benefits since worksite health promotion is one element of a larger context of change, and benefits accrue from sustained efforts over a long-term period. It is of interest to note that worksite evaluation literature has typically focused on benefits that accrue from fitness programs with an exercise orientation, rather than classroom-based health education programs that are intended to enhance the self-directed application of regular exercise. Oldenburg, Owen, Parle and Gomel (1995), in an evaluation of four worksite based cardiovascular risk factor interventions in Australia, found that less-intensive approaches (exercise facilities and aerobics classes) can be made available at relatively low-cost, but more intensive and expensive approaches such as individual behavioural counselling can be as cost-effective and can produce more sustained risk factor changes. The worksite Lifestyle Skills Motivation program, therefore, took a middle-ground approach to effecting behaviour change, between educational and environmental efforts to enhance critical self-directed learning for exercise behaviour change.

Worksite health promotion and exercise behaviour change

Health promotion professionals clearly need to be sensitive to conflicting interests between employer and

employee in terms of the focus and balance between educational and environmental strategies that may enhance health behaviours in the workplace setting. Employee physical activity levels are influenced by individual and broad macro (societal), meso (workplace) and micro (local implementation) social and other contextual factors. The most effective workplace health promotion interventions, therefore, are likely those combining behaviour change models from these specific literatures. According to Green and Cargo (1994), such integration has not yet emerged as a standard in health promotion, let alone workplace health promotion. They called for greater collaboration between the disciplines in academia to cross conventional barriers and to close the gap between theory and practice in order to develop and test progressive innovations. McLeroy (1993) cautioned, however, that combining theories in the implementation of health education is not completely satisfactory since there are no guidelines for selecting individual or combinations of theories.

Worksite health education is unlikely to have an immediate, direct impact on exercise behaviour though it can predispose (enhance knowledge, attitudes and beliefs), enable (improve skills to overcome barriers) and reinforce (facilitate sources of reward and support) it. Traditional worksite approaches to increase physical activity, however, are often targeted at predisposing factors and typically include: providing information from medical or fitness screening, health risk appraisals, or literature concerning

the risks to inactivity and guidelines for exercise prescription. Exercise behaviour, however, is often more time consuming and effortful than most other health-related behaviours that are targeted for change. Consequently, these approaches have tended to stimulate initiation of physical activity but do not tend to sustain participation (Dishman, 1991). This may be because these approaches focus on how to prevent ill-health and on abstract concepts of health or longevity, rather than on positive health (i.e., well-being and fitness) and developing skills to overcome contextual barriers and the specific biological aspects of exertion such as perceptions and sensations that may prompt and reinforce activity or inactivity in some people. Hardy and Rejeski (1989) asserted that the psycho-physiological consequences that occur during or closely following exercise behaviour are likely to be much more powerful influences on subsequent participation than those that do not occur until sometime in the distant future.

Vertinsky (1992) advocated that health promotion approaches should move from intervention to involvement, and ultimately focus upon empowerment and an improved quality of life. According to Green and Ottoson (1994), "to effect behavioural change, health education in any setting requires a planned sequence of experiences and activities over time, that are tailored as much as resources will allow to the circumstances and prior experiences of specific groups

(corporate norms and employee culture) and even individuals"
(p.75).

Planning models and health promotion

Adult educational planning links intentions with proposed
actions and involves a decision-making process and a set of
related activities that produce educational program
specifications for one or more adult learners (Sork, 1994;
Sork & Caffarella, 1989). Multiple planning models exist in
adult education which can be described as varying on a
continuum from <u>directive</u> (top-down) to <u>reactive</u> (bottom-up),
(Adams, 1991). Directive models at one end of the continuum,
are characterised by a top-down linear process with abstract
objectives and a context-free conceptualization. Cervero and
Wilson (1994) suggested that these models are
epistemologically limited, inaccurate and morally and
politically naive. In contrast, reactive models situated at
the other end of the continuum focus on a bottom-up planning
process that are void of any predetermined agenda, focus or
structure. Interactive models, on the other hand combine
aspects of directive and reactive planning. Interactive models
are mutually supportive and typically involve collaboration,
negotiation and power sharing to respond to the context of the
educational experience. Planning models, therefore, not only
vary in central concepts but are mainly differentiated by the
underlying assumptions about how program planning should take
place.

An educational program is thus the product of a complex array of interpersonal and institutional interests which are often in conflict, constantly changing, and sometimes invisible or at odds with the planner's own values and intentions (Cervero & Wilson, 1994). Forester (1989) contended that program planners make practical judgements about program planning that are based on the social context. These include negotiating with others, choosing among conflicting wants and interests, developing trust, locating support and opposition, knowing the informal ropes as well as the formal organisational structure and being sensitive to timing. The political nature of program planning clearly illustrates how some interests become more central and some more down-played than others. Program planing in adult education, therefore, is not a value-free process.

Traditional health educational practice is often driven by practitioner's perceptions of the efficacy and appropriateness of specific interventions, rather than by theoretical models (McLeroy et al, 1993). Models do, however, provide a framework for the application of theories that are relevant to health education design. A number of theoretical models have been proposed in the literature in an attempt to explain health behaviour and to guide health education planning.

The Health Belief Model (HBM) has been instrumental in the design of many traditional health education programs and has been applied extensively to a wide range of health

behaviours. The HBM hypothesises that people will not seek
preventative health behaviours unless they possess minimal
levels of health motivation and knowledge, view themselves as
potentially vulnerable, view the condition as threatening, are
convinced of the efficacy of the treatment and see few
difficulties in undertaking action (Becker & Maiman, 1975). A
number of studies, however, have shown that the HBM has been
relatively unsuccessful in explaining exercise behaviour
(Biddle & Ashford, 1988; Lindsay-Reid & Osborne, 1980).
Exercise behaviour is a complex process rather than a single
behaviour (e.g., contextual influences, prior experience,
motives and stages of exercise behaviour) and the benefits
from exercise are not necessarily immediate, rather, they are
likely to be accrued in the distant future. Essentially, the
HBM has a psychological orientation with an emphasis on
cognitive factors (knowledge, intentions, attitudes, values
and beliefs) to predict exercise behaviour. Some of these may
reflect perceptions of the social context, but are not direct
indicators. Thus, a change in cognitive factors may initiate a
change in exercise behaviour but they are unlikely to be
sufficient to enable, reinforce and therefore sustain an
exercise behaviour change. The HBM does provide some
guidance, however, for explaining the predisposing factors in
Green and Kreuter's (1991) broader conceptual framework for
health promotion planning.

Other health promotion planning models continue to emerge
or evolve, for example, ecological approaches which provide

more guidance pertaining to intervention settings (Richard, Potvin, Kishchuk, Prlic, & Green, 1996). Few studies, however, have been conducted using these alternative approaches, unlike the Precede-Proceed model with hundreds of published applications and dozens of formal studies.

Precede-Proceed model

Green and Kreuter's (1991) Precede-Proceed model is a contemporary approach to health education planning and evaluation (see Figure 3). This is a flexible model that combines both "directive and reactive" planning (Adams, 1991). According to Green, Richard and Potvin (1996), "some 400 published applications of this model have demonstrated its utility as a framework for planning and evaluation in a wide range of health issues at all levels from individual to national, encompassing both behavioural and environmental determinants of health and quality of life, and providing for strategies to match the targets at educational, organisational, regulatory, and policy levels" (p.277). Precede-Proceed takes into account multiple factors that influence health status and therefore provides direction for planning multiple approaches for health education programs.

PRECEDE

Phase 5 Administrative and policy diagnosis	Phase 4 Educational and organizational diagnosis	Phase 3 Behavioral and environmental diagnosis	Phase 2 Epidemiological diagnosis	Phase 1 Social diagnosis

[Diagram showing the Precede-Proceed model with boxes: HEALTH PROMOTION containing Health education and Policy regulation organization; Predisposing factors, Reinforcing factors, Enabling factors; Behavior and lifestyle, Environment; Health; Quality of life]

Phase 6 Implementation	Phase 7 Process evaluation	Phase 8 Impact evaluation	Phase 9 Outcome evaluation

PROCEED

Figure 3.   Precede-Proceed Model (Green and Kreuter, 1991)

Essentially, this is a problem-focused model that relies on a variety of theories to guide multiple interventions to change health behaviour. The Precede planning phase of the model generates specific objectives based on the needs and circumstances of the population, group or individual, while the Proceed phase is a realistic and flexible evaluation framework to assess whether and how health promotion programs made a difference.

The Precede phase focuses the planning process initially on outcomes and then progresses backwards across the several levels of needs toward the administrative resources that would be required to initiate a program so that these needs would be

met and the required outcomes achieved. This process encourages health education planners to begin planning by asking why they are providing specific programs before they ask themselves how they are going to do it (Green & Kreuter, 1991). A needs assessment is therefore, necessary so that health education programs can be tailored to meet the needs and circumstances of the worksite employees. Second, it serves as a vehicle for promoting health promotion in the workplace. Third, organisational culture is believed to influence employee motivation, perceptions, behaviour, job performance, and job satisfaction. For a program to succeed, therefore, it is important that a planning needs assessment is conducted to match the intervention with the workplace culture (Glasgow et al., 1993).

Essentially, Precede begins with a <u>situational analysis</u> to determine the organisational, political and interpersonal context in which the program is to be planned. These factors can shape the planning of the program in terms of both the approach to planning and the degree of commitment to the planning process.

Health is not an end in itself, but is a resource for everyday living. Thus, the next phase of the planning focuses on a <u>social diagnosis</u> by engaging the sponsors and target group to identify their quality-of-life or social and economic concerns. Precede-Proceed is based on the idea that people have the ability to influence their own health and well-being

and it therefore encompasses the principle of participation and the theory of self-efficacy.

The epidemiological diagnosis phase of the planning process takes into account the available data on the prevalence of particular health goals/problems that are likely to contribute to the previously established quality of life concerns. Health priorities are expressed as objectives by specifying who will benefit how much of what outcome by when (Green & Kreuter, 1991).

A behavioural and environmental diagnosis consists of relating specific behaviours and environmental conditions that may affect the health and social or economic issues raised in the preceding diagnoses.

The educational and organisational diagnosis directs attention to three key factors that are likely to be employed in a health education program to bring about behavioural and environmental changes: predisposing factors are antecedents that provide the motivation for change (knowledge, beliefs, attitudes, values and perceptions); enabling factors are personal or environmental conditions that facilitate or hinder change (skills, resources, access, convenience, cost and barriers); and reinforcing factors occur during or subsequent to behaviour, providing continued reward and incentive for the change to occur in practice (social forces, external and intrinsic rewards, recognition, and well-being).

Finally, an administrative diagnosis assesses the finances, resources, venue, scheduling and marketing

requirements that would be necessary for the program to operate.

Mullen, Hersey and Iverson (1987) compared the effectiveness of three models in explaining exercise behaviour: Precede-Proceed, Theory of Reasoned Action, and the Health Belief Model. They found that the variance accounted for in physical activity level by these models was 58%, 57% and 57% respectively and concluded, therefore, that the Precede-Proceed model offers a useful framework to explain involvement in leisure-time physical activity. The differences favouring Precede-Proceed were greater for other health-related behaviours. A major difference between Precede-Proceed and the other models in these comparisons was the inclusion of environmental enabling and reinforcing factors in Precede-Proceed. The relatively small difference between variance accounted for by the three models in relation to exercise might suggest that cognitive factors are more important than environmental factors in determining exercise behaviour.

Precede-Proceed model can be used as an educational, organisational and procedural framework to address the needs and circumstances of a specific group. In addition to the growing body of evidence to support the utility of the Precede-Proceed model in a variety of settings, it also has broad implications for many forms of adult education (Houle, 1992). Essentially, Precede-Proceed model provides a guiding framework for planning and evaluation of worksite health promotion programs.

Adult teaching theory

Adult teaching theory provides guidance for an instructional framework in the context of worksite health education. Significant developments have occurred over the last twenty-five years in the approaches that have been taken to the study of teaching adults. A brief review will be presented of the varied approaches that currently contribute to the theory of adult teaching. This will be followed by contrasting didactic and learner-centred approaches to the instruction of worksite health education programs. A learner-centred approach where both teacher and learners are engaged is central to the delivery of the proposed worksite health education program.

A plethora of literature has addressed research on teaching. Smith (1987), in his review of the literature, identified the following definitions that had been ascribed to teaching: a process for imparting information; a process for enhancing learning; and an intentional activity to create change. Barrow and Milburn (1990) added that teaching was a polymorphous word that describes a multifaceted phenomenon. The literature has suggested multiple roles for the teacher of adults which include: a content specialist and facilitator of adult learning (Knowles, 1984); an artist, facilitator and critical analyst (Brookfield, 1989); to develop an active and supportive learning environment (Knox, 1986); to help people see things deeply, more critically (Apps, 1991); authority,

motivator and guide, facilitator, and consultant (Grow, 1991);
and to foster critical reflection (Mezirow, 1994).

Powell and Beard (1987) indicated in a review of the
literature, that multiple approaches have been taken to the
study of teaching which include the classroom context, teacher
characteristics, teaching styles, teacher effectiveness,
teacher behaviour modification and teacher evaluation. Dunkin
and Biddle's (1974) model, in particular, had a significant
influence on the study of teaching. This model was developed
to examine the relationships between presage variables
(characteristics that a teacher brings to a learning
experience), process variables (actual activities and
interaction that occurs in the classroom), product variables
(intended outcomes or unanticipated results of teaching),
and/or context variables (circumstances to which the teacher
must adjust) in an instructional setting.

Alternative approaches to the study of teaching have
focused on a cognitive perspective. Research from this
perspective places less emphasis on the behavioural component
of teaching and more on the thoughts and strategies that occur
throughout this complex decision-making process. Implicit in
this approach to the study of teaching is that teachers'
cognitive processes influence how they plan and make critical
judgements concerning the practice of adult education. This
line of inquiry has more recently investigated how teaching is
conceived and understood by teachers of adults (Clark &
Peterson, 1986; Larson, 1986; Pratt, 1992). Pratt (1992)

described conceptions of teaching as abstract, cognitive representations and <u>normative</u> epistemological beliefs about how people think of teaching. According to Hiemstra (1988), a teacher's philosophical values and beliefs about the nature of teaching and learning are reflected in the way that he or she decides on the desired learning outcomes/goals for a lesson, the selection and specific use of appropriate content, the selection of instructional methods and the modes of communication throughout the learning experience. Apps (1989) claimed that critical self-reflection of one's philosophical foundations was the basis of effective teaching.

Larson (1983) suggested that there were two different conceptions of teaching; teacher-centred and learner-centred. In contrast, Pratt (1992) found multiple ways in which teachers of adults conceptualise teaching. He identified five conceptions of teaching held by teachers of adults from five different countries. The five conceptions of teaching and their underlying assumptions about teaching and learning were described in the following way: <u>Transmission</u> (teaching should be systematic to improve the efficient transmission of information and learning is enhanced by shaping the learning environment); <u>Apprenticeship</u> (teaching should model the knowledge and values of the teacher and learning is situated in context); <u>Developmental</u> (teaching should cultivate the intellect and learning is self-directed and involves levels of cognition); <u>Nurturing</u> (teaching should develop the self-concept and personal agency and learning is interactive and

conducted in a conducive learning environment to enhance self-directed learning); and <u>Social Reform</u> (teaching should seek a better society and learning is challenging implicit societal assumptions and taking action to change society). Pratt found that although individuals often hold two or more conceptions of teaching, one is usually more dominant.

It is important to clarify the distinction between conceptions of teaching and teaching styles. According to Pratt (1992), conceptions of teaching are grounded in a teacher's social, cultural, historical and personal realm of meaning and, therefore, tend to be relatively stable across teaching situations. In contrast, teaching styles refer to a range of teaching behaviours that vary on a continuum from teacher-centred to learner-centred instruction. According to Conti (1985), a teacher's style is the conduit for translating his or her internal philosophical beliefs into external practical action. Kuchinskas (1970) found that teachers' attitudes conveyed through style influenced the learning environment more than any other factor. Grow (1991), on the other hand, suggested that teaching style was an external teacher characteristic that could be modified to respond to students' learning styles. This implies that teaching styles are ways of guiding and controlling learning experiences and should, therefore, vary according to the circumstances of the learning situation. Candy (1991), however, found that teachers often find it very difficult to make the transition from teacher-centred to learner-centred approaches. Tennant (1992)

expressed reservation both about a teacher's ability and willingness to adjust according to the situation. Reluctance to adapt teaching style may reflect a teacher's perceived loss of control, being socialised into the long term practice of a teacher-centred approach or the extent to which a teacher's epistemological beliefs about teaching limits the range of teaching behaviours.

Adult education occurs in diverse socio-cultural and political settings. Teachers of adults also come from heterogeneous backgrounds. Multiple conceptions of teaching, therefore, add further support to our understanding of the pluralistic nature of teaching adult education. Grow (1994) stressed that there is no one way to teach or learn well. Instruction of adult education is thus presented as a complex and multifaceted process.

Traditional approaches to teaching adult health education

The didactic approach to teaching tends to be teacher-centred and grounded in behavioural psychology. From this approach the teachers are the active ones in an authoritarian transmission of information while the learners are passively educated. In terms of health education, this often means that the teachers are very 'powerful' with the special knowledge, training, and experience that allow them to control and solve other people's lifestyle problems. This approach to teaching clearly places value on the content-credibility and expertise of the teacher. However, this perpetuates a widely prevalent

but erroneous view that health education teachers possess all the necessary information and solutions concerning particular health issues.

In its extreme form, a teacher-centred approach to health education (e.g., as taught by a drill sergeant in the army, or by a coach in a gym class on a rainy day at a school without trained health educators) is characterised by having clearly defined and rigid lesson objectives, and a highly structured agenda. The process of teaching is represented by a systematic, accurate and efficient teaching "performance" that relies heavily on precise time management. Preferred methods to disseminate the information include lecture format, video presentation and self-analysis questionnaires. These methods lend themselves to minimum interaction and a one-way communication process. Traditional teachers prefer to employ these methods for control purposes which, in turn, structure timing and thus ensure that lesson objectives can be achieved.

From this approach, learners are perceived as anonymous "mass receivers" and "absorbers" of content. Freire (1992) referred to this as the "banking concept" of education. Individualising the material, therefore, is given a lower priority than the depth and breadth of coverage of the content. Implicit in this approach is that the content is viewed as the "objective gold-standard" and it is the responsibility of the learner to make sense of it. Learning is often assessed, therefore, in relation to the specific objectives that were initially established. It is important to

note, however, that these methods often create a communication vacuum in the classroom and make health education teachers less approachable. Hanna and McGill (1985) cautioned that when learning is reduced to simply receiving a transmission of knowledge, it can foster a disregard for the intrinsic value of learning.

A learner-centred approach to adult health education

In contrast, a learner-centred approach toward adult education (Knowles, 1984) has its roots in humanistic psychology and more recently has been integrated with a sociological perspective of adult education. This approach takes into account both personal development and broader social and other contextual factors that influence behaviour change. Essentially, a learner-centred approach provides a broad view of teaching worksite health education where teacher and learners are engaged as partners in the educational process. According to Knowles (1984), although adults are often thought to be self-directed learners, the teacher continues to occupy a significant role in adult learning and is considered the most important variable influencing the learning climate.

Freire (1970) cautioned that "some educators have a mechanistic, superficial approach to climate building and want to create the appearance but not the reality of equal relationships. He added that we have to be serious about wanting learners to find their own voice" (p.3). Recent self-

directed learning frameworks have been developed that offer guidance for student empowerment (Grow, 1991; Hammond & Collins, 1991; Wallerstein & Bernstein, 1988). Shor (1993) advocated that a Freirean critical teacher is a problem-poser who asks thought provoking questions and who encourages students to ask their own questions. From a learner-centred approach, therefore, the role of the teacher centres on creating a safe environment in which to guide, support, challenge and stimulate critical thinking and problem-solving for individual and collective exercise behaviour change. This process is thus characterised by a collaborative, co-operative, critically reflective, and hands-on interactive process with negotiated objectives, methods, and evaluative criteria.

Compared to a didactic approach, a learner-centred approach to teaching encourages a much closer relationship between the teacher and the learner. According to Ulmer (1980), teachers of adults indicated, in order of priority, the following characteristics of successful teachers: knowledge about the learner, love of people, knowledge of subject, individualising instruction, patience, sense of humour, ability to communicate and creativity. Thus, a relationship that is based on mutual trust and respect creates minimal defensiveness and power differentials which allow both the teacher and the learner to be more relaxed and open. Billson and Tiberius (1991) noted that when students feel at ease with the teacher they reveal the information and feelings

that one needs to understand them. Noddings (1988) referred to the quality of this relationship as "fidelity", which is guided not by obligation, but from an ethic of caring for the development of the whole person. Aspy and Roebuck (1974) found that people who received high levels of empathy, congruence and positive regard were likely to attain more growth than those who were given low levels.

Effective communication, therefore, is central to the relationship between the teacher and learner. This is seen as the means to unlock the potential and power within the learner and to enhance the quality and depth of both teaching and critical self-directed learning. Knox (1983) added that teachers should encourage participants to be resources for their own learning and for the learning of others. This emphasises the broader role of the teacher to do more than simply cater to the individual but also to consider the social contextual nature of teaching and learning.

A learner-centred approach does not imply that only interactive methods would be employed by the teacher, rather, an emphasis would be placed on using multiple methods (e.g., small group discussion, role play, large group discussion, lecture format, case-studies and video presentations). For example, Conti (1989) found that General Educational Development (GED) students learned more in a teacher-structured environment than those students in a learner-interactive environment. Multiple methods, therefore, acknowledge that learners are at different stages of learning,

learn at different rates and have different learning styles. Grow (1994) asserted that different styles work for different learners in different situations. Rogers (1983) suggested that the method per se is not as important in determining effective teaching as is the affective environment that is created which nurtures success from whatever method the teacher feels most comfortable in using. A learner-centred approach thus ensures that the learning experience is appropriately pitched, challenging, successful and enjoyable which can foster a motivation for lifelong learning.

It is important to note, however, that some adult learners may not prefer this approach to teaching, especially those who are used to rigid formal education and have not had recent educational experiences. In this context, these people may initially be apprehensive about the perceived openness, critical reflection, active effort, and responsibility that is required for their own learning. Brookfield (1990) pointed out three other potential problems with this approach to teaching:

(1) a facilitator must always please the learner by meeting his or her needs in the manner that he or she requested;

(2) the learners are always the best judges of their own interests; and

(3) teacher burn-out.

Clearly, when this approach to teaching is practised to the extreme, it can be overly consumerist (Pratt, 1992). Tennant (1986) noted that it is unreasonable to expect individual needs to be in harmony at all times with organisational goals,

and in instances of conflict, individual needs may well be compromised. A teacher must therefore, find a balance between caring and negotiating learning aims with those that are challenging and go beyond the comfortable ways of thinking and acting in order to enhance growth. Additionally, individualised instruction of this magnitude needs to be balanced with social and other contextual considerations.

A learner-centred teacher must know his or her own personal boundaries between teaching, counselling and facilitating learning. This is particularly relevant when teaching adult health education in such a way that excessive personal and emotional involvement in the learners' progression toward a lifestyle change can be prevented. Tennant (1992) pointed out that too close a relationship between the teacher and the learner can also suppress conflict, where some conflict may be seen as a natural and desirable outcome of the interaction of two or more inquiring and challenging minds.

A learner-centred approach to teaching, therefore, is not simply a soft passive approach to teaching adult health education. The teachers are also challenged and develop a reflective practice by taking time to critically analyse their actions, their effects on student learning and on their own personal beliefs regarding the nature of teaching and learning. Reflective teachers of health education remain current in the knowledge of the field, reflect on this knowledge and thoughtfully incorporate this into their

practice. A critically reflective teaching practice can prevent hegemony in learning experiences and, therefore, help the program to meet the diverse needs of learners from multiple backgrounds.

Essentially, a contemporary approach to teaching health education values the social nature of learning and strives to empower students, individually and collectively, toward self-directed learning and a critical practice. Finally, the teacher maintains a reflective practice, remains open to new ideas, reflects an enthusiasm for both teaching and learning and avoids the negative habits of burn-out or apathy.

For the purpose of this study, a learner-centred approach was taken to the teaching and learning of the worksite health education program. This was operationalised through various classroom contextual strategies (e.g., creating an appropriate physical and social environment) and curriculum and instructional strategies (e.g., varied teaching styles, developing responsive and authentic learning experiences with an emphasis on critical thinking, co-operation, collaboration and skill application). According to Davenport and Davenport (1985), adult education instruction that advocates an integrated world view is likely to stress unity in education. This approach to teaching is consistent with the dominant purpose of health promotion of enabling people to increase control over the self-management of their own health behaviour. Further, it expresses the philosophy underlying contemporary views of self-directed learning, Self-Efficacy

Theory, the stages of behaviour change and the principle of participation that are central to Green and Kreuter's (1991) Precede-Proceed framework.

Program evaluation theory

The impetus and initiative for program evaluation was born during the sixties in western societies, exemplified during the Johnson and Nixon administrations in the USA. This period was characterised by huge investments made in social programs for economic, social and political reasons. Accompanying these social policies came concerns about rising defence and social program budgets, increasing unemployment and claims with respect to gross mismanagement, abuse, and corruption in Federal programming. This social and political context created the need for a quality control approach to program evaluation. Early evaluation theories thus began by emphasising a search for truth about effective solutions to social problems through experimental approaches (Campbell, 1969; Campbell & Stanley, 1963; Scriven, 1967). These theories focused primarily on program outcomes (though scriven advocated goal-free evaluation) and adopted quantitative methods from the natural sciences to control for bias. Relying on program goals or isolated quantitative behavioural variables to evaluate a program, however, is too simplistic and inadequate to reveal the degree to which programs are part of a larger system of thoughts and actions. For example, program goals are often vague, are not sensitive to on-going

changes in program purpose, and are not universally implemented in all settings. Furthermore, this approach tended to be problematic in the field, produced equivocal findings, yielded limited terminal data with little use to improving program processes (Thompson, 1992).

Consequently, during the seventies, evaluation theories emphasised the use of evaluation findings and focused on describing the context in which programs were implemented (Stake, 1975; Weiss, 1973; Wholey, 1977). Implementation analysis offers a realistic and flexible framework in which to assess the dynamic life of contextually-bound programs. The main task of implementation analysis, according to Ottoson and Green (1987), is to find the middle ground between the intent of concept and the realities of the context. Implementation is, therefore, clearly central to the agenda of contemporary program evaluation theory and practice. Initial methods employed, however, were relatively costly, specific, susceptible to bias and, therefore, tended to have reduced marketplace appeal or confidence (Shadish, Cook, & Leviton, 1991). Later theories of program evaluation (e.g., Cronbach, 1986b, Rossi, 1982) attempted to integrate and build on the two previous phases of evaluation theory and to offer an evaluation perspective from alternative paradigms (Guba & Lincoln, 1989). Subsequent perspectives on program evaluation have contributed to our further understanding of how these alternative paradigms can inform evaluation.

Cronbach et al. (1980) noted that social programs are complex, multivariate packages that operate in a socio-political context and therefore, detract from theoretical purity and the likelihood of exact transfer to other settings. To assess the value/merit or worth of a program, thus poses a major challenge for program evaluators. Sork (1990) advocated that program evaluation should be an on-going and integral part throughout the life of an educational program. Martens (1994) noted, however, that different perspectives of program evaluation have shaped multiple types of educational evaluation practice (e.g., formative, implementation, process, impact, efficiency, outcome, cost-benefit, summative and other). Program evaluation is thus a changing and dynamic field.

The literature has made several attempts to organise and categorise program evaluation theories and frameworks; for example, politically oriented evaluation, questions oriented evaluation, and values oriented evaluation (Stufflebeam & Walker, 1983); fourth generation evaluation (Guba & Lincoln, 1989); and stage theorists, and five components of evaluation theory (Shadish, Cook, & Leviton, 1991). According to Thompson (1992), program evaluation frameworks "differ in their conceptions as to what evaluation is, what the relationship with the primary client and other stakeholders should be, who should be making the relevant judgements regarding the program, and the criteria for judging the evaluation itself" (p.68). Multiple perspectives on the theory of program

evaluation has thus influenced various ways in which program evaluation has been defined in the literature. For Wholey (1979) program evaluation is the measurement of program performance, the meeting of comparisons based on those measurements, and the use of the resulting information in policy making and program management (p.1). According to Cronbach (1963), it is the collection and use of information to make decisions about an educational program where many types of decision are to be made and many varieties of information are useful. Shadish, Cook and Leviton (1991) noted that program evaluation is only one part of a complex interdependent problem-solving sequence that includes problem definition, solution generation, solution implementation, solution evaluation and solution dissemination.

Various definitions of program evaluation have created diverse perceptions in the literature regarding the primary purpose of evaluation. For example, to construct value statements (Scriven, 1972); to determine causal relationships between specified independent and dependent variables or to judge the relative merits of alternative services (Campbell, 1969); to assist some audience to judge and improve the worth of some program (Stufflebeam & Walker, 1983). The American Evaluation Association (1994) summarised by identifying several key purposes of evaluation: bettering products, personnel, programs organisations, governments, consumers, public interests; contributing to informed decision making and more enlightened change; precipitating needed change;

empowering all stakeholders by collecting data from them and engaging them in the evaluation process; and experiencing the excitement of new insights. According to Green and Kreuter (1991), the purpose of process evaluation in health promotion should not be seen as finding the perfect program to package and parachute into any setting but rather to help improve and adapt the program to the circumstances at hand.

The role of the evaluator is essentially to construct and provide the best information (from multiple perspectives) that might bear on the value of the program. The program evaluation literature has emphasised two contrasting roles to fulfil this goal: as an external operator to discourage co-optation (Scriven, 1978) and as an internal active participant (Cronbach, 1986; Wholey, 1983). Stake (1975) advocated that evaluators should help local people discover and construct their own truths, their own definitions of the problem, and their own solutions. The primary stakeholder from this perspective clearly centres on program participants. In contrast, Wholey (1983) preferred evaluators to provide feedback that is immediately useful to policy makers and program management. Cronbach (1986b) preferred a much broader role and advised evaluators to be educators to all stakeholders with respect to lessons of experience and critical thinking, about program implementation and giving recognition explicitly to the existence and concerns of other perspectives. Guba and Lincoln (1989) added that other information such as that from documentary analysis, from

studies in similar contexts and from the professional literature should also be provided. Stufflebeam & Walker (1983) cautioned however, that evaluators must be sensitive to their own agendas as well as those that are held by the client and audience. The Program Evaluation Standards (1994) concluded by offering four guiding principles for evaluators: utility, feasibility, accuracy, and propriety.

Scriven (1986) referred to the program evaluation process as involving a multiplicity of multiples. Shadish, Cook and Leviton (1991) suggested that program evaluation should take into account methods, philosophy of science, public policy, value theory and theory of use. It is important to note, however, that judgements made from program evaluation are not value-free since the political world and social context influences the conception, planning, delivery and evaluation processes surrounding social programs. This review of the literature, therefore, suggests that planning and conducting an evaluation varies with the theoretical and political or ideological frameworks being employed.

Evaluation perspectives and worksite health promotion

Evaluators choose among many options to plan and conduct an evaluation based on their personal beliefs, values, political inclinations, technical skills, and the context of the program operation (Thompson, 1992). Green and Kreuter's Proceed model was used as the conceptual framework for the evaluation. This broad framework postulates that a health promotion program can be evaluated at one or more of three

levels: process, impact and outcome. Process evaluation is conducted on the first information that becomes available on program implementation (program inputs, program activities, client reactions, staff performance etc. associated with the administrative and policy diagnosis and objectives produced during the last planning phase of the Precede model). Impact evaluation refers to the immediate effects of a program on the target behaviour or changes in the predisposing, enabling and reinforcing factors associated with the educational and organisational diagnosis in Precede. Outcome evaluation refers to distant (follow-up, post-educational behavioural) or ultimate effects of the program (health, fitness, quality of life, well-being, etc.) that may have been intended or unintended. Thus this multidimensional framework provides a broad and long view of post-educational application which takes into account both the characteristics of the learner and the context in which the change is expected to occur.

For the purpose of this study, the theoretical focus for evaluation was drawn primarily from Cronbach's (1986, 1991) perspective of program processes and the context of post-program implementation. This was supplemented by drawing on Campbell's (1988) perspective of program outcomes to determine better programs among multiple alternatives. These approaches, however, both have underlying theoretical differences about the trade-offs one should make when conducting an evaluation. For example, Cronbach, Ambron, Dornbusch, Hess, Hornik, Phillips, Walker and Weiner (1980), argued that social

programs involve a multivariate world of complex, interdependent causal factors rather than single, bivariate pushes and pulls. Furthermore, programs rarely completely turn-over but rather are adapted to change incrementally by understanding the context of application and improving program processes. The advantages of including an experimental component focusing on time series data collected on key outcome variables justifies it's inclusion as part of an eclectic approach to study program evaluation since it provides particular evidence with respect to post-educational application. For example, policy/decision makers are potential stakeholders in this study and often want comparative information on programs (Scriven, 1993).

Despite its trade-offs and resource intensity an eclectic framework that combines the art, science and politics of program evaluation is best suited to understand the phenomenon of post-educational application from diverse and pluralistic perspectives. This approach is consistent with contemporary knowledge about program evaluation and views knowledge construction as ontologically complex and thus acknowledges multiple epistemologies, methods and priorities based on multiple stakeholders. According to Green and Kreuter (1991), evaluation that provides for a learning-oriented rather than judgement-oriented approach not only will gain the support of practitioners but will also feed back more quickly and thoroughly into program improvements and practice.

Program implementation framework

Context, The Lifestyle Skills Motivation program was offered to management, union and employees in the Department of Housing and Conferences at the University of British Columbia (UBC). The program was provided as a voluntary service from a doctoral student for research purposes. In return, program participants were requested (at their convenience) to complete short questionnaires, program evaluation forms, and participate in brief telephone interviews at specific time periods throughout the implementation period. The close proximity and convenience of this worksite setting enabled the researcher to mobilise the energy and the resources that were necessary to gain sufficient access to the workplace and conduct the planning, delivery and evaluation processes for implementing the Lifestyle Skills Motivation program in this setting. This level of interaction and participation was consistent with the philosophy of the precede-proceed framework.

Planning and evaluation Different models abound in health promotion that describe the change process; for example, Green and Kreuter's Precede-Proceed Model, Prochaska and DiClemente's Transtheoretical Model of the stages of behaviour change, Health Belief Model, Theory of Reasoned Action, Dishman's Lifespan Interaction Model, and Rogers' (1983) Diffusion Model. Green and Kreuter's (1991) Precede-Proceed Model was used as the conceptual framework for the planning and evaluation processes for the Lifestyle Skills Motivation

program in a worksite setting. This model is a useful framework for worksite health promotion programs because of its emphasis on process and broad perspective on context.

Ideally, when using the Precede planning framework, one begins to determine the most appropriate quality of life and health concerns of the target population by engaging them in an open-ended social diagnosis. For a worksite program, the social diagnosis must also take into account the economic concerns of the employer. Green and Kreuter (1991) suggested that for pre-determined programs with little flexibility for change, back-tracking through the model towards the quality of life concerns should help to clarify the intentions and rationale behind prescribed programs. For the purposes of this study, the health issue, health behaviour and educational program were, to some extent pre-determined, as a lack of physical fitness (and the associated potential of hypokinetic diseases), the low participation in and poor adherence to regular exercise and a Lifestyle Skills Motivation program respectively. Despite a predetermined agenda for exercise behaviour change, conducting the Precede phase revealed that program processes needed to be adapted to include weight control and stress management components so that the program was tailored to the needs and circumstances of those attending. The worksite health promotion program was thus developed and promoted using the principles of participation and involvement that are integral to the Precede process. The Proceed phase of the model provides a realistic and flexible

implementation and evaluation framework to investigate post-educational application during and following a worksite health promotion program.

Delivery, A learner-centred approach was central throughout the delivery/teaching/instruction of the worksite Lifestyle Skills Motivation program. This approach employed the principle of participation throughout the implementation process. Thus, program participants were encouraged to be actively involved and the teacher acknowledged that people learn in a variety of ways, are at different stages of learning and learn at different rates. Emphasis was placed on developing a nurturing though challenging climate to empower learners, individually and collectively to think critically and to self-direct health behaviour change.

Summary

There is a research need to develop and evaluate progressive worksite health promotion programs that are intended to enhance exercise behaviour change. Health education is interdisciplinary by its very nature, thus, it is necessary to draw upon theoretical frameworks from exercise science, health promotion and adult education to address this research area.

Despite the lack of evidence regarding worksite health education programs and exercise adherence, the literature suggests that health education programs that are developed using Bandura's (1986) self-efficacy theory are effective in

maintaining a variety of health behaviours. The exercise science literature also reports success in maintaining levels of exercise when interventions have focused on self-regulation and the stages of exercise behaviour change. Contemporary sociological approaches to adult learning inform us of social and other contextual influences, and thus strategies, for enhancing behaviour change. The literature on program implementation takes into account planning, delivery and evaluation processes to ensure that programs are tailored to the needs and circumstances of those attending programs. Implementation of exercise behaviour change is thus viewed as an individual and social contextual process.

The purpose of this study was to gain a better understanding of post-educational application following a worksite health promotion program. Four research questions were generated to guide this investigation. The first question focused on changes of key outcome variables that were measured quantitatively throughout the duration of the study. The second and third question focused on factors influencing application and the actual process of post-educational application. Finally, the fourth question assessed alternative outcomes stemming from a worksite health promotion program. The following chapter outlines the methodological approach in a worksite context that was taken to investigate the phenomena of post-educational application.

Chapter 3

METHODOLOGY

Introduction

This chapter describes the research perspective, twelve-month implementation process and methodology used to study post-educational application following an experimental worksite health promotion program. The chapter begins by presenting a rationale for the research perspective taken to investigate application. The subject population is described together with the design, procedures and instrumentation utilised for this study. The chapter closes by describing the processes by which data were analysed.

Research Perspective

Research is typically situated in a larger theoretical and conceptual paradigm. Research paradigms are rooted in particular sets of lenses that guide all phases of the research process. Research paradigms differ in ontological and epistemological assumptions regarding the nature of reality and the construction of knowledge as well as criteria used to determine the validity of research. Smith (1992) noted that criteria for post-empiricists centre on objectivity through multiple lenses, as the regulative ideal; for interpretivists, it is co-operative human inquiry with as much intersubjective agreement as possible; and for critical theorists it is raising the level of critical consciousness toward oppressive features in society with a

view to social action (p.12). Not surprisingly, therefore, proponents of each paradigm claim to provide valuable information regarding a research phenomenon and suggest that some methods are better than others for constructing knowledge. In a review of research paradigms, Sparks (1994) noted that the historical dominance of the empirical paradigm in educational research is being challenged by the interpretative and critical paradigms in such a way that the focus and methodology of research is changing. Shadish, Cook and Leviton (1991) pointed out, however, that learning about a complex social world requires strong substantive theories and powerful methods, both of which social scientists currently lack. It would seem, therefore, that no paradigm of knowledge construction is without significant difficulties in epistemological and ontological approaches. Thus, each perspective has its own strengths and weaknesses.

> According to Ottoson (1995),
>
> research on application needs to be not only multidisciplinary, but multiparadigmatic. The multiple lenses of post-positivism, the meanings created in context as understood by constructivists, and the nature of reality as critiqued by critical theory each provide different understandings of the experience of application (p.28).

Sparks (1994) viewed a multiplicity of visions as a sign of growing maturity, confidence and effervescence within the research community. It is the author's view that despite

inevitable trade-offs, research embracing multiple paradigms is inclusive of diverse and pluralistic interests and, therefore, provides considerable insight to post-educational application. Essentially, this approach considers knowledge construction to be ontologically complex and thus acknowledges multiple epistemologies, methods and priorities based on an inclusive research agenda. This perspective is consistent with Cronbach's (1980) views of evaluation research as revealing one truth among many. Cronbach advised evaluators to use multiple data collection strategies and criteria gathered from different sources to yield less dependable answers about a broad set of pluralistically responsive questions. According to Shadish, Cook and Leviton (1991), this approach is epistemologically humble with an openness to new ways and a scepticism toward any single perspective claiming to provide superior information.

Inherent contradictions, when integrating multiple paradigms in a single study, however, present a major challenge for the research community. From a positivist perspective (Campbell, 1969), this approach is resource intensive and yields too broad a focus. For critical theorists (Merideth, 1994; Poland, 1996; Robertson & Minkler, 1994), however, this approach is typically too narrow to adequately examine social, economic, historic, political and cultural factors influencing a phenomenon. A popular approach, therefore, is to operate within a single paradigm and to adhere rigorously to established criteria

for quality research. To overcome these barriers typically requires researchers to be predisposed, enabled and reinforced in their efforts to think critically and to apply skillfully an eclectic approach to research a phenomenon. Glanz, Lewis and Rimer (1990) urged that health education is, by its very nature, eclectic. It is strengthened by being inclusive rather than exclusive.

For the purpose of this study, research was situated from a post-empiricist perspective to study the phenomena of post-educational application. Intervention and data collection strategies, consistent with multiple epistemologies, however, were employed to empower participants individually and collectively for exercise behaviour change. For example, from a post-empiricist perspective, data were gathered from instrumentation in a quasi-experimental design to make comparisons and infer causal effects. From an interpretative perspective, data were gathered pertaining to the meaning and purposes subjects attached to their post-educational experiences (Denzin and Lincoln 1994). In addition, the dual role of researcher/implementer and social context clearly influenced all phases of the research process. The researcher's perspective is not only grounded in extensive implementation experience, but is also politically and socially ethical and moral in a system of pluralistic interests. From a critical perspective, an implicit aim of this research project was to raise the level of critical consciousness and to mobilise a

workplace community to engage in collective as well as individual, self-directed health behaviour change strategies. As part of the intervention processes, findings from this study were shared and implications discussed with members of the workplace community. It is assumed, therefore, that judgements made from these research findings are not value-free.

Post-educational application and the construction of social reality has been presented as a value-laden endeavour. An eclectic approach to this process thus recognises the difficulty of making universal knowledge claims about the nature of the human condition. Integrating the art, science and politics of research, therefore, provides a more complete understanding of post-educational application.

Subject Population

The worksite Lifestyle Skills Motivation program was offered to employees in the Department of Housing and Conferences at the University of British Columbia (see Table 6). This department employs approximately two-hundred-fifty people in multiple sections located around campus. A total of four courses were provided to various sections within this department. Employees registered for the program on a voluntary basis. Two specific sections, located within one kilometre of each other, were chosen to act respectively as

Table 6. Demographic Data of Subjects in the Experimental and Waiting-list Control Group

DEMOGRAPHICS	EXPERIMENTAL N=26	N.T.CONTROL N=22
AGE(mean, range)	33 (26-44)	31 (23-41)
SEX	85%F., 15% M.	100% F.
MARITAL STATUS		
Married	14	7
Div. / Sep. / Wid.	4	2
Single	8	13
NUMBER OF CHILDREN		
No Children	9	15
One Child	10	5
Two or More	7	2
EDUCATION / OCCUPATION		
Years(mean, range)	13(10-15)	13.8(12-15)
ETHNICITY		
Canadian	18	18
Chinese	4 **	1 *
Australian	1	0
E.European	0	1
British	2	1
S. American	1	0
E. Indian	0	1 *

* = Born in Canada

an experimental and a 'waiting-list' control group. Distance
helped to prevent possible contamination between subjects
from both groups. Ideally, subjects in a no-treatment
control group consist of multiple units comparable to the
treatment group in composition, disposition and experience.
Chi-square analyses revealed that the groups differed
significantly in the number of subjects who were single
(Chi-Square value 9.37) and the number of subjects who had
children (Chi-square value 5.32). This bias, however, was in
a conservative direction in favour of the waiting-list
control group. Table 6 indicated that despite minor
differences between the two groups in demographic
characteristics, there were no specific circumstances to
suggest that employees from these two sites within the
Department of Housing and Conferences(UBC) differed
significantly. Subjects were clerical staff with varying
levels of rank and responsibility and were aged between 23
and 44 years old. With the exception of four males in the
experimental group (15%), subjects were predominantly female
with the majority of these being not single and with
children. Over three-quarters of the subjects were born in
Canada.

Participation in health promotion programs has been
defined in various ways in the literature. In a
comprehensive review of participation in workplace health
promotion programs, Glasgow et al. (1993) suggested that a
reasonable measure could be based on a requirement of

attending 50% or more sessions of a worksite program. Criteria for data analysis in this study were that subjects attended at least four sessions (50%) of the Lifestyle Skills Motivation program, were not in the "maintenance" stage of exercise participation (as defined by Marcus et al., 1992), and did not have any predisposing illness or injury.

Thirty-five subjects (76%) at the site of the experimental group registered for the intervention. Of those, 29 attended the program and 26 completed four or more sessions. Twenty-seven subjects (72%) at the site of the waiting-list control group completed pre-test questionnaires. Two of these subjects, however, were in the maintenance stage of exercise participation and three subjects had left the department by post-test data collection. Thus, 26 subjects in the experimental group and 22 subjects in a waiting-list control group were considered participants of a purposeful sample in this study.

Interviews were conducted to examine reasons why some participants did not attend the program and why some did not attend more than four sessions. It appeared from a variety of direct and indirect sources that those people who did not attend the program were generally in the precontemplation or maintenance stage of exercise participation, or were reluctant to engage in discussion with peers regarding health issues. Interestingly, these subjects were mainly situated at one work area within this section of the

department. Furthermore, the department representative involved in program development was unable to attend the program as a result of work commitments and vacation timing. Out of a total of eight sessions, half of the respondents attended seven or more sessions, nearly one half attended 6 sessions and the remaining person attended 5 sessions. Reasons given for non-attendance included: "no cover at the workstation, sick, completely forgot, a rush of work that needed doing, taking personal holiday leave." Those subjects who did not attend four or more sessions (n=3) cited time, an ear infection and vacation time factors as barriers to participation. One participant, however, asserted that three particular sessions (the first, the last and one on mental skills) best suited her needs.

Design

The purpose of this study was to gain a better understanding of the effects of, and the application of learning following a worksite health promotion program. Data were gathered on the following concepts and measures:

(1) selected outcome variables (exercise self-efficacy, stages of exercise behaviour change and exercise behaviour),

(2) factors affecting post-educational application,

(3) the process of post-educational application, and

(4) alternative post-educational outcomes,

A field experiment was conducted to address the first research question with respect to key outcome variables. Program evaluation, journal entries and interview data were assessed to help interpret the quantitative data as well as address the second, third and fourth research questions regarding factors, process and alternative outcomes pertaining to post-educational application.

<u>Combining quantitative and qualitative methods</u>

Qualitative and quantitative tools were combined to study the complex and multifaceted process of post-educational application. An eclectic set of quantitative and qualitative tools reduces the uncertainty on single study evaluations without aspiring to total certainty (Cronbach et al., 1980; 1986a). The weaknesses of one approach are thus balanced by the strengths of the other. For example, a quantitative component allowed high accessibility to data sources, enabled a high degree of standardisation to data sources and provided useful comparative data pertaining to evidence of change over time. Qualitative methods, in contrast, provided a dynamic quality to deal with complex and interrelated knowledge about multiple variables related to the experience of post-educational application. Furthermore, the ability to make thought processes and circumstances explicit provided a rich description to understand application from multiple perspectives (Cameron & Taylor, 1996). The literature suggests various ways to integrate quantitative and qualitative methods (Creswell, 1994; Steckler, McLeroy,

Goodman, Bird, & McCormick, 1992). For the purpose of this study, qualitative methods were employed to help explain quantitative findings as well as used in parallel to assess factors influencing application and the process of application.

Figures 4a and 4b capture the design of this study in terms of intervention and data collection processes.

PRE- TEST	**POST- TEST**	**FOLLOW- UP**	**DISSEM. RESULTS**
(May – Oct) 1995	(Oct) 1995	(Nov – Jan) 1995 / 96	(May 1996)

Phone/Site Visit
PRECEDE PLANNING
Learners &
Worksite Officials

    Quantitative
    Outcome
    Variables

    INTERVENTION
    Formative
    Evaluation

        Summative
        Evaluation

        Quantitative
        Outcome
        Variables

Figure 4a.   **Intervention and Data collection processes Over the Twelve Month Study**

PRE-TEST	POST-TEST	FOLLOW-UP	DISSEM. RESULTS
(May – Oct) 1995	(Oct) 1995	(Nov – Jan) 1995 / 96	(May 1996)
		Workplace Wellness Board Activities & Networking	
		Generic E-Mail Weekly Reminders & On-Site Visits	
		Post-Ed. Journal Entries	
		Post-Program Evaluation Questionnaire	
		Questionnaire Outcome Variables	
		Phone/Site Visit PROCEED FACTORS Learners & Worksite Officials	
			Results Dissemination to Workplace Community

Figure 4b.   Intervention and Data collection processes Over the Twelve Month Study

Professionals in the field identify the difficulty of applying rigorous scientific standards in the workplace as a barrier to evaluation (Johnston, 1991). Randomised designs

to identify comparisons and infer causal effects are often not feasible in field settings due to the cost, complexity, delay and prohibitiveness in organisational environments. Campbell and Boruch (1975), however, identified the following biases that tend to operate in pre-test, post-test non-equivalent groups designs that cannot be adjusted by statistics: regression artefacts due to matching, differential growth rates, reliability increases over time due to maturation, advantaged control groups, and ceiling and floor effects. In this study, for example, non-randomisation of subjects from the workplace population to experimental or control groups substantially reduces the potential to make confident generalisations from the sample population to broader workplace populations (external validity). This can be illustrated by the potential bias for members of either the experimental or waiting-list control group with respect to body composition and/or the number of children a person has. These factors are likely to interact with intervention processes significantly to effect exercise behaviour (Bouchard et al., 1990). Compounding the problem of non-randomisation, non-random assignment of treatment to groups reduces confidence to infer causality from the intervention (internal validity) since one group could have been more receptive to program processes than another. At the request of management, the intervention was implemented initially at central office where publicity and promotion for the health promotion program was most prevalent.

Quasi-experimental designs have been successfully implemented in field settings and facilitate causal explanation and generalisation (Cronbach et al., 1980). For the purpose of this study, a non-equivalent control group quasi-experimental design was used as well as priority given to interpretative and critical inquiry to gain a better understanding of contextually-bound post-educational application of a worksite health promotion program. Figure 5 depicts the design of this study based on Campbell and Stanley's (1963) perspective of experimental design.

PRE TEST		POST TEST	FOLLOW-UP	
O	Xe	O	O	
O		O	O	Xc

O = Observations
Xe = Experimental Intervention
Xc = N.T. Control group - Post-study Intervention

Figure 5.   Diagram Illustrating a Non-Equivalent Control Group Quasi-Experimental Design

Procedures

Planning phase

A needs assessment was conducted at both sites between January and October 1995 using a variety of sources as part of an on-going process throughout the Precede planning phase. Multiple methods were employed to recruit subjects

and to ensure that the program was tailored to suit the
needs and circumstances of those involved in the worksite
Lifestyle Skills Motivation program. A series of
interactions occurred between the researcher and worksite
personnel including researcher observations and perceptions,
an informal needs assessment survey, brief but frequent site
visits, brief telephone interviews with management, unions
and employees, focal group meetings with employee
representatives and potential program participants, an oral
presentation of program processes, distribution of
promotional literature and a series of workplace newsletter
articles describing the rationale and processes within the
worksite Lifestyle Skills Motivation program. Workplace
records regarding previous workplace health promotion
initiatives were not available for examination.

Program phase

The worksite Lifestyle Skills Motivation program
involved eight, one-hour sessions. Two sessions were given
per week for a one-month period. Table 7 indicates the
course outline for the eight sessions.

**Table 7. Course Outline for the Worksite Lifestyle
Skills Motivation program**

Session (1)   Introduction, Motivation for Active Living

Session (2)   Fitness Monitoring and Active Living

Session (3)   Weight Management and Active Living

Session (4)   Tension Control and Active Living

Session (5)   Planning Strategies for Active Living

Session (6)   Mental Skills Strategies for Active Living

Session (7)   Evaluation Strategies for Active Living

Session (8)   Applied Motivation Strategies & Active Living

Two intervention programs were offered on each day,
before and after lunch, to accommodate shift-work
requirements of all clerical employees in the experimental
group. The intervention program was held during the month of
October 1995, in multiple and often last-minute venues
located around the workplace environment. On completion of
the four-week program, program support activities continued
to be available for program participants. These included
weekly on-site visits by the course instructor, generic e-
mail reminders to complete weekly journal entries, a six-
week post-program evaluation and workplace wellness board
activities with networking opportunities.

Essentially, a 'no treatment' control group showed what might have happened to respondents in the absence of the program. A 'waiting-list' control group can be problematic since members may be less motivated or may overcompensate in their response to the perceived benefits from an inferior service. To compensate for this, the 'waiting-list' control group was offered an opportunity to take the Lifestyle Skills Motivation program on completion of the follow-up period (January, 1996).

<u>Research phase</u>

Data were gathered throughout the four-month investigation period (October, 1995 to January, 1996) to gain a better understanding of post-educational application following the worksite Lifestyle Skills Motivation program. Data from program evaluation questionnaires were collected at mid-program, post-program and at six weeks following the program. A random sample of 50% of program participants was selected to gather specific data pertaining to post-educational application. Journal entries were collected on a four-weekly basis from completion of the program to a three month follow-up. At follow-up, subjects were contacted by telephone or through on-site visits for a semi-structured interview. In some cases multiple mini-interviews were conducted as a result of participant work commitments and interruptions. An initial telephone call was made prior to the interview to prepare the respondent for questions pertaining to post-educational application. The interview

was semi-structured in nature and lasted from 15-45 minutes. The researcher asked each participant to be as honest and forthright as possible to enhance future programs. Journal entries served as a stimulus for specific questioning and further probing. The questioning format was cyclical rather than linear. This enabled continuous opportunities to cross-check responses as well as to clarify agreement with interpretation. The researcher made faithful and rigorous notes during the interview and then thanked each respondent for his or her time and co-operation. On completion of the interview, a detailed recall was conducted to expand and clarify notes that had been taken. Data were also gathered from interviews with senior workplace management officials to obtain their perspectives regarding implementation processes and outcome perceptions. As a continuous part of the intervention processes, findings and implications from this study were recycled back to subjects involved in the worksite Lifestyle Skills Motivation program.

Instruments

A variety of quantitative and qualitative tools were employed in this study to address the research objectives and to gain a better understanding of post-educational application of a worksite health promotion program.

Objective 1: Selected Outcome Variables

(a) 7-Day Recall Exercise Behaviour Questionnaire.
There are various methods to assess levels of exercise

behaviour, from direct observation, which is objective but very expensive and impractical, to respondent recall questionnaires. In a review of the questionnaires that measure leisure-time physical activity, Lamb and Brodie (1990) concluded that the selection of the most appropriate instrument is often based on a trade-off between practical, financial and quality considerations. For the purpose of this study, exercise behaviour was measured using the 7-Day Recall Exercise Behaviour Questionnaire developed by Godin and Shephard (1985). This is a relatively simple questionnaire that presents a minimal burden to the respondent (see Appendix B). It included a range of activities, categorised by intensity, and subjects indicated the number of times per week that they participated in any of the activities for longer than 15 minutes during the previous seven days. This provided a measure of total exercise participation in terms of type, frequency, intensity, and duration of exercise participation. The questionnaire was validated using measures of aerobic fitness and the reported test-retest reliability was 0.74 (N= 58, p < 0.001). Research has shown that self-report questionnaires are a valid method to assess general patterns of exercise behaviour and to distinguish between those who exercise and those who do not (Blair et al., 1989, Gionet & Godin, 1989, Miller, Freedson, & Kline, 1994).

(b) <u>Exercise Self-Efficacy Scale.</u> Exercise self-efficacy was measured using the Exercise Self-Efficacy Scale that was

developed by Marcus et al. (1992). This questionnaire was developed using the guidelines suggested by Bandura (1977) and is composed of five items that reflect the respondent's beliefs in his or her capability to continue exercising successfully in the face of potential barriers (see Appendix B). The items represent the most meaningful exercise self-efficacy factors that were found and validated by Sallis et al. (1988), namely, resisting relapse and making time for exercise. A 7-point Likert scale, from 1 not at all confident to 7 very confident is used to rate each of the five items. Subjects can also choose 0, "does not apply to me". This questionnaire was used in the study by Marcus et al. (1992) and the test-retest (product moment) reliability was reported to be 0.9 (N = 20, p < 0.001)

(c) Stages of Exercise Behaviour Change Scale. This scale was developed along the guidelines suggested by Prochaska and DiClemente (1985) and adapted for exercise participation by Marcus et al. (1992). This is a five item questionnaire (stages of Precontemplation, Contemplation, Preparation, Action and Maintenance) where one rates each item on a 5-point Likert scale, with 1 indicating strongly disagree and 5 strongly agree (see Appendix B). Stage of exercise behaviour change was thus determined by noting the stage with the highest value recorded. This scale has a Kappa index of reliability for the stages-of-change instrument over a two-week period of 0.78 (n = 20). According to Fleiss (1981), a value of Kappa above 0.75 indicates strong

agreement. This scale is more robust than the 7-Day Recall Questionnaire and, therefore, was strategically placed before the former questionnaire to assist with more accurate self-reporting of exercise behaviour. This was established by the researcher from findings in a previous study conducted in a community setting (Hubball, 1994).

Objectives 2-4: Post-Educational Application

Green and Kreuter's (1991) Proceed framework was used to gather data pertaining to the multidimensional process of change. This framework takes into account the characteristics of the learner and the context in which the change is expected to occur. There is a growing body of evidence to support the utility of this model in a variety of settings and it has broad implications for many forms of adult education (Mullen, Hersey and Iverson, 1987; Houle, 1992, p.275).

Program participants are one of the most important and accountable data sources (Stufflebeam & Walker, 1983). Data gathered from the learners provides information regarding their reactions to the learning experience, factors affecting application and the process of application, and can yield information regarding unintended outcomes. Formative and summative data pertaining to the learning experience was gathered using the Group Report Reactionnaire and the Post-Program Evaluation Questionnaire (see Appendix C). The Reactionnaire is a session/program evaluation form that was adapted from Gorman (1974). It is an open ended

questionnaire that is intended to develop reflective
teaching and learning experiences. A respondent indicates
his or her reflections regarding the following aspects of
the learning experience: the learner's perception regarding
his or her active involvement in the learning process,
perceived learning outcomes, perceived confidence to apply
learning, presentation of learning experience, and
suggestions for how the session/program could be improved.
The Post-Program Evaluation Questionnaire was adapted from
Kingery, Holcomb, Jibaja-Rusth, Pruitt, and Buckner's (1994)
program processes and self-efficacy evaluation format. No
psychometric properties are reported with this instrument.
The evaluation was administered to all subjects six weeks
after completion of the intervention program and required
respondents to rate the perceived usefulness of various
components of the program toward post-educational
application. Data from these two sources focused on the
interactive process of the learning experience and,
therefore, provided a rich critique of the nature of
classroom processes and program outcome perceptions.
Gathering qualitative information of this nature at mid-
program, post-program and at a six-week follow-up, was not
onerous for program participants.

Journal entries, (see Appendix F) pertaining to the
process of application were examined on a four-week basis
from completion of the program until the three months
following the program. At follow-up, a semi-structured, on-

site or telephone interview (see Appendix D) with program participants and workplace officials was guided primarily by the factors in the proceed framework. According to Denzin and Lincoln (1994), "interviews are situated understandings grounded in specific interactional episodes" (p.353). Respondents were also given an opportunity to discuss alternative outcomes following the worksite Lifestyle Skills Motivation program.

Data Analysis

Objective 1: Selected Outcome Variables

The following research hypotheses were examined through quantitative data.

H1. The experimental group will participate in a higher frequency of exercise behaviour than the waiting-list control group across the duration of this study.

H2. The experimental group will have higher levels of exercise self-efficacy than the waiting-list control group across the duration of this study.

H3. There will be a difference in the pattern of the stages of exercise behaviour change between the two groups across the duration of this study.

Data were analysed using a Systat 5 statistical software program. Data were initially analysed for pre-program group differences. Hypotheses 1 and 2 were then

analysed using a two-way analysis of variance, group (two) by time (three) factorial design with repeated measures on the second factor for each of the dependent variables (exercise behaviour and self-efficacy). The advantages of factorial designs are (1) efficiency, in terms of an analysis of two independent variables (2) control over additional variables, and (3) the study of interaction among independent variables (Hinkle & Wiersma, 1988, p.425).

Hypothesis 3, consisting of nominal data on an ordinal scale, was analysed using a two-way, group by time Chi-square analysis on each of the stages of exercise behaviour change. Nonparametric tests are applied to nominal data when the parametric assumptions of normality and homogeneity of variance are not met. Chi-square statistic is a nonparametric test that is frequently used to compare two or more groups in the analysis of nominal data in which observed frequencies of occurrence are compared with theoretical or expected frequencies (Shavelson, 1988, p.560).

Objectives 2-4: Post-Educational Application

According to Miles and Huberman (1994), "qualitative analysis consists of three concurrent flows of activity: data reduction, data display, and conclusion drawing/verification" (p.10). A random sample of 50% of program participants was selected to provide specific data from journal entries and to be interviewed about post-educational application. Continued debate in the literature

exists with respect to validation of qualitative research (Kvale, 1995, Smith, 1992, Denzin & Lincoln, 1994). Lincoln (1995) advocated "relationality" as central to criteria for qualitative research. That is, research rooted in emerging conceptions of community, shared governance and decision making, and equity. For the purpose of this study, quality of data was ensured throughout the interview process by cyclical or cross-checking questioning techniques and multiple opportunities for researcher-respondent summarisation and clarification. Extensive triangulation between journal entries, program evaluations, researcher experience (Patton, 1980), field notes and quantitative data were employed with all qualitative data. Data from program evaluation questionnaires, journal entries and interview notes were then analysed for common or isolated experiences, repetition, themes, intent, contradictions and discrepancies. Concepts were categorised and described within the factors of the Proceed framework. To provide a meaningful understanding and interpretation of data, each factor was analysed in terms of the majority and minority of responses to particular issues. Qualitative data reported in the next chapter reflect the responses from a cross-section of respondents to particular issues that emerged. Data quality in this study was considered to be good.

The findings of this study were integrated, analysed, interpreted, and discussed with respect to the literature pertaining to critical self-directed learning for exercise

behaviour change following a worksite health promotion
program. The findings and implications of this study were
discussed in an open forum with participants from the
worksite community. The results of this study are reported
in the following chapter.

CHAPTER 4

RESULTS

Introduction

This chapter includes a quantitative and qualitative analysis pertaining to application of critical self-directed learning for exercise behaviour change. The chapter begins by presenting a quantitative analysis of key outcome variables in the exercise adherence literature (exercise behaviour, exercise self-efficacy and the stages of exercise behaviour change). Each dependent variable was analysed separately with respect to both groups (experimental and waiting-list control). The dependent variable was initially analysed for pre-program group differences and descriptive data were recorded regarding the group mean scores at pre-program, post-program and at the three-month follow-up. These mean scores were then analysed using a two-way analysis of variance, group (two) by time (three) factorial design with repeated measures on the second factor and appropriate post-hoc analyses. A Chi-square analysis was performed on the stages of exercise behaviour change data. The chapter closes by presenting process, journal and interview data pertaining to multiple factors influencing application, and post-educational experiences following the worksite health promotion program.

Quantitative Analysis

7-Day Recall of Exercise Behaviour

Data were collected for the subjects in both groups with respect to exercise behaviour using the Godin and Shephard (1985) questionnaire. These data were recorded at pre-program, post-program and at a three-month follow-up period. The mean exercise behaviour levels at these data collection points are displayed in Table 8. These results were then analysed using repeated measures analysis of variance. A summary of the ANOVA can be seen in Table 9.

Table 8. The Mean 7-Day Recall Exercise Behaviour (Frequency) for Both Groups at Three Points in Time

GROUP	PRE-TEST	POST-TEST	FOLLOW-UP	MEAN
Experimental	1.9	2.9	2.5	2.4
SD	(1.7)	(1.6)	(1.3)	
N=26				
N.T.Control	2.4	2.2	1.8	2.1
SD	(2.1)	(1.9)	(1.7)	
N=22				
MEAN	2.2	2.6	2.3	2.3

Table 9.   Summary of the Analysis of Variance Comparing the Groups for Exercise Behaviour (N=48)

EFFECT	<u>df</u>	F	* p
Group	1	0.31	0.58
Time	2	0.93	0.40
Group X Time	2	3.58	0.03

* alpha = 0.05

* Repeated measures ANOVA violation of assumptions: non-random assignment of both individuals to group and treatment to group. Two-way analysis of variance, however, is robust to the violations of assumptions, particularly when population variances in all cells are equal and there are equal number of observations in each cell of the factorial design (Hinkle & Weisma, 1988; Shavelson, 1988). Research suggests that when the largest variance in a factorial is less than four times the smallest variance (as found in this study), the ANOVA is most likely to be valid (Wilcox, 1987; Winer, 1971).

Figure 6. Mean Exercise Behaviour (Frequency Per Week) and Mean Exercise Self-Efficacy for Both Groups as a Function of Time

Pre-Program Group Differences

An independent t-test was performed to test for group differences in the pre-test mean scores for exercise behaviour. The results indicated than the means (1.9 and 2.4) were not significantly different.

Two-way analysis of variance (Exercise Behaviour)

Group Effect

Statistical analysis $F(1,43)$ = 0.31 p=0.58 indicated that the mean values (2.4 and 2.1 times per week) of exercise frequency for the different groups (when averaged over time) were not significantly different. The mean exercise frequency score for the experimental group was 15% higher than the mean exercise frequency score for the waiting-list control group from pre-program to follow-up.

Time Effect

Statistical analysis $F(2,86)$ = 0.93 p=0.40 indicated that the mean values for the three points in time (2.2, 2.6 and 2.3 times per week), when averaged over both groups, were not significantly different from each other.

Interaction Effect

Statistical analysis $F(2,86)$ = 3.57 p=0.03 indicated a significant interaction between group and time factors. The response patterns for each group across the time factors were different. Figure 6 illustrates a very small difference

between the groups initially at pre-test (0.45 times per week) in favour of a higher score for the waiting-list control group. On completion of the four-week program, however, the difference between the groups had increased in magnitude (0.74 times per week) and also a directional shift in favour of a higher score for the experimental group. The experimental group participated in exercise approximately one third more frequently per week than the waiting-list control group at the end of the four-week program. From post-program to follow-up the groups tended to converge slightly and showed a decrease in exercise behaviour from post-program to the follow-up period. The difference between the groups at the follow-up period was 0.68 times per week. The mean exercise frequency for the experimental group was 36% higher than the waiting-list control group at the follow-up.

The Scheffe post-hoc comparison test was carried out on the interaction effect. Tobs is the test statistic for the Sheffe method. The Scheffe analysis indicated that the mean differences between the experimental and the waiting-list control group at the pre-program and post-program period (0.45 and 0.74) and also at the pre-program and follow-up (0.45 and 0.68) were significant Tobs(1,86) = 2.19 $p<0.05$ and Tobs(1,86) = 2.10 $p<0.05$ respectively. Looking at the graph in Figure 6, one can see that although both groups tended to decrease from post-program to follow-up levels, the experimental group maintained a higher frequency of exercise than the waiting-list control group. This suggests that the intervention

program was effective in terms of improving exercise adherence.

Exercise Self-Efficacy

Data were collected for the subjects in both groups with respect to exercise self-efficacy. These data were recorded at pre-program, post-program and at three-month follow-up. The mean exercise self-efficacy scores for these points in time are displayed in Table 10. These results were analysed using repeated measures analysis of variance. A summary of the ANOVA can be seen in Table 11.

**Table 10. The Mean Exercise Self-Efficacy Scores
            for Both Groups at Three Points in Time**

GROUP	PRE-TEST	POST-TEST	FOLLOW-UP	MEAN
Experimental SD N=26	19.69 (6.11)	25.81 (4.81)	26.40 (4.36)	23.97
N.T Control SD N=22	21.64 (7.11)	22.00 (7.29)	19.82 (6.69)	21.15
MEAN	20.40	24.20	23.54	22.56

Table 11. Summary of the Analysis of Variance
Comparing Both Groups for Exercise Self-Efficacy

EFFECT	<u>df</u>	F	* p

Group	1	3.48	0.069
Time	2	12.70	<0.001
Group X Time	2	19.07	<0.001

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* alpha = 0.05

* Repeated measures ANOVA violation of assumptions: non-random
assignment of both individuals to group and treatment to
group. Two-way analysis of variance, however, is robust to
the violations of assumptions, particularly, when population
variances in all cells are equal and there are equal number
of observations in each cell of the factorial (Hinkle &
Weisma, 1988; Shavelson, 1988). Research suggests that when
the largest variance in a factorial is less than four times
the smallest variance (as found in this study), the ANOVA is
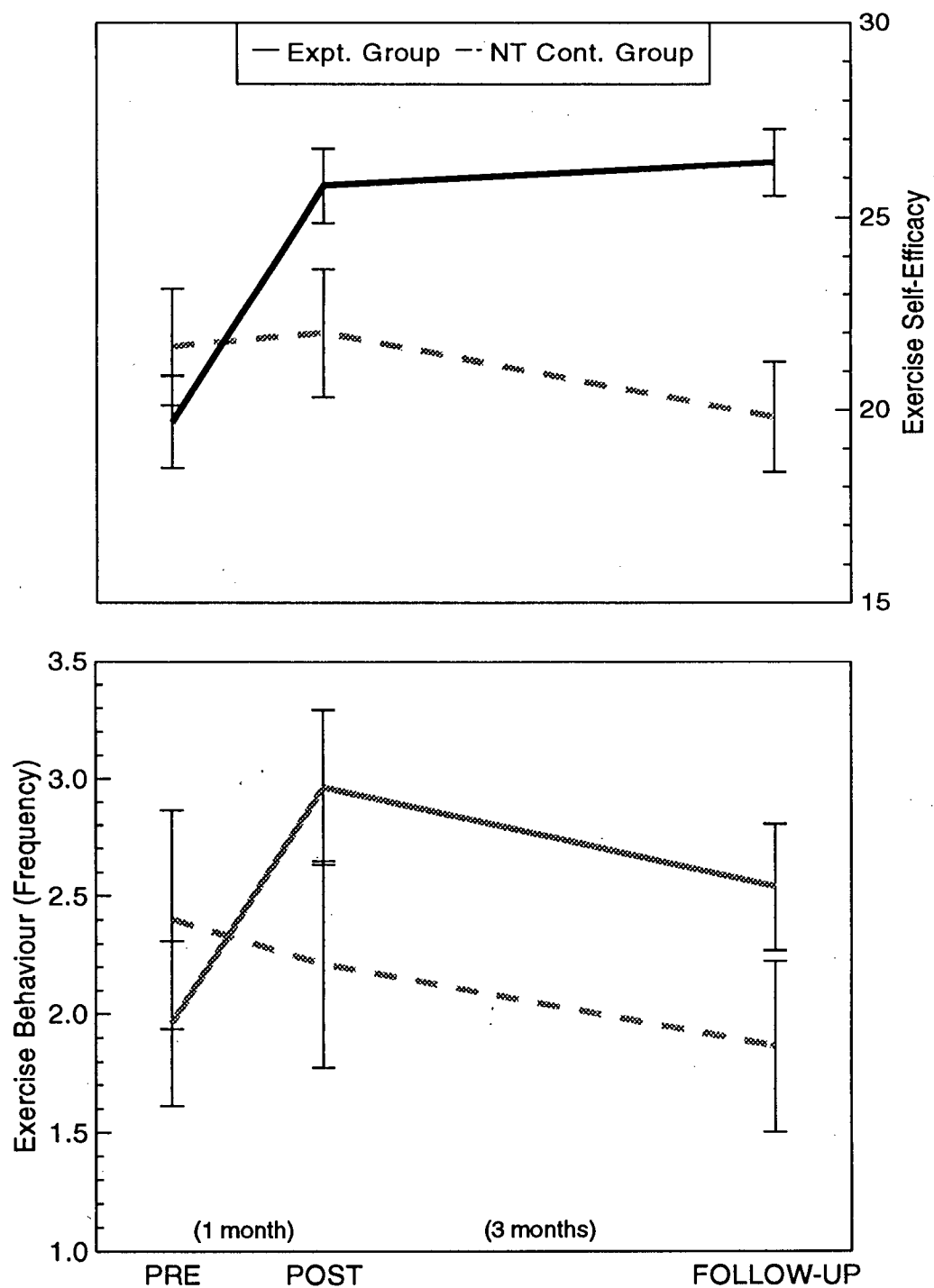most likely to be valid (Wilcox, 1987; Winer, 1971).

Pre-Program Group Differences

An independent t-test was performed to test for group
differences in the pre-test mean scores for exercise self-
efficacy. The results indicated than the mean exercise self-
efficacy scores (19.69 and 21.64) were not significantly

different. These mean scores were comparable to those reported by Marcus et al. (1992) for 429 male and female government employees.

Two-way analysis of variance (Exercise Self-Efficacy)

Group Effect

Statistical analysis $F(1,43) = 3.48$ $p=0.07$ indicated that the mean exercise self-efficacy scores for the two groups when averaged over time (23.97 and 21.15 respectively) were approaching significance. The mean self-efficacy score for the experimental group was 13% higher than the mean self-efficacy score for the control group.

Time Effect

Statistical analysis $F(2,86) = 12.70$, $p<0.001$ indicated that the mean exercise self-efficacy scores for three points in time (pre-program = 20.4, post-program = 24.2 and follow-up = 23.54) when averaged over both groups were significantly different from each other. Looking at these means, one can see a greater increase from pre-program to post-program, than between post-program to follow-up. This may suggest that the increase was largely attributable to the concurrent influence of the intervention program and that continued increase in self-efficacy slows or halts after the exposure to the program ends. The decline from post-program to follow-up suggests that averaged over both groups no further development of self-

efficacy took place. A Tukey pairwise comparison test was carried out to see where the differences occurred in the main time effect while maintaining the experimental alpha level (0.05) at the pre-established level. Q is the test statistic for the Tukey method. The Tukey post-hoc analysis indicated that a significant difference occurred for both groups between pre-program and follow-up $Q(3,86) = 6.69$, $p<0.01$ and between pre-program and post-program $Q(3,86) = 8.09$, $p<0.01$). Therefore, when averaged over both groups, the exercise self-efficacy scores significantly increased from pre-program to post-program, however, there was not a significant difference from post-program to follow-up where a levelling off occurred.

Interaction Effect

Statistical analysis $F(2,86) = 19.07$ $p<0.01$ indicated a significant interaction between group and time factors. The response patterns for each group across the time factors was different. One can see from the graph in Figure 6 that the experimental group tended to increase in self-efficacy whereas the waiting-list control group tended to decrease over the same time period. Initially, at pre-program a small (nonsignificant) difference exists between the groups (1.94) in favour of the waiting-list control group, and then at the end of the four week program, the difference between the groups had increased in magnitude (3.81) and also a directional shift in favour of the intervention program. From post-program to the follow-up period, the groups continued to

diverge with the experimental group continuing to improve slightly while the waiting-list control group showed a decline to below pre-program levels. The mean exercise self-efficacy score of the intervention group at follow-up was 33% higher than that of the waiting-list control group.

The Scheffe post-hoc comparison test was carried out on the interaction effect. The Scheffe analysis indicated that the mean differences between the experimental and the control group at the pre-program and the post-program periods (1.94 and 3.81 respectively), at the pre-program and follow-up (1.94 and 6.59 respectively) and also at post-program and follow-up were significant Tobs(1,86) = 4.23 $p<0.01$, Tobs(1,86) = 6.40 $p<0.01$ and Tobs 2.04 $p<0.05$ respectively. The graph in Figure 6, shows that the experimental group maintained self-efficacy from post-program levels whereas the control group decreased in self-efficacy levels by approximately 10% between post-program and follow-up. Therefore in terms of exercise adherence, it would appear that the experimental program was effective for increasing exercise self-efficacy during the intervention period and at least maintaining exercise self-efficacy for a three-month period following the intervention.

Correlation Matrix

The Pearson-product moment correlations quantify the relationship between the 7-day recall of exercise behaviour and exercise self-efficacy. The moderately high correlations found in this study (Table 12) between exercise frequency and

Table 12.   Pearson Correlation Coefficients for Exercise
             Frequency and Exercise Self-Efficacy as a
             Function of Time

	FREQ1	FREQ2	FREQ3	SE1	SE2	SE3
FREQ1	1.00					
FREQ2	.46	1.00				
FREQ3	.44	.45	1.00			
SE1	.78	.54	0.40	1.00		
SE2	.63	.57	0.65	.75	1.00	
SE3	.28	.33	0.67	.36	0.75	1.00

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* N = 45

FREQ1 = Pre-program exercise frequency.

FREQ2 = Post-program exercise frequency.

FREQ3 = Follow-up exercise frequency.

SE1   = Pre-program exercise self-efficacy.

SE2   = Post-program exercise self-efficacy.

SE3   = Follow-up exercise self-efficacy.

---

exercise self-efficacy at each time period (0.78, 0.57, and
0.67 $p<0.01$) supported the findings by McAuley and Jacobson
(1991) that self-efficacy appears to be correlated with
exercise participation. For the duration of this study, it
would appear from the temporal relationships of correlation
coefficients in Table 12, that exercise self-efficacy

correlations with frequency of exercise behaviour are higher
than frequency correlations with subsequent frequency of
exercise behaviour. However, exercise self-efficacy
correlations with frequency of exercise behaviour are
generally lower than exercise frequency correlations with
exercise self-efficacy, and exercise self-efficacy
correlations with subsequent exercise self-efficacy. These
data suggest, therefore, that participation in exercise tends
to increase exercise self-efficacy, more than exercise self-
efficacy tends to increase participation in exercise
behaviour.

Stages of Exercise Behaviour Change

Table 13a indicates the frequency of subjects from each
group at pre-program, post-program and follow-up in the
contemplation, preparation and action stages of exercise
behaviour change. Subjects volunteered to participate in the
eight-session, workplace health education program hence were
unlikely to be in the precontemplation stage of exercise
behaviour change. Furthermore, data from subjects in the
maintenance stage of exercise behaviour change were screened
and eliminated for purposes of data analysis. An item on the
stages of exercise behaviour questionnaire assessed relapse
history with respect to regular exercise. Data indicated that
80% of the experimental group, and 73% of the waiting-list
control group had experienced some history of relapse from
regular exercise. Table 13b indicates the number of

Table 13a. **Frequency of Stages of Exercise Behaviour Change for Both Groups at Pre-, Post-Program and Follow-up Periods**

	EXPERIMENTAL (N=26)			NT CONTROL (N=22)			
	C	PREP.	A	C	PREP.	A	
PRE-PRO.	8	16	2	6	15	1	
POST-PRO.	3	15	8	8	10	1	*
FOLLOW-UP	3	18	5	9	12	1	

C   = I currently do not exercise, but I am thinking about starting to exercise in the next 6 months (contemplation stage).

PREP. = I currently exercise some, but not regularly (preparation stage).

A   = I currently exercise regularly, but I have only begun doing so within the last 6 months (action stage).

*   = Missing data

**   = Regular exercise refers to moderate leisure-time physical activity 3 or more times per week for 20 minutes or more each time.

Table 13b. **Individual Change in Stages of Exercise Behaviour for Both Groups Between Pre- and Post-Program, and Between post-Program and Follow-up Periods**

	Pre-Program to Post-Program	Post-Program to Follow-up	Pre-Program to Follow-up
Exp. Gp. (N = 26)	C > P = 5 P > A = 3	P > A = 2 P < A = 5	C > P = 5 P > A = 3
NT C. Gp. (N = 22)	C > P = 1 C < P = 3	C < P = 2	C > P = 3 C < P = 6

C	=	Contemplation stage
P	=	Preparation stage
A	=	Action stage
>	=	Progressive Change
<	=	Regressive Change
Exp. Gp.	=	Experimental Group
NT C. Gp.	=	No-Treatment Control Group

individuals for each group who reported change in stages of exercise behaviour between pre and post-program, and between post-program and follow-up time periods.

A summary of the Chi-square analysis is shown in Table 14. Chi-square is a continuous distribution. When more than 20% of cells have expected frequencies less than five, the researcher is advised to combine adjacent rows. Furthermore,

Table 14. **Summary of Chi-Square Analysis for the Stages of Exercise Behaviour Change**

Condition	Chi-Square	* p
E (pre) - N.T. (pre)	0.32	>0.05
E (post) - N.T. (post)	4.03	<0.05
E (f. up) - N.T. (f. up)	4.09	<0.05
E (pre) - E (post/f. up)	5.17	<0.05
N.T. (pre) - N.T. (post/f. up)	0.45	>0.05

---

* = alpha, 0.05

E = Experimental group

N.T. = No-Treatment control group

Chi-square calculations for one degree of freedom (e.g., 2 X 2 contingency tables) require an adjustment for continuity using Yate's correction for continuity (Shavelson, 1988). Thus, for Chi-square analysis, data from subjects in preparation and action stages of exercise behaviour change for each group were combined.

The analysis of the <u>pre-program group differences</u> using Chi-square indicated that the calculated value (Chi-square = 0.0025) was less than the critical value (Chi-square = 3.84) and therefore the null hypothesis, which stated that there would be no differences in the pattern of the stages of exercise behaviour change between the two groups at pre-

program, was supported. Thus the distribution of subjects in each group for the stages of exercise behaviour change at pre-program was not significantly different. The analysis of the post-program group differences using Chi-square indicated that the calculated value (Chi-square = 4.03) was more than the critical value (Chi-square = 3.84) and therefore the null hypothesis, that there would be no differences in the pattern of the stages of exercise behaviour change between the two groups at post-program, was rejected. Thus the distribution of subjects in each group for the stages of exercise behaviour change at post-program were significantly different. The analysis of three-month follow-up group differences using Chi-square indicated that the calculated value (Chi-square = 4.09) was more than the critical value (Chi-square = 3.84) and therefore the null hypothesis, that there would be no differences in the pattern of the stages of exercise behaviour change between the two groups at follow-up, was rejected. Thus the distribution of subjects in each group for the stages of exercise behaviour change at the three-month follow-up was significantly different.

Chi-square analyses of the changes from pre- to post-program as well as post-program to follow-up for the experimental group indicated that the calculated value (Chi-square = 5.17) was more than the critical value (Chi-square = 3.84) and therefore the null hypothesis that stated that the pattern of the stages of exercise behaviour change for the

experimental group would not be significantly different from pre- to post-program was rejected. Thus the distribution of subjects in the intervention program from pre- to post-program and to follow-up for the stages of exercise behaviour change was significantly different. In comparison, Chi-square analyses indicated a none significant change for subjects in the waiting-list control group between pre-, post-program and three month follow-up.

These results suggest that differences did occur between the two groups with respect to the stages of exercise behaviour change at post-program and at the three-month follow-up period. On the whole, more people from the experimental group progressed from contemplating exercise to the preparation, or action stage of exercise behaviour change than did the waiting-list control group.

Summary

Quantitative analyses of this study indicate that significant changes, in favour of an experimental group, occurred in exercise behaviour, exercise self-efficacy and the stages of exercise behaviour change ($p<0.05$). First, the mean exercise behaviour of the waiting-list control group, when taken at three points in time over a three-month period, tended to decrease continually. In contrast, the mean exercise behaviour of the experimental group increased from pre- to post-program before declining at the follow-up period to a level still significantly above that of pre-program exercise

behaviour. Second, the experimental group tended to increase and maintain exercise self-efficacy over the three-month period whereas the waiting-list control group showed a decrease in exercise self-efficacy from post-program to follow-up. Third, subjects in the experimental group tended to progress forward from the contemplation stage of exercise behaviour toward the preparation and action stages of exercise behaviour change than did subjects from a waiting-list control group.

Qualitative Analysis

The author employed a qualitative analysis to the study of application of learning following the worksite health promotion program. Course evaluation documentation, journal entries and a semi-structured interview process were scrutinised through qualitative procedures. Research questions pertaining to the application of learning were guided by Green and Kreuter's (1991) Precede-Proceed framework. The multi-interaction of social contextual, health promotion and individual factors influenced whether and how learning was applied. The following sections are a synthesis of detailed narrative information gathered over a three-month period from a random sample of fifty percent of participants (N=13) who took part in the intervention program.

Factors affecting the application of learning

(1) Social contextual factors

Individuals face an array of complex and dynamic factors in the social environment that can facilitate or hinder application. Nearly three quarters of the respondents described <u>family/social issues</u> as being main factors influencing their participation in exercise. In many cases these issues came before being able to attend to personal needs and included before-and-after-work child care commitments, home-based roles and responsibilities for caring and providing for others, and serious family concerns/problems that tended to render issues of exercise participation as unimportant. For example, comments included,

my sister is going through a tricky divorce right now and she and my two nephews have moved in with us for a while, everyone else's things to do at home seem to come before mine, my [teenage] daughter is having some problems at home and school so I'm worried about her and don't seem to be able to think about much else right now, on top of a full-time job here, my husband and I are also trying to get a business off the ground so we have been channeling all our spare time into this for quite a while now.

Similarly, busy social responsibilities for some single employees, active in voluntary work or sitting on a variety of community committees were also cited as factors that allowed little free time for exercise. Nearly one half of respondents, however, claimed that a social support system from significant

family or workplace colleagues was key to participation in exercise.

Over one third of respondents attributed their inactivity to conditions in the <u>workplace</u>. Comments such as, "increasing workloads, boredom, constant changes... and conflicts to deal with, there's too many unhealthy celebrations... drinks, cakes etc. It's nice but we all feel bad afterwards and it doesn't really help." In addition, nearly one third cited access issues in the workplace as a barrier to exercise. For example, some complained that management had their own changing and showering facilities that were awkward for employees to make use of. This was considered "unfair" and a hindrance for those preferring to jog at lunch time rather than walk or join the Student Recreation Centre (SRC). Others commented that a lack of money prevented them from being able to use specific facilities e.g., "the SRC and fitness club memberships are all right if you can afford it, I wouldn't mind going swimming at lunch times but it's about $5 each time." There was a strong belief among these respondents that staff should be allowed limited free opportunities to attend campus sporting and fitness facilities. In contrast, an equal number commented that the workplace context facilitated exercise participation. For example,

> if it wasn't for the SRC I'm not sure if I'd be able to
> do as much or as regular as I am, flexi-time allows me to
> indulge at lunchtimes on nice days for a long walk...but
> I usually make it up later anyway, well if you can't

enjoy the walks around this place where can you?, to be able to drive to the beach at lunchtimes, if I feel like it, is just great, I feel reasonably safe around here but I wouldn't go into the trails by myself, it's quite lucky to have all these gardens, mountains and bay views to look at on a walk, when I do go jogging at lunchtimes, I like the [nearby] forest trails because I see enough of buildings and traffic where I live, every now and then I manage a lunchtime swim at the aquatics centre.

Over half of the respondents cited <u>commuting</u> as a barrier to regular exercise. This was variously described as follows:

in order to live in a nice and affordable family home around here invariably means that you have got to spend a long time travelling to and from work each day, I don't get enough time at home as it is without having further time used up after work going for exercise, I'm committed to a car-pool arrangement so we have pretty fixed times to come and go, after a full day at work and being in commuter traffic, exercise is the last thing that I feel like doing, travelling to work takes up most of my free time, I don't like the driving it doesn't make me feel like doing much afterwards.

For many this often meant that the lunch-time period or weekends were the most likely times available to engage in leisure-time physical activity.

Several respondents commented on the ideal <u>Vancouver</u> <u>environment</u> for participating in exercise. In particular,

access to skiing, hiking, tennis, mountain and beach trails.
Nearly one third of respondents, however, cited the cold or
rainy Vancouver winter weather as being a key factor in
determining whether lunch-time or weekend exercise was
probable. Further, over one third of respondents who said that
they would like to do more walking activity reported that they
did not feel totally secure by themselves either in secluded
areas or outside of busy daylight hours. Child care
organisation and finding exercise partners with similar
schedules presented a major problem. Some reported getting
around this by using various kinds of home-based exercise
machinery while one person reported having the convenience of
being able to use a fitness room in his apartment complex.

Respondents are thus presented with a myriad of obstacles
in the social environment that can hinder participation in
regular exercise. The cumulative effect of these obstacles
originate from social issues, the community environment, the
workplace environment and the transition between the home and
the workplace were, for some respondents, largely beyond their
personal control. The locus of control was viewed to be
external with family members or significant others surrounding
the workplace context. Significant people who thus influenced
exercise participation in the context of application included:
local community, extended family members, partners, spouses,
off-spring, management, workplace supervisors and colleagues.

(2) Health Promotion Factors

Health promotion factors refer to environmental (e.g., workplace policy, the learning context) and educational (program content, program processes, presentation and perceived learning outcomes) processes that influenced post-educational application.

Sensitive negotiations with senior management personnel, prior to the program, were critical to gain their support and allow the program to take place in work-time, thus, ensuring high participation. Departmental priorities for room bookings, however, typically meant that multiple venues were used throughout the duration of the program. Interestingly this was not perceived as a hindrance by any of the respondents, rather, nearly half of the respondents commented that being in different places located around the worksite added to the "fun" nature of the program. One person who worked in a more isolated workstation, however, made the following remark, "what venue?...we were all over the place." Two people felt that one location would have been more ideal and over one third did not think that the course venue was any kind of issue. Nearly one quarter of respondents expressed appreciation for the effort put in by the instructor to personalise each conference room by displaying previous work on walls to look at, before and after each session, and in rearranging the seating to facilitate group activities and discussion.

The knowledge, attitudes, skills and experiences embedded within the context of educational processes were key factors that influenced application. Nearly one third of respondents commented on the practical value of the course e.g., "we generated our own solutions, useful indoor and outdoor walking routes around Brock, easy to do relaxation skills, made me think about my situation, useful time management tips." Furthermore, over three quarters of the respondents commented on the usefulness of the group interaction throughout the course. Reasons offered included: "sense of support, more enjoyable and motivating, gave it a reality, an informal opportunity to interact with other colleagues that doesn't often arise,...benefit from other peoples' experiences in similar situations." In particular, nearly a quarter of the respondents commented on the usefulness of the initial 'team work challenge' through question and answer format regarding the previous session:

> it was a good way to get our minds onto health and off the job issues that we had just left downstairs, it helped to see the link of it all coming together, it was a good way to liven us up at the start... you were remarkably patient and understanding with us though.

On the other hand, a quarter of the respondents indicated that they would have preferred more discussion opportunities with peers rather than problem-solving activities. Equally, a quarter of the respondents did not feel that the group interaction was particularly useful. These people felt that

the problem-solving activities were too biased toward helping people in early stages of exercise participation rather than those looking for motivational ideas to maintain regular exercise.

The educational experience was generally evaluated by respondents very highly. Examples of such praise included the following comments:

> very professional, well organised, good experience, well worth it, interesting, got a lot of useful tips, thought-provoking...increased my awareness of what I do and what I don't do!, great, very enjoyable, helped me a lot, good balance and variety, nice atmosphere, I liked the fruit idea.

In conjunction with judgements made about the educational experience, the instructor was viewed as being: "highly visible, approachable, inclusive, motivating, challenging, supportive." Over one half of the respondents claimed that they had not attended anything (health promotion program) like this before. In criticism of the educational experience, over three-quarters commented that they thought that each session was too brief and that the program did not continue for long enough. Nearly one third of respondents would have preferred more weight control topics. Nearly a quarter of the respondents, however, asserted that fewer sessions may have been just as effective. These people felt that the program was "too basic" for them. Suggestions included, "a separate course for more advanced people, more formal fitness testing

opportunities, individual consultations." Nearly one quarter of respondents suggested the use of more video materials in the program.

Using guidelines from Kingery, Holcomb, Jibaja-Rusth, Pruitt and Buckner's (1994) program processes and self-efficacy evaluation format, all participants in the intervention program received a program evaluation form to complete at six weeks following the end of the program. Table 15 indicates the mean responses from 0-10, (10=extremely satisfied) pertaining to the perceived usefulness of various components of the program in helping participants to engage in regular exercise. In summary, respondents' generally positive encountering of a uniform educational experience was often perceived differently in terms of the processes and outcomes.

Table 15. Summary of mean scores pertaining to perceived
          usefulness of particular program processes in
          relation to helping participants engage in
          regular exercise

Program Processes	Mean Score
Instructor	8.7
Course Handouts	8.1
Individual, social and contextual factors that influence motivation	7.4
Classroom facility and venue	7.4
Group work and problem-solving	7.3
Planning strategies	7.3
Stress management strategies	7.2
Evaluation strategies	7.2
Mental skills	7.0

(N=20, 77%)

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(3) Individual factors

       The extent to which respondents were predisposed, enabled

and reinforced by individual, educational and social

contextual factors shaped whether and how learning was

applied. Respondents were variously predisposed by

demographics, motives, intentions, knowledge, attitudes and

beliefs to apply learning. The demographic profile of the sample of participants from the intervention group closely matched that of the other fifty percent and also the entire department. Respondents were clerical employees with different levels of rank and responsibility in the Department of Housing and Conferences at the University of British Columbia. One of the respondents was a departmental manager. Respondents were aged between 27-42 years old. Over three quarters were female and over two thirds were married with the majority of these having children at day care or public school. Over three quarters of the respondents were born in Canada. Studies have shown a significant relationship between variations in demographic profile and exercise behaviour (Biddle, 1995, Dishman, 1994, Rudman, 1986). Typically, males and females at the lower end of the socio-economic scale tend to be less active unless employment positions require sustained periods of moderate to vigorous physical activity. Furthermore, employment positions with high demands and low-decision making authority, such as front-desk clerical employees in this study, are more prone to sedentary behaviour and stress-related illnesses (Holt, 1993).

Respondents expressed a variety of motives for attending the workplace Lifestyle Skills Motivation program, including,

it sounded good, to get some motivation ideas, want to improve my health, it looked interesting, I needed to do more active living, I'm interested in anything to do with health, I'd never done anything like this before, I

wanted to get back into regular exercise, pick something up, I was attracted by the topic on mental skills, curious to find out what it was about, anything to do with motivation...I need it!

Respondents came to the course with varying exercise and motivational experiences. Over three quarters of the respondents claimed to have some past, or recent history of participating in a period of regular exercise. According to questionnaire data using Marcus's (1995) stages of exercise behaviour change, nearly one third were in the contemplation stage, nearly two thirds were in the preparation stage and the remainder in the action stage of exercise participation.

Over half of the respondents indicated that the course reinforced what they already knew, in particular, the importance and benefits of exercise, exercise prescription, heart rate monitoring and even knowledge about individual strategies. An equal number commented on the thought-provoking nature of the course with particular reference to increasing self-awareness toward a variety of thoughts, feelings and actions, and also to multiple factors that influence motivation. Over three quarters of respondents commented that the course had helped to increase their confidence to participate in regular exercise. For example, "I go in phases but I know that I can get back into it, I know that I can do more exercise in my situation, I feel good knowing that there's a few more things that I can do." The remaining people felt that their unique situation prevented them from

participating in exercise though once this had changed they did feel more confident that they could do more exercise.

Enabling factors refer primarily to specific skills and barriers that shape application. Nearly three quarters of respondents claimed to be familiar with the topic areas promoted in the course outline, either from sports documentaries or various forms of media and literature sources. At some stage, nearly one third had previously learned similar strategies in child birth and relaxation courses but had not used them intentionally as general or specific motivational strategies. An equal number commented that aspects of their work required various forms of planning and record keeping skills that were inherent in the motivation strategies, and nearly one quarter of the respondents claimed to be compulsive planners and list makers.

In terms of skill acquisition, nearly three quarters of respondents said that they had gained useful social support strategies, an equal number reported acquiring various forms of planning strategies, and over one third claimed to have acquired useful imagery strategies which had helped them or significant others in their efforts to participate in exercise. In contrast, nearly one half of respondents indicated that they were not sure initially what the course topics meant or what they entailed and over one third commented that they could not recall ever doing anything like this before. Nearly one third of respondents stated in some form, that personal planning was not one of their stronger

points and nearly one half of participants felt that more sessions were required before being able to truly master the strategies.

A variety of specific and general barriers were cited by all respondents as key factors that hindered participation in regular exercise. Other than those already reported in social contextual factors (significant others, commuting, workplace and Vancouver environments) nearly one quarter of respondents described lingering health problems such as colds/flu and back pain. One person commented that, "my hunger timer kicks in regular at lunch-time so I don't have the time or feel like doing exercise then." Other barriers cited typically mirrored those prevalent in the exercise adherence literature. For example, <u>fatigue</u>, "I have tried to walk after work but most of the time I am just too tired; <u>self-motivation</u>, I keep meaning to do more but lack will-power, <u>a lack of time</u>, there's never enough hours in the day!" Interestingly, without prompting, nearly all respondents in the following sentence, consistent with course processes, offered various strategies to overcome these barriers.

Respondents were variously <u>reinforced</u> in their efforts to apply learning through individual, social and contextual processes e.g., self-monitoring of thoughts, feelings and actions; feedback from significant others; weekly e-mail reminders to complete exercise diaries and site visits by course instructor; and six weekly post-course evaluation. Furthermore, respondents were generally cognisant of the

wellness representatives and wellness board to help create a healthful workplace community. For example, one person commented, "the wellness board idea helped to keep the momentum going from the course... it often gives us something to talk about in the coffee area too."

The workplace Christmas party was also indicative of course outcomes in that staff decided that an active social gathering at UBC ice-rink would be more beneficial than indulging in excessive food and alcohol. Interestingly, one of the first challenges presented to a wellness representative came from a colleague who wanted to address the issue of access to showering and changing facilities. This was resolved by exploring a variety of options and ensuring that it was permissible to use alternative facilities. Many respondents, however, felt that since Christmas the Wellness Board had been changed too infrequently and was beginning to lose its impact. One wellness representative commented that he was often too busy with other things to remember to change the Board. The other representative commented that, "my section is quite active anyway so it doesn't seem that important."

Respondents were thus variously predisposed with different motives, intentions and levels of self-efficacy for application; enabled by an array of barriers, opportunities and skills from previous or current experiences related to exercise behaviour change; and reinforced through personalised self-reflection and monitoring, social networking and/or

environmental gratification in their efforts to apply
learning.

Summary

Data reflected the varied post-educational experiences of
diverse participants who attended the workplace Lifestyle
Skills Motivation program. Essentially, the multi-interaction
of individual (e.g., motives, intentions, experiences,
critical thinking and self-directed learning skills) health
promotion (e.g., workplace policy, learning venues, workplace
wellness network, instructor facilitation, responsive
programming, social interaction) and social contextual (e.g.,
workplace facilities and social climate, family and social
issues, commuting situation, safety considerations and
opportunities for exercise participation in the setting of
application) factors shaped whether and how learning was
applied following a worksite health promotion program.

Process of Application

Despite the uniformity of the workplace health education
program, learning, in the form of knowledge, attitudes, skills
and behaviours was generally applied in a variety of intended
and unintended ways. The following is a synthesis of
collective accounts regarding how and why learning was applied
in the context of application.

Knowledge

Over one half of the respondents commented that the
course had stimulated them to think critically about exercise

participation. For example, in terms of rigorous thoughts

pertaining to exercise behaviour change,

> I'm a little more conscientious now about thinking
>
> through my day so that I can find some, or a few
>
> opportunities for extra walking, I tend to be more aware
>
> at the weekends about how much exercise I have done in
>
> the week, it [the program] helped get me going and make
>
> my fitness more of a priority... makes me feel good and
>
> prevent heart disease and all that.

Creative thoughts were evident by taking into account

different perspectives and making various connections between

exercise and other related behaviours:

> I'm trying to lose weight too so I've found the
>
> strategies helpful for this too, I'm more conscious now I
>
> think about my thoughts and feelings during exercise...it
>
> helps make it a useful, if not a more enjoyable
>
> experience, just knowing that others want to do more too
>
> and also face similar demands makes it a little
>
> easier...makes you realise that you're not alone and you
>
> don't feel totally useless for not doing it as much as
>
> you should, the usual noise that goes on inside my head
>
> makes more sense now!...I don't feel such an odd-ball and
>
> I didn't realise how useful it can be.

Respondents reported various forms of critically reflective

thoughts about exercise behaviour change.

> I'm more sceptical of fitness products on TV, I think
>
> that UBC could do more for people who work here in terms

of offering limited free swims or use of the fitness
facilities etc, I'm a lot more aware of the influence of
others on my physical activity...well, it often means
that I have to get things going so that we do go for a
walk after supper.

Over one third of the individuals referred to the motivation
strategies as "basically common sense." Nearly three quarters
of the respondents, however, commented that they had not
previously thought of these "things" before as being
collective motivational strategies, which, for a variety of
reasons and to varying degrees added to their personal
resource base. Nearly one quarter of respondents commented
that their increased knowledge about different components of
physical fitness had helped them make connections with their
fitness class and better understand why certain exercises were
being performed.

Attitudes

Respondents' described a variety of ways which helped
their confidence to participate in exercise e.g.,

I try to think more positively about what I <u>can</u>
do...otherwise it's easy to slip into reasons why I can't
do it, setting realistic goals that I am able to
achieve...I know that I'll have something to show for it,
making it enjoyable, by switching off from work or
personal problems...it helps me to keep looking forward
to it the next time I guess, there's a few more people

active around here now...it's something to talk   about,
and, if they can do it, so can I.

Personal commitment, group discussion and problem-solving activities during the course as well as the atmosphere in the workplace environment were cited as key factors that facilitated these beliefs. Over one third commented that they were enjoying walking a little more than they had previously. This was attributed to the confirmation and value placed during the course, on walking as a multi-benefit form of physical activity, cognitive disassociation strategies and also personal and joint commitments that had been made to participate in walking activities.

Skills/Strategies

The process and rationale for the application of particular strategies will be described within the factors of the conceptual application framework.

Social Context

Nearly one half of respondents suggested that networking strategies were useful for them. Respondents' approaches to networking strategies were variously described as joint participation in physical activity (e.g., two or more people walking together) versus individual participation in a group physical activity (e.g., drop-in volleyball), group participation in a physical activity (e.g., belonging to a regular team), lobbying (e.g., discussion and organisation for a workplace Christmas ice-rink party), supporting colleagues with active living intentions, sharing of health intentions

verbally with significant others, mutual sharing of health intentions, and collective health commitments with significant others. For example,

> I tend to share most things with my sister. We are both trying to lose weight right now too... we usually ask how each other is getting on...this helps to motivate me to keep up my walks, well, in the house I'm always going on that we need to spend more quality time together...our evening walks together as a family contribute to this otherwise we end up watching too much TV and regret it, we walk briskly together and talk most of the way so you don't even notice much about the exercise...its more natural I think than some of the other strategies, it's a sort of joint thing we do...its one more thing that helps to keep my daughter and I close.

Others focused on the opportunity to connect with nature or make use of environmental facilities.

> there's a small group of us who make use of the SRC at lunchtimes...it's a general topic of discussion amongst us which helps to keep up the pressure...I don't think that I am disciplined enough to do it regularly by myself, I like to walk at lunchtimes in the nearby gardens. I can see the bay, trees and mountains which all make me feel good.

Negotiation was part of networking strategies. Negotiation experiences could be described on a continuum from autocratic at one end, e.g.,

it can be quite a battle sometimes to get everyone out

[of the house after supper] but sometimes its a case of

switching off the TV and throwing coats at people!...we

sometimes have to try and think of some fun things (tag,

I spy etc) to do along the way otherwise the kids will

get bored easily. They are all grateful afterwards

though...in their own way!.

to democratic on the other, e.g., "we [family] usually plan
weekend activities together and tend to go with the option
that suits the majority unless one of us hasn't had their
choice for a while." Interestingly, the males (n=3) and only
one female tended to engage in solitary physical activity. Of
these, only one male suggested that this experience was shared
verbally with, and was supported through encouragement by a
significant other.

<div align="center">Planning Phase</div>

Connected to networking strategies, nearly one quarter of
respondents felt that communication and negotiation skills
were critical for exercise participation e.g.,

we take it in turns to decide the early morning walk

route otherwise we'd never agree, I have to give them

[family] plenty of warning that we're going for a walk

after supper and let them choose the time so they don't

miss a program or whatever, as part of our routine we'll

often discuss what we need to get from the store which

helps our motivation.

Nearly three quarters of respondents commented that <u>scheduling</u>
<u>strategies</u> were the most useful strategies that enabled them
to participate in exercise. When respondents were asked how
they used scheduling strategies, the following aspects were
noted: (1) goal setting for variety and local circumstances
e.g.,

> developing the walking options around 'Brock' was a good
> idea. I haven't used them specifically but I do have a
> few walking routes around home now which I use depending
> on how much time I have... it adds more variety depending
> on how I feel and is something tangible and challenging
> to get going on, before lunch I think about where I'm
> going to walk based on how I feel and especially with
> this weather it might well be indoors...it helps me to
> build up to it I guess, I usually get up early in the
> morning before the kids and this gives me a chance to
> think about my day and combine a walk to the store, with
> what we need for the house etc.

(2) time management,

> Sunday evenings are usually the time that I plan for the
> week ahead. I just include SRC in capitols on my diary
> and this reminds me on those mornings to pack my exercise
> stuff...it's right there on the diary so I have to do
> it!, making it part of our routine is the only way that I
> can manage to do so many things at once: work, sort
> family out, time with my daughter, look after myself and
> get the groceries!, I usually plan at night-time for the

next day. It's an endless process of juggling multiple priorities...I try to fit in at least one decent walk around whatever else I have to do... it's the only way I can fit in so many things.

(3) stimulus control,

I have "activity" written on a sheet with my other "list of things to do for the day." This is displayed at my work station so it prompts me to have regular stretches, use the stairwell and/or walks at lunch times. If it aint on my 'things to do' list then it would be unlikely that I'd get round to doing it, I guess it's a state of mind really, as the alarm goes off at 6:05 am I just tell myself 'don't think about it, just do it'...it helps to avoid procrastinating.

Some people engaged in continual planning attempts,

I often go over my day in my head in bed in between the alarm going off and getting up...I feel a little more in control over what I end up doing, I often think about the exercise class, what we'll be doing, how to do certain movements, the music etc. This helps me to look forward to it more I guess.

while others opted for more rigid structures,

there are set days and times that I (and others) go the SRC...it's a sort of a discipline for me and takes away my option to think of an excuse, I don't bring all of my lunch to work anymore which makes me walk to the village to buy a drink or fruit etc...I kept meaning to do

something so this makes it more official, I set the alarm for 6:05am and we get straight into our clothes without a wash and out of the house <u>rain</u> or <u>shine</u> before either one of us can say 'maybe not today'! All's it means is that clothes have to be ready...it eliminates will-power worries. One of us usually decides the route as we head down the drive. We go for about 25 minutes which gives us plenty of time to get back, take a shower, have breakfast and off to work...it's a great way to start the day off together.

and some combined flexible and rigid methods of planning,

I tend to be quite mechanical about lunchtimes and purposefully slip into auto-pilot and walk to the village to get my lunch...I go the direct way there and choose from a variety of routes to return...it gives me some time for myself, my weekly routine is fairly stable so lunchtime exercise on Tuesdays and Thursdays and also on Sunday mornings seems to fit in for me. I alternate between a brisk walk, jogging or swimming depending how I feel.

For many respondents, planning typically included a variety of individual, social and contextual strategies. In contrast, nearly one quarter of respondents stated that they didn't have any exercise plan, rather, they based their decision to exercise on immediate feelings or socio-environmental factors (invitations by others, nice weather, 'special days'). These respondents reported that they would

like to do more exercise but felt that exercise planning

strategies were "too rigid," "pressurising," "unrealistic,"

and "took the fun out of it."

<u>Action Phase During Physical Activity</u>

Respondents indicated a variety of coping strategies

during physical activity that helped their motivation to

participate. Nearly one quarter of respondents preferred the

use of a 'walkman' to enhance their enjoyment of the exercise

experience. Those people who typically engaged in brisk

walking described their coping strategies in the following

ways: (1) relaxed and unfocused thoughts,

> I just let my mind wander...I like the freedom that this
> brings for a change rather than having to concentrate on
> reports or files etc, I try and let my brain rest and
> think of nothing...it sort of helps feel like I'm
> balancing things up after working at the desk all day, by
> purposefully switching off from work and having nice
> things to think about helps me to unwind otherwise I end
> up thinking about all of my worries and don't feel
> relaxed after it either!.

(2) social and environmental focusing,

> we talk most of the time...it takes our mind off the
> effort, I prefer to switch off and just look around at
> the bay...I think that there's something spiritual about
> nature that we all need but don't fully understand yet, I
> love the trees around here that's what I mostly look
> at...I like to reminisce. It reminds me of when I was

young growing up on the Island [Vancouver] and the fun we

used to have in the fields, If anything, I concentrate on

the fresh air and the nice feeling of being in the

outdoors.

(3) problem-solving thoughts,

I usually think over something that I'm trying to sort

out...there's not the distractions like at home or work

so it allows me to think more clearly about things,

I like to think about things that I have got to work out

either at home or work when I am walking...I find that my

head is clearer and it helps to work these things out

better.

(4) liberation thoughts,

I enjoy the time to myself to relax and go where I

please, I often say to myself, 'oh, this is the

life'...it's a welcome feeling of space and freedom in

contrast to the usual hassles and confines of work, I

think to myself, 'I deserve this'...I constantly feel

like I am doing things for others so since this course I

decided to try and have a little more time for myself and

my own health for a change.

Interestingly, those people engaged in group fitness

activities described their thought processes in the following

ways:

I just think about the beat of the music and try to keep

my body in synch...it's something to focus on so that I'm

in tune with it all to get a good work-out, I think of

what it will be like in the summer...looking forward to
wearing summer clothes and being on the beach again gives
me a buzz and also a big incentive to do it, depending on
the 'move' [in my fitness class] I try to figure out what
the exercise is doing for me... it makes the session more
interesting, I tell myself to 'just keep going'...it
helps me to keep up the energy, I often fantasise about
being a professional dancer...it gives me a lot more
energy and makes me feel great when I'm doing it.

To summarise, respondents participating in various forms
of physical activity generally engage in an assortment of
verbal, visual, and kinaesthetic imagery and behavioural
strategies. Nearly one quarter of respondents, however, were
not aware of any particular strategy when engaged in physical
activity.

Evaluation Phase

Four major evaluation strategies were reported by
respondents that helped their participation in exercise:
subjective evaluation of the exercise experience, physical
appearance, comparisons made with behavioural patterns of
significant others and personal diary reflections. Nearly
three quarters commented on using an informal subjective
evaluation of the exercise experience e.g.,

I score it between 1 and 10 based on whether or not I had
a good workout...it helps keep the continuity going, I
might think 'how was I today' ... based on what energy I
had...it helps to identify things that influence my

energy levels, I try and think how much better I feel
after having been out in the fresh air and the nice
environment...it helps to reinforce the benefits, I just
have that sense of 'feeling more on top of things' after
my walk...it reminds me how good it is for me, at the end
of the day at work I usually feel a lot less tired if I
have gone to the exercise class funnily enough, by saying
'well done, that was great' to myself...I give myself
recognition for the accomplishment of doing it, we
usually say 'thanks' to each other afterwards...kind of
appreciation for doing it together.

Nearly one half of respondents tended to monitor their
physical appearance frequently. For example,

after a shower, I usually look in the mirror to see that
I'm not expanding!, I tend to jump on the scales nearly
every morning... to check that I'm the same hopefully, I
know when I have stopped doing exercise because my
clothes feel tighter.

Nearly one third of respondents tended to use the behaviour of
significant others as their base-line for exercise
participation. For example, "by going with the others helps me
to keep track of how I am getting on, I tend to do a bit more
than the others in the office, I don't want to be as unfit as
my husband." Others used an arbitrary standard, e.g., "I like
to have done some exercise each day so I use this as a bench
mark at the end of the day to see how I have done, I know that
we're supposed to do exercise about three times per week so I

kind of go by this at the end of the week." Finally, nearly
one quarter relied on reflective scheduling strategies, e.g.,

> I liked having an exercise sheet to complete at the
> beginning of each week, it helped me ensure that I had
> something to put down on it!, having my exercise
> scheduled into my diary also adds to the amount of things
> that I feel that I've accomplished each week.

In summary, no respondent claimed to have applied all
strategies though the majority had applied some of the
strategies. The majority of respondents tended to favour
various forms of planning strategies. Most of the respondents,
however, tended to report applying strategies unconsciously
rather than a conscious decision to use them. Interviews did
not reveal clear omission of strategies due to individual
attendance patterns in the course. This may be due largely to
the participant network system in the workplace and filling
colleagues in who had missed a particular session, supported
by class handouts and a recap at the beginning of each
session.

Exercise behaviour

Respondents varied by type, frequency, intensity,
duration and regularity of exercise behaviour following the
workplace Lifestyle Skills Motivation program. Nearly one
third of respondents combined brisk walking with either
volleyball, jogging, gardening or using a weights room
facility as their main form of leisure-time physical activity.
For example, one person commented, "at the end of the Fall we

moved onto three quarters of an acre of land so I've been busy all day at the weekends doing vigorous gardening." Furthermore, one quarter of respondents participated exclusively in brisk walking as their primary source of leisure-time physical activity. Brisk walking occurred before, during and after work as well as at the weekends. The majority of brisk walkers used this occasion to be active with significant others outside of work-time. Lunch-hour walking was typically a spontaneous decision to either walk alone or with a colleague. One quarter of respondents had been using the SRC over the last three months with varying degrees of regularity and one other had taken up using the fitness room in his residential complex. Interesting comments surrounding participation at the SRC included:

> it's very convenient, I like the music and the energy there, It can be a little intimidating over there. I'd prefer an older age group but then it is the SRC!, I'd rather be more active in the day than sit here at the desk but for my schedule the SRC offers a quick-fix workout, I feel great afterwards, Well, at least I don't have to worry about the weather.

Nearly one third reported that they were generally participating in moderate to vigorous activity at least three times per week, and nearly one quarter reported that they were generally participating in moderate exercise on a daily basis. The remainder were equally divided between generally participating in moderate physical activity at least five

times per week, twice per week and those who had not engaged in any form of leisure-time physical activity. Non-participants in leisure-time physical activity each expressed intentions to start in the spring when they hoped personal matters were more settled.

Respondents pursued physical activity with varying levels of intensity. Over one third commented that they participated in a vigorous fashion, particularly those attending the SRC, nearly one half described different levels of brisk walking and the remainder reported walking at a pace that they could just sustain a conversation. Respondents also varied in duration of exercise from twenty to forty minutes continuously, though walkers were less consistent than those attending fitness classes. When respondents were asked how stable their exercise patterns were, fewer than one quarter claimed that their routine did not change. Most of these people were committed to fitness classes. Other respondents suggested that locations, routes, frequency and durations tended to be flexible to suit their needs and circumstances. One quarter claimed that their exercise pattern was mostly stable, an equal number claimed that it was about 50% stable and the remainder claimed that it was generally unpredictable from one week unto the next.

In summary, over three quarters of the respondents believed that they and others in the workplace were participating in more exercise since the workplace Lifestyle Skills Motivation program. Nearly one third of respondents,

however, attributed behavioural outcomes to the opening of the nearby Student Recreation Centre (SRC) and only indirectly to the workplace health promotion program.

Alternative outcomes

The intervention program was a multifaceted process primarily intended to empower participants to think critically and self-direct an exercise behaviour change. A variety of alternative outcomes, however, were expressed by respondents in the form of knowledge, attitudes, skills and behaviours.

Knowledge and attitudes

Nearly one quarter commented that the course had challenged them as much to think about their health and well-being in an holistic manner. An equal number had gained knowledge and attitudes in other ways e.g., "it has been a long time...it felt good to learn something interesting again, I can put a few more names to faces, now at work, I'd like to do more of these courses." Over one third of the respondents commented that they felt better, fitter and less stressed since taking the program. Nearly one quarter of the respondents, however, pointed out that the strategies themselves required a lot of time and thought, which made them problematic.

Behaviours

Nearly all respondents commented that they had gained some useful stress management techniques from the program.

Over one third of respondents commented on using <u>breathing strategies</u>. For example,

> I have probably done the simple breathing exercises more than anything else...I try to do 3-5 deep breaths after I have saved something on the computer and while it does its thing, after I have had a difficult person at the front-desk I try to breathe away my frustrations, I try to be more aware of the tightness about my breathing now.

Nearly one third of respondents used various <u>modes of exercise</u> to relax. These were described in the following ways,

> I make a point of having a little walk around the office to fetch stationary or go to the photocopier after I've been on the computer for some time. This gives me a chance to stretch and unwind a little, I keep a squeezy ball by the telephone and use it during conversation...like now! I don't know what it does but it feels good!, I have made it a personal policy to walk to and from meetings on campus and I find that I'm a lot calmer for it, before and after, I tend to do too much. I really need to relax more. I wish I was more disciplined to walk every lunch time because when I do, I feel a lot better, when I do get into my regular walks and remember the breathing exercises It does help. I tend to have phases at it though, especially when things are really getting on top of me, rather than doing it consistently, my evening walks to the store give me some time for

myself for a change otherwise I am on the go all of the time.

One person commented on using <u>imagery</u> as a method to relax, "I never realised how natural visualisation was to me so I do it more often now to relax. I try to think only nice thoughts and have a few precious moments in the bathtub without worrying about a thing."

Nearly one quarter felt that the course had contributed to the organisation and practice of spending more quality time with family members. Furthermore, these participants tended to share course processes and handout materials with their partners or family members as topics for meaningful discussion. One person commented that she had been making a concerted effort to improve her sitting, standing and lying <u>posture</u> throughout the day. Finally, nearly one third of respondents commented on the value of the program as a <u>break from the usual work routine</u> e.g., "glad to get away from my desk, it was something to look forward to on Mondays and Thursdays, it made a nice change."

<u>Worksite management perspective</u>

Three senior personnel from management were interviewed regarding their perception of program outcomes. They were particularly impressed with the manner in which the program had been implemented over several months from conception to follow-up. Comments included:

I thought that the whole program was done very professionally, one of my biggest concerns initially was

the disruption this was likely to create, especially to
enable all of my staff the opportunity to participate.
However, the way that the staff involvement was handled
during the pre-planning and offering flexible course
scheduling caused minimal disruptions to staffing, you
easily fit into the office dynamics, the program actually
fit in nicely with our management goals of facilitating
collaboration and presenting a caring image to employees,
much involved in the course is rather like what we
encourage in staff training e.g., planning, evaluation,
communication skills etc.

Based on general perceptions, informal feedback from
employees and personal experiences from attending the course,
the managers were unanimous in their belief that the workplace
health promotion program had been "worth it." One manager,
however, felt that it could have been just as effective with
fewer sessions. When asked about specific outcomes that they
were aware of, comments were as follows:

increased networking among staff, increased morale, I
know some of my staff have started walking more,
healthier staff Christmas party!, visibility and
attention toward the wellness board aptly located in the
rest area, there's a few who have pursued memberships to
various fitness clubs.

One manager was quick to point out, "its difficult to say
whether it was the program or if it was the opening of the
Student Recreation Centre (SRC) that has caused the recent

interest in exercise participation,... maybe a bit of both?"
Two managers commented that those people in their section that
perhaps needed the program the most did not attend. They
suggested that these people tended to have chronic illness,
poor lifestyle practices and high absenteeism. Management had
not received any formal complaints by those who did not attend
the program but two of the managers suspected that despite no
additional work being burdened on non-attenders, some were
likely to be resentful of the time given to those from the
section who did attended the program.

As a direct result of the management's perceived success
of the workplace Lifestyle Skills Motivation program, a joint
proposal was developed between the instructor and the Director
of the Department of Housing and Conferences for university
funding to implement further courses for employee resident
advisors. Second, from workplace recommendations, the course
instructor was invited to present a seminar at the 'TOPS'
Weight Control annual conference at UBC in May, 1996. Despite
program intentions, management and employees typically adapted
and shaped program processes to suit their personal needs and
circumstances. A variety of unintended behavioural and non-
behavioural outcomes were thus reported from the educational
experience.

Summary

Application is clearly a complex, dynamic and
multifaceted process. Data reflected respondents' various

attempts at thinking critically and self-directing exercise behaviour change. Over half of the respondents proudly revealed some accomplishment gained in their efforts to participate in regular exercise, nearly half, however, expressed guilt and some were even apologetic that they were not doing more exercise. Respondents typically applied knowledge, attitudes and motivation strategies to a variety of physical activities with varying degrees of intention, frequency, intensity, duration and regularity. Application strategies could be categorised by <u>rigorous, creative and critically reflective thoughts</u> pertaining to the broad <u>social context, planning, action and evaluation</u> processes. At times, singular strategies were relied on, at other times a cocktail of individual, social and contextual strategies was employed to enhance exercise participation.

Alternative outcomes from the educational experience included perceived benefits from a break in the usual work routine, participants sharing course information with significant others, holistic health practices and an active workplace Christmas party. Learning was thus adapted and applied in a variety of ways to suit specific needs and circumstances. The descriptive statistics, quantitative and qualitative analyses will be discussed in the following chapter.

CHAPTER 5

DISCUSSION

Introduction

A meaningful discussion of the findings of this study needs to take into account the quantitative and qualitative analyses with respect to the research questions as well as consideration for the literature pertaining to the development and evaluation of worksite health promotion programs for exercise behaviour change.

Discussion: Question (1) Experimental Findings

(a) 7-Day Recall of Exercise Behaviour   A significant group by time interaction indicates that the response patterns of exercise behaviour for each group across the time factors are different ($p<0.05$). The Scheffe post-hoc comparison test reveals that the response patterns differ specifically between pre-program and post-program and also between pre- program and follow-up time periods in the direction predicted by hypothesis number 1. Figure 6 shows that the experimental group increased in exercise behaviour between pre and post-program whereas the waiting-list control group decreased in exercise behaviour for the same time period. Both groups, however, decreased in exercise behaviour at a similar rate from post-program to the three-month follow-up period. This is congruent with other findings reported in the literature that generally show various degrees of decrease in desired behaviours once

formal interventions are terminated. The experimental group, however, did not return to below baseline levels that occurred with the waiting-list control group.

Seasonal effects throughout the duration of this study help explain the continual reduction in exercise behaviour for the waiting-list control group. Testing began at the end of September 1995 which was one of the driest and sunniest months of the year. Post-program testing took place at the end of October, as winter began with dark evenings and colder and wetter days. Follow-up testing occurred at the end of January in a cold spell prior to Vancouver's first heavy snow fall of 15 cms. Despite seasonal effects, however, people in the intervention program participated in a higher frequency of exercise at post-program and at three-month follow-up than they did at the pre-program time-period. Furthermore, nearly twice as many people in the intervention group (50%) reported that they participated in exercise three or more times per week at the end of the three month follow-up than those people in the waiting-list control group (27%).

Exercise behaviour reported by the experimental group at post-program and at follow-up suggested that for the duration of this study the intervention program was more effective in <u>increasing</u> and <u>maintaining</u> a higher frequency of exercise behaviour. The hypothesis, therefore, stating that the experimental group will participate in a higher

frequency of exercise behaviour across the three time-periods than a waiting-list control group, is confirmed.

In combination with educational and environmental strategies, these results add further support to the belief that health education programs that are developed using Bandura's (1986) principles of self-efficacy are effective in increasing a variety of health behaviours, in this case, exercise behaviour. Furthermore, these findings lend support to the conclusions made by Bouchard et al. (1990) who suggested that intervention programs focused on self-regulation of exercise behaviour can be effective for exercise adherence. Lamb and Brodie (1990), however, pointed out several points of caution when interpreting findings from self-report exercise behaviour questionnaires. First, these methods are very likely to suffer from <u>social desirability bias</u> to satisfy the experimenter and, therefore, overestimate actual levels of exercise participation, particularly at post-intervention time periods. This may well have influenced lower follow-up reports for the waiting-list control group who completed these questionnaires prior to their intervention. Second, the <u>accuracy</u> of a recall questionnaire can suffer if respondents have a poor memory or lack of motivation. Third, a <u>learning effect</u> can occur when using these questionnaires on multiple occasions. Finally, due to weekly fluctuations in exercise behaviour, self-report questionnaires can lack the <u>sensitivity</u> to measure improvements accurately. This is

further illustrated from the interview data and also by the high standard deviations in exercise frequency recorded by both groups throughout the three time periods. The researcher did attempt to administer the questionnaire to both groups with similar instructions. It would, therefore, be expected that with the exception of social desirability bias the remaining issues would occur for both groups simultaneously.

(b) Exercise Self-Efficacy A significant group-by-time interaction indicates that the response patterns of exercise self-efficacy for each group across the time factors are different ($p < 0.01$). The Scheffe post-hoc comparison test reveals that the response patterns differ specifically between pre-program and post-program, post-program and follow-up, and also between pre-program and follow-up time periods in the directions predicted by hypothesis number 2. Figure 6 shows that the experimental group increased significantly in exercise self-efficacy between pre and post-program. This was as hypothesised since a main aim of the intervention program was to develop self-efficacy. Course processes were thus designed to incorporate Bandura's (1986) principles of self-efficacy and a variety of self-regulatory strategies to overcome barriers that could prevent regular exercise.

The most striking difference between self-efficacy and exercise behaviour data is shown when comparing the post-program and the three month follow-up period. Unlike

exercise behaviour, the experimental group exhibited a slight increase in exercise self-efficacy between the post-program and the follow-up period which suggests that a broad array of strategies focusing on critical self-directed learning for exercise behaviour change may have a positive and lasting effect on exercise self-efficacy. In contrast, the waiting-list control group showed a significant decline in the same time period consistent with that also shown in exercise behaviour. Low exercise behaviour combined with previously cited seasonal effects help to explain the continual decline in self-efficacy for the waiting-list control group.

All participants in the experimental group, in comparison to 63% in the waiting-list control group, reported at the three month follow-up that they were more than "moderately" confident that they could overcome specific barriers cited on the exercise self-efficacy questionnaire and could participate in regular exercise. Levels of exercise self-efficacy reported by the experimental group at post-program and at follow-up suggested that for the duration of this study, the intervention program was more effective in <u>increasing</u> and <u>maintaining</u> higher levels of exercise self-efficacy. The hypothesis stating that the experimental group will have higher levels of exercise self-efficacy across the three time periods than a waiting-list control group, is, therefore, confirmed.

These findings lend support to Marcus et al.'s (in press) conclusions from a workplace study with female employees who found that subjects in a stage-matched intervention showed positive change in self-efficacy in comparison to subjects in a standard self-management program. Furthermore, these findings are congruent with other studies in the literature that reported increases in specific self-efficacy behaviours following health education programs that were developed using Bandura's (1986) principles of self-efficacy (Allegrante et al., 1993; Jemmot & Jemmot, 1992; Lorig & Gonzalez, 1992; Rose, 1992). It would appear, therefore, that Bandura's (1986) four sources of developing self-efficacy, in conjunction with broader educational and environmental strategies are also capable of increasing self-efficacy in worksite health education programs that are intended to enhance regular exercise.

Self-reported measurements of exercise self-efficacy, however, need to be treated with the same caution as previously stated in relation to exercise behaviour questionnaires. Self-efficacy is based on the interaction between an individual's estimation of the demands and conditions of a particular task, adequate coping strategies they believe they possess, and especially their ability to apply these strategies in a specific exercise situation (Bouffard et al., 1991). It relies on a perceptual, rather than a rational, estimation of a person's capability. For example, a person may perceive his or her ability to cope

better than or worse than it actually is. Similarly, a person may perceive that he or she has a lack of time available to do regular exercise when in fact there may be more time available but the person may manage time inefficiently, or it may be a convenient excuse. The lack of available sources to verify the reality of these perceptions, therefore, presents a potential problem when measuring this construct.

A criticism that could be aimed at exercise self-efficacy scales that have been developed in the literature (Garcia & King, 1991; Marcus et al., 1992; Sallis et al., 1988) and of the instrument used in this study is the inclusion of "when on vacation" as one of the barriers to exercise. For those people who go on vacation once per year and for two weeks in duration, it would seem that this item would contribute very little as a barrier to regular exercise. As one item out of a total of five on the questionnaire, it may have added some error to the overall exercise self-efficacy scores reported in this study. Second, the exercise self-efficacy scale used in this study omitted the following barriers: "a lack of social support from significant others", "commuting", "child care opportunities", and "exercising after a long relapse". The data from Table 13a (stages of exercise behaviour change) and also from interview data suggested that these barriers were in fact important factors that influenced participation in exercise for the subjects in this study.

(c) Stages of Exercise Behaviour Change Data in Table 13a
are congruent with other studies reported in the literature
(Booth et al., 1993; Marcus et al., 1992; Marcus et al.,
1994) indicating that subjects were in various stages of
exercise behaviour change at pre, post-program and follow-
up. At pre-program, the distribution of subjects from each
group in the stages of exercise behaviour change was the
same. Furthermore, subjects had not been participating in
regular exercise within the previous six months. Data
gathered from the stages of exercise behaviour change
questionnaire (see Appendix B) revealed that approximately
three quarters of participants, at some stage prior to this
study, had previously participated in regular exercise. This
illustrates one of the problems with the literature on
exercise adherence; that it often implies that dropping out
of a specific exercise situation results in a sedentary
lifestyle. An individual may cease to participate in one
exercise situation but go on to continue in another exercise
pursuit depending upon personal preferences, seasons and so
forth. These findings support the view held by Lovato and
Green (1990), that bias may be caused by the self-selection
of relapse-prone subjects into experimental studies and also
by the tendency for subjects to inflate post-program
behavioural improvements to satisfy the experimenter. The
bias in turn contributes to an increase in the likelihood of
significant decreases in behaviour between post-program and
follow-up time periods.

Table 14 indicates a significant change in the pattern of the stages of exercise behaviour change between the two groups at post-program and at follow-up. By the end of the program 42% of the experimental group, in comparison to 13% of the waiting-list control group, reported that they were participating in regular exercise. Table 13b shows that between pre-program to the three month follow-up time period, 20% of the experimental group progressed from contemplating exercise to participating in some exercise, although not regularly (i.e., preparation stage). Bandura (1986) noted that behavioural intentions to attain certain levels of performance or engage in a specific course of action increase the likelihood that the goals will be realised. Interestingly, for the same time period, 27% of the waiting-list control group regressed from some degree of participation in exercise to contemplating this behaviour. This suggests that program processes focusing on behaviour change models, drawn from a variety of fields, were effective in helping people move and sustain an increased involvement in exercise participation. In addition, being part of a positive group experience, in itself, may have helped to move some subjects closer toward contemplating action. Data cited in Table 13a and in Table 12, in conjunction with the results from exercise self-efficacy, further corroborate the findings from Marcus et al. (1992) who found a significant relationship between self-efficacy and the stages of exercise behaviour change.

Marcus et al. (1996) suggested that tailoring treatments to particular stages of change would accelerate peoples' progress toward exercise maintenance. To some extent, this mirrors contemporary approaches to adult learning theory which recognise that adults are at different stages of development and progress at different rates. Adult education, however, occurs in a social context and has a broader agenda than individual counselling. For example, contemporary approaches to adult education view behaviour change as an individual and social contextual process. In particular, critical self-directed learning challenges mixed-ability learners in an inclusive learning environment toward the art, science and politics of behaviour change. This approach is not only enriched by diversity but is also more realistic and appropriate than staged-matched programs occurring in multicultural worksite settings.

Conclusion: Question (1) Experimental Findings

In response to the first research question, data indicate that within the seasonal phase and duration of this study, worksite health promotion programs derived from behaviour change models drawn from a variety of fields can be effective in increasing and maintaining higher levels of exercise behaviour, exercise self-efficacy and the stages of exercise behaviour change relative to a waiting-list control group. A small improvement experienced by many people with respect to self-efficacy, the stages of exercise behaviour

change, and exercise behaviour could have a major overall impact on well-being and subsequent health care costs. Comparative outcome data broadens the appeal of this study to potential policy makers, decision makers, and market forces that have interest in this sort of information (Scriven, 1993).

These results, however, need to be interpreted with caution and the intervention program should not be viewed as a panacea for worksite health promotion programs to increase and maintain exercise behaviour. First, the study employed a field experiment in which neither subjects nor the intervention were randomly assigned to groups. Although both worksite locations had access to a nearby fitness facility for staff participation throughout the study, it should be noted that the Student Recreation Centre (SRC) opened in the same week as the intervention program began. The novelty and increased awareness of the opening of this facility close to the site of the intervention group could have had an additional influence on exercise behaviour for these participants than that of the established fitness facility in close proximity to the site of the waiting-list control group. Second, data relied on self-report measures of exercise behaviour, exercise self-efficacy and stages of exercise behaviour change which can be influenced by a number of factors as already stated. Third, data collected over a relatively short and specific period of time as well as the limited number of time periods during which data were

collected do not permit further analysis of whether the exercise behaviour levels had stabilised by the time of the three month follow-up. To attribute change specifically to the intervention, more rigorous measurements of natural change trends, directions, and rates prior to the start of the program would inspire a greater confidence. Although a waiting-list control group was used for the purpose of this study, financial and subject recruitment constraints restricted the use of multiple base-line measures. Fourth, it should be noted that the intervention was being compared with a 'waiting-list' control group rather than a control group receiving equal attention. At the end of post-program and follow-up time periods, the mean exercise frequency level for the intervention program (2.54 times per week) was still less than the guidelines recommended by the American College of Sports Medicine (1990). In addition, only approximately one fifth of participants in the experimental group at this time period reported in the stages of change questionnaire that they were generally participating in regular exercise.

Although quantitative analyses show statistical significance, evaluating isolated behavioural variables as a result of a program neglects valuable information regarding the process of change. In order to understand more fully the probable explanations for the significant quantitative results, program evaluation, journal and interview data were analysed to reveal the degree to which these variables were

part of a larger system of individual, social and other contextual factors that shaped application. The following discussion examines possible relationships between the intervention, quantitative findings and broader factors that influenced post-educational application.

Discussion: Question (2) Factors Affecting Application

Green and Kreuter's (1991) Proceed evaluation framework was used as the guiding framework to assess post-educational experiences of a random sample of 50% of participants (n=13) from the experimental group. This is a useful framework for the study of post-educational change experiences because of its emphasis on process and its broad perspective on context. The Proceed framework makes the thought processes and circumstances explicit. It, therefore, offered a realistic and flexible framework to describe how program intentions became transformed to the realisation of behavioural outcomes. The following sections reflect the varied experiences of those who attended the intervention program and their various attempts at applying critical self-directed learning for exercise behaviour change.

(a) Social Contextual Factors Interestingly, most participants referred to factors in the social context as being key to participation in exercise. None of the participants in this study enjoyed the total luxury of a barrier-free context of application, teeming with social support and with convenient and abundant access to exercise

facilities (Ottoson, in press). A myriad of complex and dynamic social, workplace, commuting and environmental factors were reported to shape whether and how learning was applied. For some respondents, these factors rendered exercise participation as a low priority or largely beyond their personal control. They viewed the locus of control to be external with family members or significant others in the workplace context. On the other hand, a number of participants were in situations where they were able to resolve these issues through negotiation skills, most often with other family members, and apply various degrees of critical self-directed learning for exercise behaviour change. These findings corroborated with Carron, Hawsenblas and Mack (1996), who conducted a meta-analysis of the impact of social influence on exercise involvement. They found that social influence of others does make a difference in exercise interventions.

The social network that had been established from the class offered additional opportunities to participate in regular exercise and to evaluate attempts at applying learning. The opening of the Student Recreation Centre became an integral part of the intervention. Not only did 15-20% of participants make use of this fitness facility but clearly others were motivated to do exercise by its publicity and by those colleagues who did use it. Bandura (1986) postulated that self-efficacy is developed through appropriate vicarious experience. The opening of the Student

Recreation Centre may well have contributed indirectly to the increase in self-efficacy reported by the experimental group.

Competing interests, responsibilities and priorities played a key role in exercise participation. For example, car-pooling arrangements or the distance travelled to the workplace by many of the participants typically limited options for daily physical activity. The impact of social contextual barriers meant that for many participants, opportunities to participate in exercise were limited to weekends or the relatively brief period at lunch times. Despite the benefits of fresh air, fitness, weight control and relaxation, very often the thought and will-power required for lunch-hour exercise had to compete with more immediate thoughts and feelings regarding the relative ease and attractiveness of being able to go to the nearby rest area, escape work, sit down in peace and quiet or enjoy uninterrupted and relaxed socialisation without having to battle against the weather, self-motivation or the inconvenience of locating appropriate changing and showering facilities. Alternative arrangements for exercise were often possible and at times sought by some; however, lunch time exercise was seen as being unnecessarily harder for some than others. Although change occurred at the individual level, change was also required by significant others in the context of post-educational application to provide the support and stimulation that enhanced exercise behaviour

change. A broad cross-section of significant people included: the local community, extended family members, partners, spouses, off-spring, management, workplace supervisors, and colleagues.

(b) Health Promotion Factors, Health promotion factors refer to combined educational and environmental approaches. These factors, and in particular, the educational component are of particular interest to program implementers since not only are they key to influencing application but they can also address diverse participant needs and circumstances, and they have the greatest capacity for producing change in individual and social contextual factors. The timing of the educational program was an important aspect of the intervention given the opening of the Student Recreation Centre and participant concerns regarding activity levels, especially with long nights and winter approaching. It should be noted, however, that sensitive negotiations with management prior to the course were critical to gain their support and ensure that the program was made accessible to all employees, on-site and in work time. It was evident from a variety of sources during the Precede planning phase that for various reasons participants would not have attended the program if it had been offered outside work time. To assist this process and primarily for research purposes, the program and services of the implementer were provided free of charge. Still, management had to calculate the cost-benefit balance to justify the potential disruption and

release time required to enable all employees to attend the program.

The worksite health education program focused on critical thinking and problem-solving to enhance exercise self-efficacy. Vicarious learning is a key component of self-efficacy (Bandura, 1986b). This was operationalised in the learning process by the teacher and by the learners themselves. For example, course content included positive self-talk and imagery techniques to enhance a learner's ability to apply vicarious learning methods. The teacher also provided one example of a role model by sharing personal experiences of learning and health behaviour change that were likely to be appropriate, meaningful and relevant to the learners. Additionally, the teacher had the opportunity to model health education by demonstrating an enthusiasm for learning, teaching and the practice of health behaviours. Teachers who show warmth and empathy to the learner are more likely to foster vicarious learning. Finally, the teacher encouraged a voluntary social network among the learners. This provided a source of reinforcement as well as a peer-modelling opportunity to enhance participation in healthful behaviours. Learners were also an excellent source of role models. They shared their experiences and suggestions for participating in health behaviours through the social experience of learning about health behaviour. Thus multiple role models in the worksite health education program provided a variety of opportunities

to increase the probability that a learner would benefit from vicarious experience and enhance exercise self-efficacy.

The educational experience was generally evaluated very highly by respondents. The perceived value of the course was reflected in the relatively high attendance throughout. Research indicates that participant satisfaction plays a major role in continued employee participation and that this increases when employees are actively involved in planning the programs and where programs show warmth and personal concern in their interactions (Green & Kreuter, 1991). The data reflected multiple reasons for the continued high attendance and perceived success of the program. Curiosity and no financial obligation were incentive for some to attend the program initially. One participant commented, "I probably would not have come [to the program] if I'd have had to pay. But, having been to the course, [I can now say] it would have been worth it."

It appeared that the program was valued as much for its social value and being an enjoyable break from the usual work routine as it was for personal development. A number of participants also reported that they gained a lot of inspiration from the discussion with other colleagues who faced many similar barriers. Bandura (1986, p.191) asserted that interaction is the primary basis for social learning. This principle was applied in this program by encouraging participants to be actively involved in the needs assessment

and program development. Further, learning opportunities were provided to engage participants individually and socially for critical self-directed learning. Despite organisational problems inherent with multiple learning venues, this process further assisted interaction as a result of instructor encouragement for participants to take responsibility to remind each other of the weekly locations through a networking support system.

The qualitative data show aspects of the intervention that are not clearly visible in the quantitative findings; namely, the role and conduct of the instructor. It was evident from a variety of feedback sources (formative and summative program evaluations, interview data and Table 15), that the instructor was a significant aspect of the intervention. Many of the participants commented on the relationship between the instructor and the outcomes of the program. It should be noted that the instructor had considerable experience in adult education and currently teaches in the Teacher Education program at the University of British Columbia. Providing considerable information regarding progress is likely to increase self-efficacy as well as act as an important source of social support (Bandura, 1990). This was achieved by focusing on the application of motivation strategies for exercise behaviour change, problem-solving, co-operative learning strategies, various questioning techniques, and discussion opportunities, as well as creating a worksite community of

critical thinkers and self-directed learners for health behaviour change. These findings add further support to the view that attention must be paid to integrate personnel evaluation into program evaluation research (Scriven, 1993). Furthermore, these findings suggest that a learner-centred approach focusing on critical self-directed learning is an effective instructional strategy in a worksite health education setting.

Despite high praise and the perceived success of this instructional approach in a workplace setting, it should be considered one example of an effective learner-centred approach rather than the panacea of instruction in worksite settings. There are multiple conceptions of effective instruction each with different implications for curriculum and instruction (Pratt 1992). In criticism of this approach, however, it could be argued that an instructor's performance should be secondary to learning outcomes in terms of the usefulness of course processes for exercise behaviour change. Second, a few responses suggested that course processes did not adequately challenge some learners, particularly those who perceived themselves to be more advanced in their stage of exercise participation.

Interestingly, during individual consultations in the Precede planning phase prior to the worksite Lifestyle Skills Motivation program, participants were generally less confident about their abilities and participation levels. To ensure that a more responsive needs assessment is carried

out in future it is recommended that greater probing skills are employed during this interaction which might include how individuals compare themselves with others who are likely to attend the program. More attention should also be paid to responses provided on the stages of exercise behaviour change questionnaire prior to the program. Second, teacher-directed heterogeneous learner groupings are more likely to create sufficient social disequilibrium to foster focused attempts at collaboration and enhance co-operative learning. According to Mezirow (1994), the process of learning is shaped and delimited by our frames of reference. Learning, thus, occurs from a disorientation which leads one to reflect critically on the assumptions and beliefs that have guided his or her life. Therefore, to understand the meaning of our experience we are driven toward viewpoints which are more functional, inclusive, discriminating and integrative of our experience. This would minimise selective homogeneous and cohesive ability groupings that can otherwise be established and marginalized. Third, providing a balanced range of case scenarios and even asking participants to prepare and bring to class similar problems to solve would facilitate more meaningful and mixed ability learning to occur in specific and detailed circumstances. Kemerer (1991) pointed out that the key to application resides in the learner's perception of how important, meaningful and relevant the new learning is to his or her ability to work effectively in the setting where the application must take

place. Thus, the multiple meanings and realities of the learners illustrates that when teaching, one must find a balance between providing challenging content that retains the long term goals of the program while also meeting the needs of the learner.

The range of motivational strategies covered within the Lifestyle Skills Motivation program tended to re-affirm the importance of negotiation, planning and preparation for some, while others found that they offered a new way of organising their day or week and, therefore, increased the likelihood of participating in regular exercise. In contrast, nearly one quarter of participants commented that they felt the strategies were somewhat "technological" or even "unrealistic" and "idealistic" given the context in which they had to operate. These participants felt that many of the demands that they faced together with their perceived limited power were beyond negotiation or planning for change. Many participants expressed a need to spend more time on the contents of the program. This may have reflected why data in Table 15 indicated that handout materials were also perceived to be particularly useful for respondents in their efforts to apply learning. These materials may have provided a further opportunity to continue course processes beyond the scheduled timings. It appeared that for many of the respondents, what they had learned most from the educational experience was an understanding of a broad motivational framework for exercise behaviour change, to

experience how various strategies might be applied and to select those which best suited their situation.

(c) Individual Factors, Participants were variously predisposed, enabled and reinforced by multiple factors to apply critical self-directed learning for exercise behaviour change. Individuals were predisposed with varying degrees of knowledge, attitudes, beliefs and values for exercise behaviour change. It is important to note that behaviour change may and does occur without prior knowledge and attitude change. Motives to attend the Lifestyle Skills Motivation program reflected those found in the worksite health promotion literature (weight control, active living and motivational skills). These findings concur with the Canada Fitness Survey (1983) data that reasons for being active are strongly health related. For example, in the Canada Fitness Survey, 60% reported that to "feel better" was a "very important" reason for being active. Other reported motives for being active included "fun", "excitement", "fitness", "social interaction", "weight control", "improved flexibility", and "stress management". Gauvin (1990) concluded that individuals who exercise regularly have two streamlined reasons for participating in regular exercise and physical activity, namely: fitness and looking good. Ashford and Biddle (1990) found that participants over 25 years of age were much more likely to report motives associated with health and relaxation than were younger subjects. Thus, it would appear that physical

fitness and well being are central motives for participation
in regular exercise. Although Dishman (1988) suggested that
health factors may be important motives in the initiation
stage, exercise <u>adherence</u> is more likely to be related to
immediate sensations of enjoyment and well-being, that is,
reinforcing factors more than predisposing factors. Some
participants in this study acknowledged that their motives
changed as the course progressed and the social aspect
became a strong incentive to attend the worksite health
education program.

Despite contact with every individual prior to the
program, it was evident from some responses that at the
individual level the needs assessment was not sufficiently
detailed to reveal the diversity of perceived abilities,
experiences and stages of exercise behaviour change. This
led to the erroneous perception by the course instructor of
the stages of some; hence, participants were generally
viewed as being in a contemplation or early preparation
stage of exercise behaviour and with little confidence to
sustain regular physical activity. It appeared, however,
that those people in a "late" preparation stage of exercise
participation tended to want more emphasis during course
processes placed on specific motivational strategies for
maintaining exercise participation rather than the balance
given toward strategies for initiating as well as
maintaining exercise behaviour.

The majority of respondents reported that various course processes increased their sense of control over perceived motivation; for others, it helped only marginally. Lovato and Green (1990) concluded that,

> Adopting a healthful practice may show little immediate reinforcement other than the satisfaction of self-control. This may be sufficient for some to override the hassles because the values and beliefs from which the satisfaction is derived make the accomplishment of self-control intrinsically satisfying(p.77).

Those who did not feel greatly empowered by the strategies tended to view the locus of control with other members of their family, "significant others" or with other environmental factors. These people also tended to feel more negative about their own health status and ability to control it.

Participants were <u>enabled</u> through various skills, barriers and opportunities to apply learning for exercise behaviour change. The majority commented that they had learned a lot of useful tips from the course. Social and other contextual factors, combined with varying degrees of previous experience and the number of respondents who commented that more time was required to understand fully the motivational strategies, help to explain the varying degrees of perceived ability to apply learning. For some participants, an exercise game-plan comprised of planning, action and reflection strategies was a positive framework

that enabled them to feel more confident that regular exercise would take place. In particular, negotiation strategies with significant others to share workloads, intentions and co-ordinate timetable commitments were considered very useful for initiating exercise and certain imagery strategies also appeared to increase enjoyment of the exercise experience. Many participants commented that the "workplace walking routes sheet" developed for before, during and after-work walking opportunities was a useful process both for the workplace setting and for stimulating ideas to self-direct a variety of walking routes around the home environment. This sheet was constructed as part of course processes by participants and tended to act as a trigger for discussion and a source of motivation for some to try new walking routes. For others, however, circumstances in the local environment prevented such plans from being formulated or put into action. Participants were thus presented with an array of opportunities and barriers to application. In addition to specific characteristics reported in social contextual factors, participants also differed in perceived health status, energy levels, self-motivation and available time to think adequately about and prepare for application.

Participants reported receiving various sources of reinforcement for post-educational application. The literature suggests that both intrinsic and extrinsic motivation are important determinants of exercise behaviour.

It is important to note, however, that the exercise activity itself must be intrinsically rewarding as there is some evidence to suggest that reliance on external motivators may reduce intrinsic reward in the long term (Weinberg, 1984). For some participants, the intrinsic feelings of control, the sense of satisfaction, perceived fitness, and the perceived increase in coping ability as a result of application were reported as internal sources of reinforcement. During this study, reinforcement was endorsed by the instructor in terms of providing encouragement and facilitating networking experiences as well as through helping subjects to self-monitor their thoughts, feelings and actions and encouraging them to recognise their own successes and to praise themselves through positive self-talk. The generalizability of motivational strategies to other health practices and family life were mentioned by many participants as additional reinforcement for their value and application. This supported the view by Green, Wilson and Lovato (1986) who suggested that when individuals take a greater initiative to develop their system of rewards, behaviour tends to generalise and the reinforcement values are internalised within each individual's own value structure.

Respondents reported that external reinforcement came from: social forces (colleagues, family and friends), diary pages, pulse-rate monitoring, or visibly through body image. For example, program processes to develop a worksite

community of critical thinkers and self-directed learners for health behaviour change played a major role in reinforcing learning since some participants met regularly outside the class to participate in a variety of physical activities. Interestingly, a lack of social support was reported by many participants from diverse circumstances as a main barrier that hindered post-educational application. This supported the findings of Dishman (1982) who found that spouse and family support were very important predictors of exercise participation. There are, however, points of caution regarding the heavy reliance on social support as a means of external reinforcement. Well intended intimidation, for example, may cause social friction and is unlikely to increase the value a person places on the behaviour or to increase the maintenance of the desired behaviour in the long term.

A host of individual factors, therefore, taken separately or in combination, affect application. For example, individuals may possess the appropriate skills and a strong sense that they can execute them well but still fail to perform because they feel no personal commitment to the behaviour. Furthermore, a change in behaviour typically involves a temporary surrender of security and the production of some anxiety, and requires difficult decisions and awakenings about particular lifestyle practices that some people may find very difficult to confront and find easier to resist. It would appear, therefore, that those

individuals who are more likely predisposed, enabled and reinforced to apply critical self-directed learning are also more likely to succeed with exercise behaviour change.

Conclusion: Question (2) Factors Affecting Application

Exercise behaviour change is clearly a long and dynamic process that is shaped by multiple factors. Single variable research is thus inadequate to capture the complexities of post-educational application. Journal and interview data, guided by the proceed evaluation framework revealed the interrelationship of complex and diverse social contextual, educational and policy, and individual factors that shaped application following the worksite health promotion program. Ottoson (in press) noted that, "adult education deserves neither all the credit nor all the blame for the level and quality of application following adult education programs since it is but one element of a larger context." Although change occurred at the individual level, it appeared that the power to influence resources, money, and significant others had a significant effect on whether and how learning was applied.

Data indicated that subjects varied in their context of application, personal resources and perceived power, social support, perceived exercise self-efficacy, previous experience, motives, understanding, and stage of application. As Steuart (1993) pointed out, an understanding of the determinants of change has an implicit concern for

the obstacles to change which lie at the heart of the challenge to health education.

Discussion: Question (3) Process of Application

According to Fullan (1991a), educational change induces the transformation of subjective realities by learning new ways of thinking and doing, new skills, knowledge, attitude and beliefs. He warned, however, that when change is interpreted in an oversimplified way and neglects these aspects it can lead to an erroneous perception of change (false clarity). For the purpose of this study, critical self-directed learning was defined as rigorous, creative and critically reflective thoughts (critical thinking) pertaining to individual and collective exercise behaviour change. Critical thinking and self-directed learning, therefore are considered separate though related and critical components in the problem-solving process. Data reflected that critical self-directed learning had been applied in a variety of ways following the worksite health promotion program. For example, respondents reported thinking critically when engaged in conscientious and careful planning and evaluation (i.e., what, which when, how, assessment of strengths and weaknesses); assessing alternative ways to overcome obstacles as well as making connections with solutions for other health behaviours; and using a variety of planning, action and evaluation strategies. Furthermore, critical thinking was applied, not

only toward the application of problem-solving strategies, but also by respondents increasing their self-awareness of health practices and the influence of significant others and the local environment on personal health behaviours. This suggests that intervention processes helped to raise the level of consciousness for exercise behaviour change beyond simply that of the individual but also toward the influence of social and other contextual factors. It should be noted, however, that with the exception of one participant who lobbied for changing and showering access, others did not report political lobbying activities at the social, worksite or community level to enhance the potential for collective empowerment with respect to health behaviour change. This may reflect the political apathy, individualism or conservative nature of many North Americans in employment or, on the other hand, the perceived employment insecurity that can lead from engaging in these types of activity.

Many participants suggested that an understanding of the broad motivational framework in terms of "planning", "doing" and "reflection" helped them to manage exercise motivation. Some translated this framework into particular motivation strategies (e.g., networking, time-management, imagery) that were more relevant to their situation. Others commented that a better understanding of the components of physical fitness added to the enjoyment and relevance of fitness class activities as they were more able to make connections between certain exercises that they performed

and the "S" factor components: suppleness, strength and stamina. Thus, relative to pre-intervention, for many, having a broad motivation framework to draw upon and a better understanding of the components of fitness increased their sense of control over motivational issues and, therefore, enhanced exercise self-efficacy. When respondents were asked specifically to articulate how their <u>confidence</u> had been increased to participate in more exercise, a number of participants attributed this to the combination of program processes (e.g., a positive atmosphere), the application of specific strategies (e.g., networking, scheduling, imagery) and perceived relative increases in activity levels.

<u>Self-directed learning</u> was applied in the problem-solving process by employing various social contextual, planning, action and evaluation strategies for exercise behaviour change. <u>Social contextual strategies</u> were typically applied through networking processes to enlist the support of significant others and/or negotiation skills to ensure that both individual and social needs could be accommodated. Few respondents felt completely autonomous with decisions to participate in exercise. Equally, a minority of participants opted for solitary participation in exercise as a means to take advantage of time out and personal space.

Scheduling and developing walking route opportunities appeared to be the most widely applied <u>planning strategies</u>.

Scheduling activities typically involved setting health priorities, having daily and/or weekly exercise agendas that were constructed either late at night, early in the morning and/or on weekends. In some cases, these plans succeeded in being a fixed feature in a person's routine. For others, responsibilities and demands were such that constant juggling was required on a daily basis to ensure that exercise priorities could be best achieved. Relatively few participants relied on unplanned and spontaneous exercise participation on a regular basis. Those who did reported mixed success with this approach. Typically, planning strategies required critical thinking to ensure that the exercise experience was often multi-purposeful and enjoyable rather than a dutiful and effort-focused experience. These findings corroborated with Strecher et al. (1996), who suggested that, goal setting enhances self-efficacy, satisfaction and positive attributions for causes of successes and failures and empower individuals to address new challenges.

An assortment of "action" strategies were employed during exercise participation as a means to increase motivation and enhance the exercise experience. For those who preferred brisk walking activities, strategies most often involved various forms of cognitive and behavioural dissociation skills such as talking to others, self-talk, problem-solving and/or focusing on pleasurable thoughts or surroundings in the local environment. These findings

supported the research by Martin et al. (1984) and Johnson
and Siegal (1992) who found that dissociation strategies
could reduce perceived effort during health related aerobic
exercise and, therefore, enhance the exercise experience.
For those people engaged in fitness class activities, a
combination of association and dissociation strategies were
employed to enhance the exercise experience. Particular
association strategies in this setting included focusing on
movement technique, the beat of the music and energy
expenditure.

Four major evaluation strategies were typically
applied: subjective evaluation of the exercise experience,
physical appearance, comparisons made with behavioural
patterns of significant others, and personal diary
reflections. A subjective evaluation of the exercise
experience was typically carried out either by arbitrarily
scoring the exercise process from 1-10, self-evaluation of
one's own performance, acknowledgement of multiple benefits
of exercise during or after participation, and personal
and/or social praise for accomplishing exercise
participation. Physical appearance was often assessed
through reflections in mirrors, on bathroom scales and one's
perceived fit into clothing. Comparisons made with
behavioural patterns of significant others took the form of
being aware of others attending fitness classes or going for
lunch-time walks and perceiving fitness levels of
significant others. Personal diary reflections included the

monitoring of daily or weekly exercise targets and reviewing diaries to re-affirm weekly accomplishments. Furthermore, weekly journal entries that were required for research purposes, in themselves served as a continuing form of intervention. Evaluation strategies provide feedback on progress as well as the strengths and weaknesses of the planning or exercise experience. This can result in a powerful means of enhancing self-efficacy. These findings concur with Juneau et al. (1987) who noted that, meaningful and convenient self-monitoring is a powerful means of positive reinforcement that enhances re-scheduling and thus exercise adherence. Interestingly, none of the participants reported using heart rate monitoring or the Borg Rating of Perceived Exertion as a regular method of monitoring fitness levels. This adds further evidence to support the belief that a pre-occupation with training in the heart rate zone may be inappropriate for health-related exercise adherence (Marcus et al., 1994). It may well be that such physiological approaches are viewed generally as less meaningful to participants than methods that are more tangible and low-tech, requiring little specialised knowledge.

Exercise behaviour as applied by participants varied according to type, frequency, intensity, duration and regularity. The majority of participants preferred brisk-walking activities. Brisk walking is an ideal form of self-directed exercise since it can be a useful form of transport

and does not require any specialist equipment, clothing, venue, cost or supervision, all of which can act as barriers to habitual exercise. The exercise preferences of these subjects substantiated the research by Stephens, Jacobs and White (1985), who found that people prefer (particularly among those who are initially unfit) moderate intensity activities (e.g., brisk walking) as opposed to more vigorous activities and those they can perform individually rather than in a structured setting. Studies have shown that unsupervised exercise at relatively low levels (i.e., low to moderate intensity 60-77% maximum heart rate) such as brisk walking, when performed on a regular basis, was sufficient to increase significantly the functional capacity in apparently healthy sedentary adults and was also associated with reduced cardiovascular morbidity and mortality (Bouchard et al., 1990; Hardman, 1989; Pate, Pratt & Blair, 1995; Rippe et al., 1988; Shoenfeld et al., 1988). The preferred times (or realistic times) for exercise participation appeared to vary between the participants from early morning, to just before bed-time. Others reported that rather than plan a specific exercise session they found it easier to increase existing daily activity by "doubling" the distance of regular walks during daily tasks. In contrast, approximately one quarter participated in a fitness class activity preferring the music, energetic atmosphere, and quick-fix high energy work-out, without having to be concerned about climatic and seasonal weather patterns. In

terms of supporting quantitative data that was gathered from the Exercise Behaviour Questionnaire, over three quarters of respondents believed that they and others in the workplace were participating in more exercise since the workplace Lifestyle Skills Motivation program. An illustration of the limitations of the seven day recall questionnaire, however, was that only one quarter reported that on a weekly basis their exercise pattern was mostly stable whereas one half of respondents claimed that it was generally unpredictable from one week unto the next.

Conclusion: Question (3) Process of Application

The intervention program was a set of multifaceted processes rather than one component; thus, data provided valuable feedback regarding the perceived contributions made by particular aspects within the program. Learning was adapted and applied variously by type, frequency, intensity, duration and regularity to suit individual needs and circumstances. Perceived self-efficacy affects one's intentions for change, how hard one tries after one decides to change, one's resilience following setbacks, and how well one maintains the gains that he or she achieved (Bandura, 1986). During post-educational application, participants interacted directly with their local environment and, therefore, learning was not applied uniformly. Adaptation refers to the degree to which learning that had been applied in practice had deviated from the original idea. None of the

participants reported using all of the motivational strategies promoted in the course outline. Most participants used selective aspects of the program that best suited their abilities, needs and circumstances, some participants were still "grappling" with the motivation strategies and others planned to use the strategies at a later date when they anticipated that their personal situations would be more settled. Furthermore, change did not simply occur at the individual level but was also required by those who interacted in the context of application. These findings concur with the literature on implementation (Marjone & Wildavsky 1979), suggesting that post-educational application necessitates mutual adaptation between the concept and the context so that behaviours can be adapted to local situations and changing circumstances.

Discussion: Question (4) Alternative Outcomes

Relative to intended learning outcomes, a variety of alternative outcomes gathered from a semi-structured interview, in the form of knowledge, attitudes, skills and behaviours were expressed by respondents following the worksite Lifestyle Skills Motivation program. For example, respondents on the whole commented that they felt better, fitter, less stressed, more able to cope and were having more quality time with significant others. A number of participants commented that the motivation strategies had been reinforced by their success in generalising to a

variety of holistic health behaviours (e.g., stress management, posture practices). Scheduling stress reduction activities, in particular, breathing techniques, was especially popular. Interestingly, self-efficacy is assessed in relation to very specific behavioural referents since each situation is different (Bandura, 1977); therefore, although self-efficacy may be situationally specific, the self-regulatory strategies that contribute to self-efficacy may to some extent be generalizable to other behaviours of interest. This may provide an interesting hypothesis for future studies. On the other hand, several respondents commented that the motivational strategies required a lot of time and effort which tended to add to the perceived total amount of effort required for an exercise experience and thus made them at times problematic. Fullan (1991a) noted that the amount of energy and time required to learn new skills is a useful index for the size of the resistance to it.

In the responses from many of the respondents it was implied that attending the program afforded the benefit of being able to indulge in an enjoyable and worthwhile break from the usual work routine as well as for personal development. Several respondents commented that the value of the educational experience had rejuvenated an interest to pursue further learning activities. This is congruent with a contemporary belief that educational processes should help empower learners with the motivation and skills for lifelong

learning experiences. Signs of apathy, however, became apparent with the activities of the workplace wellness representatives. Despite participants' desire, volunteer nominations and considerable assistance from the course instructor with informational materials, ideas, prompting and even stage-managing the issue of access to showering facilities to support and mobilise worksite wellness representatives into action, this role was beginning to be perceived by the two individuals at the three month follow-up as an additional burden to existing workloads. In future, a committee of wellness representatives would be more likely to share the responsibility and be more supportive in their efforts to establish and maintain this process collectively.

Management reported that they had not noticed any marked increase or decrease in absenteeism over the duration of this study. Health education programs are not the panacea of worksite health promotion since they operate as one element in a larger context of change that is required in workplace settings (Green & Kreuter, 1991). Management were aware of an increase in staff morale and participation in a variety of exercise activities including the departmental Christmas ice-skating party as well as an increase in attention that had been given to information on the "Wellness Board" located in the rest area. Management were not directly consulted with respect to the creation of a worksite wellness board and worksite wellness representatives which, in hindsight, could both have been a

potential problem. Judging from the rapport between instructor, management and employees, as well as the spirit captured within the program to enhance active living in the worksite, this oversight did not, however, develop into a potential problem.

Despite no additional work-burden for those employees who did not attend the worksite health education program, the issues of non-participation and potential resentment were concerns raised by management. These employees were believed to be in the most need for lifestyle change. This concurs with Dishman (1991), who found that those who do not participate in worksite exercise programs typically have high CHD risk profiles. A number of issues, however, relate to those employees in the precontemplation stage. First, their position toward exercise involvement should be respected. Vertinsky (1992), for example, warned against falling into the trap of health fascism and narcissism in contemporary health promotion programs. Second, the worksite Lifestyle Skills Motivation program was specifically intended for those employees who were at least in the contemplation stage of exercise participation. In other words, those people who had rationalised some intention and desire to participate in more exercise. Workplace health promotion strategies targeting those employees in the precontemplation stage of health behaviours require a different approach than that used in this study. Research suggests that strategic poster and newsletter campaigns that

are not victim blaming and aimed at both the advantages of
participation as well as the disadvantages of non-
participation in health behaviours are more effective for
those in precontemplation than generic programming
approaches (Marcus et al., 1992; Marcus et al., 1994;
Prochaska et al., 1992). This approach should also be
reinforced by the frequency of implementing perceived
successful health promotion programs focusing on those who
are not in the precontemplation stage. The instructor in
this study was thus sensitive to these issues and therefore
made a point of being courteous and talkative to all
employees during frequent on-site visits throughout the
implementation process.

Green and Kreuter's (1991) Precede-Proceed model
enabled a collaborative venture throughout the
implementation process in order to gain the acceptance of
all parties and address their needs in the worksite
Lifestyle Skills Motivation program. According to
Witherspoon (1990), many workplace health promotion programs
are not successful because they function in the absence of a
supportive corporate culture. As a direct result of the
management's perceived success of the worksite Lifestyle
Skills Motivation program, a joint proposal was developed
and accepted for University funding to conduct further
programs within the Department of Housing and Conferences in
1996-97.

Conclusion: Question (4) Alternative Outcomes

Health promotion in the workplace is primarily concerned with supporting healthful lifestyle practices that go beyond simple behavioural approaches. According to Steuart (1993), "health education should be concerned with all conceivable ways of inducing health related behaviour change associated with which the actual health status of individual, family and community is improved. The influence-attempts of health education are brought to bear on behaviours that, in themselves, lie within culturally defined 'normal' limits" (p.53). A variety of unintended behavioural and non-behavioural outcomes were reported from the educational experience including: perceived benefits from a break in the usual work routine, participants sharing course information with significant others, holistic health practices and workplace benefits. These findings tend to concur with Sime (1984) who found that exercise participation was associated with a good and relaxed feeling, and an improved quality of life as well as a sense of accomplishment and well-being which may be derived from self-initiative and can increase self-esteem, confidence or self-concept. Management and employees typically adapted and shaped program processes to suit their personal needs and circumstances.

CHAPTER 6

<u>SUMMARY, CONCLUSIONS, IMPLICATIONS, RECOMMENDATIONS</u>

<u>Review</u>, Despite greater public awareness of the physiological and psychological benefits of regular exercise, as little as 8-20% of the population are sufficiently active to attain these health benefits (Centres for Disease Control, 1990). Compounding this problem, the typical drop-out rate from exercise programs has remained at approximately 50% (Dishman, 1991). The World Health Organisation has identified one of its targets for the year 2000 to be the provision of health education programs which should enhance the knowledge, motivation and skills of people to acquire and maintain health (WHO, 15). This is an encouraging statement since, clearly, a major challenge facing health promotion is to increase participation and adherence to regular exercise.

This study began with a comprehensive review of literature pertaining to concepts, intervention strategies and behaviour change models drawn from a variety of fields to enhance exercise behaviour. Interventions focusing on self-regulatory cognitive and behavioural skills have contributed significantly to increasing and maintaining physical activity levels in an exercise setting (Dishman, 1994). Self-regulation emphasises personal responsibility for developing and maintaining health promoting behaviours on a permanent basis. Bandura's (1986) self-efficacy

construct is based on the principle of self-regulation.
Self-efficacy has shown success in many health behavioural
change programs such as condom-use (Jemmott & Jemmott,
1992), drug refusal (Jones et al., 1990), AIDS preventative
behaviour (Kasen, 1992 and Magura et al., 1991), adult
health (Leviton, 1989), heart disease prevention (Rose,
1992), adolescent health (Sprunger & Pellaux, 1989), smoking
cessation (DiClemente et al., 1985), weight control (Bernier
& Avard, 1986), and exercise program participation (McAuley
& Jacobson, 1991). According to Lawrance and McLeroy (1986),
self-efficacy is the principal connection between knowledge
and action since it is based on knowing what to do, and how
and when to do it. Evidence supporting the generalizability
of Bandura's principles for developing self-efficacy in a
worksite health education program to increase participation
and adherence to leisure-time physical activity, is as yet
unclear.

Exercise behaviour is complex and is not simply an all
or nothing phenomena. Marcus, Selby, Niaura, and Rossi
(1992) suggested that there are different stages of exercise
involvement. Thus, the amount of progress a person makes as
a result of an intervention may also depend upon the stage
of exercise involvement they were in at the start of the
program. Intervention programs, therefore, should be
sensitive to the different stages and needs of those
individuals whose behaviour is expected to change. A growing
body of evidence is accumulating to suggest that self-

efficacy is directly related to the stages of behaviour change (Marcus et al., 1992, Marcus et al., 1994, Prochaska et al., 1992).

Researchers have cautioned, however, against the exclusive reliance on psychological approaches and self-development in adult education (Grow, 1994, Hammond & Collins, 1991, Law & Rubenson, 1988). Contemporary approaches to adult learning take into account the interconnectedness of learner autonomy and personal development with a critical reflection of the broad social context which in part shapes the application of a behavioural change. Critically reflective, as well as, self-directed learning strategies are thus central to contemporary approaches to adult education programs.

An essential part of program development focuses on program implementation. Green and Kreuter's (1991) Precede-Proceed model is an educational and environmental approach to health promotion. This model takes process into account and has a broad perspective on context thus providing a flexible and realistic framework for planning and evaluating worksite health promotion programs. Program implementation is not only concerned with planning and evaluation, but also the way in which programs are delivered. A learner-centred approach to instruction that focuses on a nurturing and challenging learning environment enhances critical thinking and self-directed learning. This approach assumes that adults bring a variety of needs and experiences to worksite

health education programs and, therefore, should be encouraged collectively, as well as individually, to be resources for their own and each others' learning (Knox, 1986).

For the purpose of this study, a worksite health promotion program was developed by integrating behaviour change models from the literature on exercise science, health promotion and adult education. The aim of the program was to empower participants individually and collectively with the knowledge, attitudes and specific skills to think critically and to self-direct exercise behaviour change. Essentially, learning activities focused on collaboration, interaction, critical reflection and application. Exercise behaviour change was thus viewed as an individual and social contextual process.

Purpose of study. The purpose of this study was to gain a better understanding of the effects of, and the application of learning following a worksite health promotion program that was developed by integrating behaviour change models from a variety of fields.

Methodology. Multiparadigmatic and multidisciplinary research is required to gain a better understanding of the complexities of post-educational application (Ottoson, 1995). This study was situated in a post-empiricist perspective, however, a broad set of pluralistic research questions, intervention and data collection strategies were employed consistent with multiple epistemologies. The

principle of participation was employed throughout the twelve-month implementation of this research project (Green, 1986). Such research is not as tidy as it might appear. Decisions, disappointments, and near-disasters are part of any intervention research, especially when it is situated in a field setting as evident in this study.

A field experiment focused on assessing the following key outcome variables for the duration of the study: exercise behaviour, exercise self-efficacy and the stages of exercise behaviour change. Appropriate statistical analyses were conducted to make comparisons and infer causal effects pertaining to post-educational application. Second, to interpret these findings and gain further insight to the factors affecting application as well as the process of application, a random sample of 50% of the participants from the experimental group was tracked and interviewed over a three-month period. Appropriate qualitative analyses were conducted to identify and categorise key themes within the Proceed framework pertaining to post-educational application. Therefore, an eclectic set of quantitative and qualitative tools was employed to study the complexities of the contextually-bound, dynamic, on-going and multifaceted process of post-educational application.

Results, The findings of this study indicated that structural changes occurred in the workplace environment to facilitate healthful behaviours. Quantitative outcome data indicated that changes occurred in exercise self-efficacy,

exercise stages of change and exercise behaviour ($p<0.05$).
Qualitative analysis revealed that a myriad of <u>individual</u>
(e.g., experiences, motives and intentions for exercise
behaviour change, barriers, skills) <u>social</u> (e.g.,
colleagues, spouses, family and other forms of social
support) and other <u>contextual</u> (e.g., home, workplace and
community) factors shaped post-educational application of
exercise behaviour change. Furthermore, learning was adapted
and applied in a variety of intended and unintended ways to
suit specific needs and circumstances. As part of the
intervention, results and implications of this study were
recycled back to participants in the workplace setting to
further help mobilise the workplace community for exercise
behaviour change.

Conclusions

Conclusions drawn from this study need to be
interpreted cautiously, for example, in light of the field
methodology, reliance on self-report data and the duration
of the investigation period. Data from this study tends to
concur with Green and Cargo's (1995) suggestions that
worksite health promotion programs that integrate behaviour
change models drawn from a variety of fields and are
tailored to the needs and circumstances of those attending
the program can be effective in increasing health
behaviours. This study investigated exercise adherence.
Second, multiple factors influenced whether and how learning

was applied therefore <u>individual</u> (e.g., critical thinking, goal setting, time management, imagery), <u>social</u> (e.g., networking, negotiation, advocacy) and other <u>contextual</u> (critical reflection, community empowerment) strategies were required to enhance post-educational application of exercise behaviour change. Learning was thus variously adapted and applied in intended and unintended ways to suit specific needs and circumstances. Changes to healthful behaviours were more likely to occur from incremental, rather than radical changes required by individuals and significant others who interacted in context. Essentially, post-educational application was an individual and social contextual process. That is, individual motivation connected to and interacting with contextual factors. For example, critical reflection and lobbying for change in the social context can enhance exercise behaviour change. Furthermore, high individual motivation may be sufficient to overcome moderate contextual barriers, and high contextual barriers could dampen if not extinguish moderate motivation. The findings of this study have implications for <u>workplace policy and program development</u>, <u>workplace health education instruction</u>, <u>post-educational application</u> and <u>future research</u> in the area of post-educational application of exercise behaviour change. These findings, however, need to be interpreted with caution in light of the field research methodology, reliance on self-report data, involvement of the researcher/instructor throughout the implementation

process and the duration and seasonal time period of the study.

Implications for workplace policy and program development

Workplace policy

Management, local supervisor and administrative support, as well as, responsive programming are critical to employee participation in workplace health promotion programs (Anspaugh, Hunter & Savage, 1996; Emmons, Linnan & Abrams, 1996; Glasgow, McCaul & Fisher, 1993; Green & Cargo, 1994). In this study, substantial management support was achieved through a series of meetings and negotiations with management personnel, prior to the program, and continual communications and updating during the implementation process. Management demonstrated their support by allowing the program to take place on-site and in work-time. Appropriate venues were provided together with flexible shifts for all employees within workplace sections to attend the program. Furthermore, program participants included key management personnel.

Program development

Worksite health promotion programs facilitate health behaviour change if they are developed in accordance with best principles and practices offered by the literature pertaining to behaviour change and program implementation. Exercise behaviour change requires consideration for physiological, psychological and socio-environmental

intervention strategies (Dishman, 1994). This was operationalised in this study by integrating macro and micro behaviour change models and using theoretical concepts and intervention strategies from adult education and exercise psychology respectively (See Table 16). Furthermore, this study supported the concept of <u>active living</u>, a contemporary approach to the promotion of physical activity.

Active living is a way of life in which physical activity is valued and integrated into daily living routines and leisure pursuits (Denny, 1996). In workplace health promotion, for example, this can include minimising the use of transportation (e.g., by using a bicycle or walking before, during and/or after work), parking vehicles at a distance from the workplace station, using a stairwell instead of an elevator and engaging in "active breaks" in the workplace environment. Active living can also include various types and forms of leisure and recreation activities to suit individual preferences and situations. The concept of active living thus places less emphasis on exercise intensity, individual testing and physiological benefits of exercise than on habitual daily physical activity as a positive experience for holistic health benefits. Active living is thus promoted as an individual, social and inclusive process. Graham (1996) proposed five key ingredients for promoting active living in a [workplace] community: people, policies, programs, partners and

promotion. These factors are embedded within the diagnostic framework of the Precede planning model used in this study.

Embracing the literature pertaining to worksite health promotion, program planning, adult teaching, and program evaluation enhances program implementation. Green and Kreuter's (1991) Precede-Proceed model is an educational and environmental approach to health promotion planning and evaluation. Over 500 applications of this model have been reported in the literature and it provides a flexible and realistic framework for worksite health promotion programs. Central to Precede-Proceed is the principle of participation. Green and Kreuter (1991) noted that people are more committed to initiating and upholding those changes that they helped design or adapt to their own purposes and circumstances. Throughout the implementation of this study, worksite personnel were actively involved in the planning, learning and evaluation phases of the program. Volunteers within the program shared responsibility with the course instructor for photocopying learning materials and passing on communications with respect to venue changes. Following the program, elected participants volunteered to co-ordinate a workplace wellness network and bulletin board to promote social events, display health issues and act as an advocacy role for workplace health promotion.

Essentially, the essence of program development for health behaviour change should not be viewed as an exportable box but rather as a process of planning for and

integrating macro and micro behaviour change strategies that are tailored to the needs and circumstances of those attending programs. Program development is thus considered as an individual and social contextual process.

Implications for instructors of worksite health education programs

The findings of this study suggested that a learner-centred approach focusing on critical self-directed learning for exercise behaviour change, where both teacher and learners are appropriately engaged, enhances post-educational application of a worksite health promotion program.

Creating a worksite community of critical thinkers and self-directed learners for healthful behaviours requires instructors of health education programs to apply a range of strategies. Figure 7 illustrates a broad instructional framework for facilitating critical self-directed learning for health behaviour change. Essentially, worksite health education programs occur in a classroom context, thus various classroom contextual, as well as curriculum and instructional strategies can be employed by instructors to facilitate critical self-directed learning for health behaviour change. The following guidelines are intended to assist instructors with this process:

CLASSROOM CONTEXT

CURRICULUM / INSTRUCTION

PREDISPOSED

**CRIT.
SDL.**

ENABLED ——————— **REINFORCED**
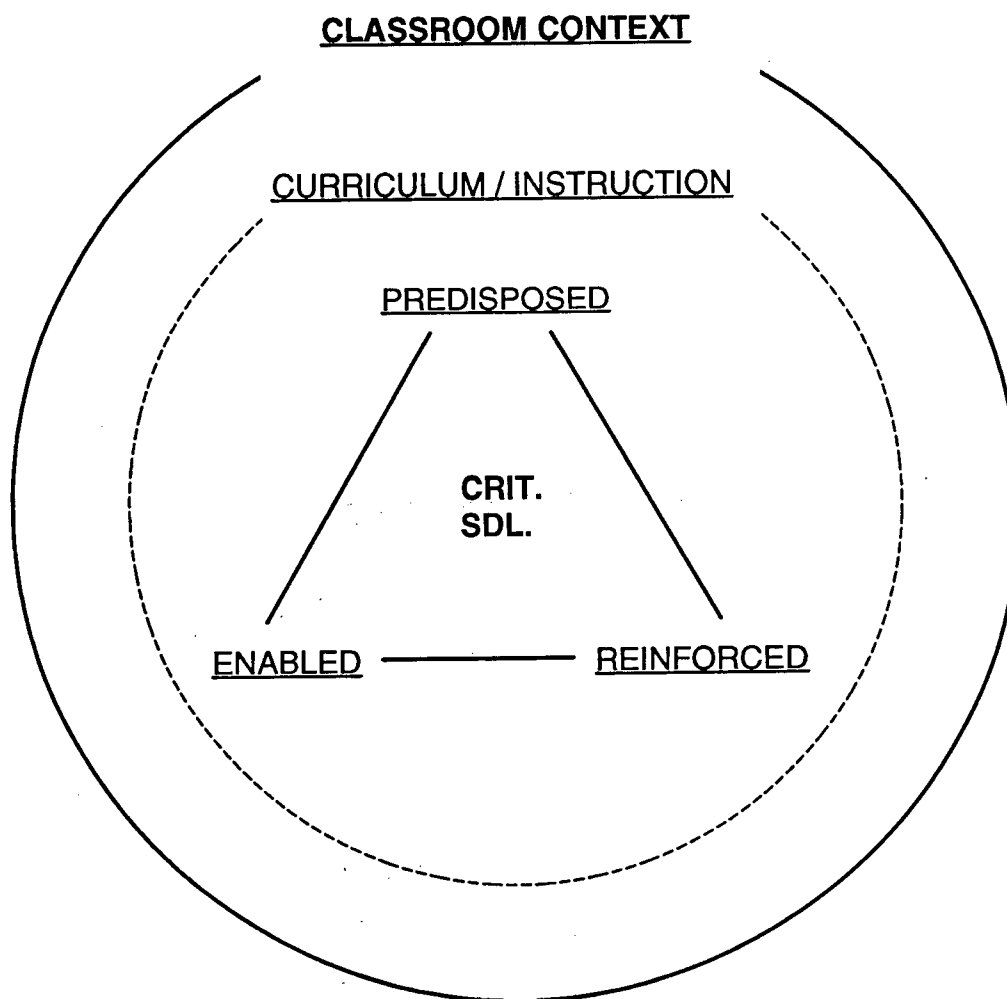
Figure 7. **Instructional Framework for Facilitating
Critical Self-Directed Learning for
Health Behaviour Change**

Classroom contextual strategies

(1) Prior to the course, conduct a comprehensive "needs

assessment". This provides rich information regarding

authentic health issues that occur in the context of

the workplace setting and local community. It also reveals participants' interests and motives for learning. Moreover, it provides a valuable insight into the diversity of learners knowledge, attitudes, skills, behaviour and health status. An insufficient needs assessment, as happened in this study, resulted in erroneous assumptions about the homogeneity of learners with respect to the stages of exercise behaviour change. This lead some learners to feel that the course was not completely targeted to their situation. A comprehensive needs assessment, therefore, should be integral to planning course processes to ensure that programs are tailored to the needs and circumstances of those attending the program (Green & Kreuter, 1991).

(2) Creating an optimal learning environment is central to facilitating a classroom community of critical thinkers and self-directed learners (Brookfield, 1995; Noddings, 1988). In this study, the <u>physical learning environment</u> (i.e., walls, furniture) was arranged to facilitate group work and on-going examples of learners' work, as well as, appropriate materials were displayed on walls. The agenda for each session was posted on a board together with provocative topic-specific questions (see Appendix F) related to the previous session, current session and personal experience. An informal <u>social environment</u> allowed multiple opportunities for both instructor and learners to share experiences, interact

and be actively involved in the learning process. Each

session required learners to work in groups to problem-

solve and to generate questions about application of

learning. To enhance the social learning climate, a

selection of fruit was organised and shared among

program participants during the learning process.

(3)   Encourage a critical reflection of the broad social

context and potential solutions for enhancing health

behaviour change in the local community and workplace

setting (Garrison, 1992; Wallerstein & Bernstein,

1988). For example, as happened in this study,

opportunities were provided to discuss the following:

individual and social contextual factors that influence

exercise behaviour, media practices pertaining to

exercise participation (e.g., stereotyping, hegemony,

consumerism, techno-dependency, individualism), access

issues to local facilities, and workplace practices and

opportunities for active living. Furthermore,

encouragement and support were given to help mobilise a

workplace wellness committee/network and associated

activities.

<u>Curriculum and instructional strategies</u>

(1)   Apply principles of learning and employ a variety of

teaching styles and teaching methods throughout the

teaching/learning process (Knox, 1986). Participants in

this study perceived active involvement to be very

beneficial to application. In particular, problem-

solving in social groupings allowed individuals to share experiences and adapt strategies for exercise behaviour change. According to Johnson and Johnson (1988), heterogeneous mixed ability groupings are most effective for facilitating critical thinking in problem-solving situations.

(2) Instructors can help predispose, enable and reinforce participants in their efforts to think critically and to self-direct health behaviour change. In this study, for example, participants were _predisposed_ by allocating appropriate class time to discuss: what it means to think critically and to engage in self-directed learning, a conceptual framework for exercise motivation, concepts and principles of health and fitness, and developing self-efficacy. Data indicated that for many learners the broad motivational framework with which to negotiate the complex world of application was what they had gained most from the course. Participants were _enabled_ through multiple opportunities to apply motivational strategies in authentic problem-solving situations that were developed from experiences within the group. Interactive methods such as informal worksite/community surveys, case studies, personal program development/analysis, discussion, video analysis, role play, barriers identification and strategy development were particular useful to examine application issues.

Ottoson (1995) asserted that, "application needs to be a process not an assumption; it needs to be made more salient, not subsumed; it needs to be at the forefront of adult education programs, not an afterthought" (p.27). In addition to those strategies cited above participants were further <u>reinforced</u> to think critically and to apply self-directed learning strategies toward the development of a workplace wellness network. Furthermore, frequent opportunities enabled individuals and small groups to engage in self-evaluations and instructor/course evaluations. Essentially, teaching and learning in worksite health education programs should be an individual and social contextual process.

(3) Finally, develop a critically reflective practice throughout the teaching/learning process in order to balance content and the long-term goals of the program while also meeting the needs of learners (Brookfield, 1995). Throughout this study, to retain program support, sensitivity was directed to the social context in which the program operated. For example, careful consideration was given to continual liaison with management in order to meet their expectations for program implementation. Equally, minor program adaptations were required to empathise with the everyday occupational demands facing program participants. Evaluation feedback provided a stimulus

to acknowledge with participants aspects of the course
that were most useful and those aspects, where
possible, that could be improved.

Implications for post-educational application of exercise behaviour change

Post-educational application occurs in contextually
bound and relatively unpredictable patterns of human
interaction (Ottoson, in press). Data indicated that
predisposing, enabling and reinforcing factors influence
this process, therefore, a variety of individual and social
contextual strategies are required to enhance exercise
behaviour change. Figure 8 illustrates a broad conceptual
framework for enhancing post-educational application. Table
16 provides examples, within this framework, of strategies
drawn from the data and a variety of literature, that
enhance exercise behaviour change. These strategies may in
fact be adaptable to a variety of health behaviours.

Critical thinking strategies refer to macro and micro
thoughts pertaining to factors that influence exercise
behaviour change. Macro thoughts relate to broad social and
other contextual factors that affect change in exercise
behaviour (e.g., critical examination of the social,
political, economic, historic, geographic and cultural
context of application), while micro thoughts relate to
individual strategies that enhance immediate participation
and the exercise experience (e.g., juggling priorities,

SOCIAL CONTEXT

PLANNING

CRITICAL
THINKING

ACTION ——————— EVALUATION

Figure 8.   Critical Self-Directed Learning Framework for
Enhancing Post-Educational Application of
Exercise Behaviour Change

rigorous and creative planning, focusing); social contextual

strategies refer to physical and social environmental

factors that can influence exercise participation (e.g.,

mass communications, personal safety issues, local

facilities, financial control, networking, advocacy,

negotiation skills, social support). Data suggested that

social support, from family, friends and/or significant

others was a key determinant of exercise participation;

Table 16.　Critical Self-Directed Learning Strategies for Enhancing Post-Educational Application of Exercise Behaviour Change: An Individual and Social Contextual Process

SOCIAL CONTEXTUAL STRATEGIES	PLANNING STRATEGIES	ACTION STRATEGIES	EVALUATION STRATEGIES
MACRO * Networking * Community empowerment *MICRO* * Awareness of social milieu 　- population characteristics 　- power 　- mass comms. 　- political forces 　- historic influences 　- social justice 　- environmental concerns * Advocacy role * Negotiation skills 　- communications. 　- assertiveness 　- respect/tolerance 　- co-operation * Identify & utilise social support and environmental opportunities * Avoid social and environmental barriers	*MACRO* * Community needs assessment * Community educational and environmental approaches *MICRO* * Needs assessment 　- quality of life 　- health status 　- behavioural status 　- predisposing, enabling and reinforcing factors * Education 　- concepts and principles of health fitness 　- access and utilise resources * Preparations 　- decision-balance sheet 　- goal setting 　- time management 　- venue 　- plan "B" * Stimulus control 　- posters 　- photographs 　- inspirational quotes 　- exercise clothing	*MACRO* * Community participation *MICRO* * Imagery strategies * Focusing strategies * Positive thinking strategies * Tension control strategies * Holistic health behaviours	*MACRO* * Barriers identification & motivation strategy development * Monitor social contextual change *MICRO* * Barriers identification & motivation strategy development * Self-reflection and self-monitoring: 　- exercise experience, 　- exercise context, 　- social experience 　- environmental experience, 　- subjective performance, 　- enjoyment, 　- thoughts and feelings 　- phys. appearance, 　- heart rate, 　- perceived exertion, 　- diary/ calendar entries
C　R　I　T　I　C　A　L　　T　H　I　N　K　I　N　G			

planning strategies refer to resource gathering and organisational factors to enhance action (e.g., conducting a comprehensive needs assessment, health education, goal setting and time management). Data suggested that scheduling was one of the most useful strategies for exercise participation; action strategies refer to factors that enhance participation and the exercise experience (e.g., community events, engaging in holistic health behaviours, employing appropriate cognitive strategies). Activity-related imagery strategies, in particular, were variously described as enhancing the exercise experience; and evaluation strategies refer to reflective judgements that enhance exercise behaviour change (e.g., identifying individual and social contextual barriers, self-monitoring and self-reflection). Participants in this study suggested that informal judgements about the exercise experience often enhanced progress and motivation for subsequent exercise. Essentially, post-educational application should be considered an individual and social contextual process.

While the findings of this study have important implications for workplace health promotion, there are a number of limitations that must be identified.

Limitations of this Study

(1) Experimental approaches to identify comparisons and causal connections are undoubtedly resource intensive and difficult to implement.

(2) Subjects were not randomly assigned to experimental and waiting-list controls. Neither was treatment randomly assigned to the two sites. At management request, central office was chosen to serve as the experimental program site. The waiting-list control group, however, were aware of receiving the intervention at a later date. Thus, the non-random assignment of treatment to groups might have reflected an inherent bias in the predisposition of management and workers in that site, or a bias produced upon agreeing to participate whereby the motivation of management and workers in that site could have changed as a result of signing on as the experimental site (Hawthorne Effect).

(3) Due to the self-selection bias of subjects who volunteered for this worksite health promotion program in the Department of Housing and Conferences (UBC), these subjects may not be representative of a true sample of the workplace population in this setting.

(4) The worksite health promotion program was designed specifically for those participants who intended to participate in regular exercise. It was not intended for those people in the precontemplation stage. The results, therefore, should not be generalised to worksites in which random samples of the entire workforce would be enrolled in such a program.

(5) The intervention was being compared with a 'no-treatment' control group. A placebo control group would

have allowed the intervention program to be assessed over and above the results attributable to attention or the "Hawthorne effect," which is considered to be an intrinsic component of many interventions. It could be argued, however, that social programs are complex and multifaceted processes and thus it is misleading to make comparisons and implicitly treat variations in social programs as intentionally and functionally equivalent (Cronbach 1975, 1986).

(6) In an attempt to increase the rigour of the field research methodology, Glasgow et al.'s (1993) recommended criterion for participation in workplace health promotion programs was utilised. In hindsight, this criterion is somewhat arbitrary and assumes that only those people who stay for 50% of the program could be expected to benefit from the program or to have been influenced by it. For health education programs that involve multiple sessions and varied participants, some people get as much out of one session as others get out of four or five, or at least what they get out of one session is sufficient to produce the same result obtained by others who attend more sessions. Indeed, the most highly motivated people might be among those who drop-out early, reasoning that they do not need the program to achieve their exercise or fitness goals.

(7) The seven-day recall Exercise Frequency Questionnaire focused on leisure-time physical activity and omitted domestic physical activity.

(8) The relatively low test-retest reliability of the 7-Day Recall Exercise Frequency Questionnaire (0.74,P<.001), suggests that the re-test only explains approximately 50% of the variance in the pre-test.

(9) The subjective self-reported scoring of dependent variables on the Exercise Behaviour Questionnaire was not independently confirmed, hence this may cause bias.

(10) The relatively short follow-up did not take into account varying seasonal changes or other long-term factors that may affect application, but these applied equally to experimental and waiting-list comparison groups.

(11) The exact type, frequency, intensity, and duration of exercise required to attain the health benefits of exercise are not known; they will likely vary from person to person. The ACSM recommendations are only guidelines to attain the physiological benefits from exercise. From a psychological perspective, research suggests that one should exercise on a daily basis at low intensity to attain the psychological benefits of exercise (Biddle, 1995).

(12) As a barrier to worksite participation, laboratory measures of physiological fitness were not carried out in this study. Some subjects, however, expressed an

interest in having such procedures. Offering this service in the future as an extra-curricular option, therefore, would not only enhance the appeal of the intervention for some, but would provide further evidence regarding the efficacy of the findings from this study.

(13) The political world and social context influences the whole process surrounding post-educational application. It is important to note, therefore, that judgements made from program evaluation are not value-free. Due to financial constraints and the lack of qualified personnel to deliver this program, the instructor and the researcher were the same person which may have caused bias in terms of participant responses to research questions, as well as to the interpretation of findings from this study. The dual role of researcher/implementer is not only grounded in extensive program experience, but is also politically and socially ethical and moral in a system of pluralistic interests.

(14) The findings of this study are specific to the context of this worksite setting. Recommendations, therefore, regarding the generalizability of such findings should be held tentatively and subject to many caveats. Social programs are complex multivariate packages that detract from theoretical purity and homogeneity of local implementation (Cronbach, 1975). When adequate

attention is paid to local conditions, any
generalisation is a working hypothesis rather than a
conclusion. Based on the readers experience, therefore,
a rich description of findings from this study
facilitate the generalisation of these experiences to
similar contexts not studied.

Recommendations for future research focusing on post-educational application of exercise behaviour change

Recommendations for future research in the area of
post-educational application include the following:

(1)   Organise collaborative research teams to apply multi-
       disciplinary and multi-paradigm approaches to
       investigate post-educational application of exercise
       behaviour change.

(2)   Case study research and, where appropriate, measures of
       physiological status would attract greater support from
       scholars of exercise science for post-educational
       application of exercise behaviour change.

(3)   Multiple and heterogeneous studies of health education
       programs (workplace, community and schools) with larger
       sample sizes, multiple pre-test and post-test measures
       collected over a one year period to take into account
       seasonal variations would enhance the efficacy of
       research findings pertaining to post-educational
       application. Green and Kreuter (1991) noted,
       however, that there is often a high turnover of

worksite personnel and the prohibitive cost of a
follow-up for organisations is a barrier against long
term studies of this nature.

(4) Worksite/participant-driven research questions (Park,
1993; Green, George, Daniel, Frankish, Herbert, Bowie
and O'Neil, 1995).

(5) Finally, future research may wish to examine the extent
to which variations in worksite health promotion
programs affect application (e.g., worksite support,
worksite facilities, program composition/duration,
instructional approach and class size).

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APPENDIX A

A LIFESTYLE SKILLS MOTIVATION PROGRAM: CRITICAL SELF-DIRECTED LEARNING FOR EXERCISE BEHAVIOUR CHANGE

SESSION (1) INTRODUCTION
Lifestyle and physical activity
Motivation and physical activity
Introduction to motivational strategies
Profiling exercise behavior

SESSION (2) FITNESS MONITORING & ACTIVE LIVING
Total fitness and physical fitness
Principles of training
Body's response to exercise

SESSION (3) WEIGHT MANAGEMENT & ACTIVE LIVING
Energy balance
Healthy eating
Energy expenditure and active living

SESSION (4) TENSION CONTROL AND ACTIVE LIVING
Stress response
Stress management strategies
Tension control and exercise

SESSION (5) PLANNING STRATEGIES FOR ACTIVE LIVING
Social factors and support strategies
Goal setting
Time management

SESSION (6) MENTAL SKILLS AND ACTIVE LIVING
imagery
Imagery strategies
Focusing strategies
Positive thnking strategies

SESSION (7) EVALUATION STRATEGIES FOR ACTIVE LIVING
Social factors and support strategies
Self-monitoring

SESSION (8) APPLIED MOTIVATION STRATEGIES
Barriers and solutions to exercise participation
Action plan for exercise adherence
Discussion: exerccise motivation and implementation

Program Aims and Objectives

The aim of the worksite Lifestyle Skills Motivation program is to empower participants individually and collectively with the knowledge, attitudes and specific skills to think critically and to self-direct regular exercise. Using Green and Kreuter's Precede framework, the following learning outcomes are intended.

Knowledge

(1) to understand the benefits of regular exercise.
(2) to increase awareness of walking routes and local exercise options.
(3) to identify barriers and high risk situations that can prevent regular exercise.
(4) to understand a broad motivational framework that can enhance exercise adherence.
(5) to think critically about multiple factors that influence the participation in regular exercise.

Beliefs/Attitudes

(1) to enjoy the participation in regular exercise.
(2) to collaborate and work cooperatively in course problem solving activities.
(3) to foster positive attitudes toward the participation in regular exercise.
(4) to increase the belief that the application of motivation strategies will increase participation in regular exercise.
(5) to increase the belief that one is able to apply motivational strategies to overcome barriers and participate in regular exercise.

Skills

(1) to be able to think critically and problem-solve to enhance exercise adherence.
(2) to apply a variety of individual, social and other contextual motivational strategies that enhance exercise participation.

Experiences

(1) engage in a variety of individual, partner, small and large group activities pertaining to critical self-directed learning for exercise behaviour change.
(2) experience a nurturing and challenging learning atmosphere.

GUIDELINES: SESSION GUIDE (1) <u>INTRODUCTION</u>

(1) Exercise Behavior Questionnaire (ASSESSMENT)

(2) Group and Instructor introductions.

(3) Course aims and objectives.

(4) Course outline.

(5) Workshop format:
   a) Questions to be addressed in session
   b) Session aims and objectives
   c) Theory
   d) Practice
   e) Application
   f) Understanding

(6) Group expectations.

(7) Session (1) aims and objectives.

(8) Introduction to exercise adherence, motives for participation, and individual, social and contextual strategies. Values clarification / decision balance sheet, enlisting social support, and the implementation process.

(9) Introduction to unsupervised health related aerobic exercise and local route-planning around workplace facilities.

(10) Feedback, discussion, summary.

GUIDELINES: SESSION GUIDE (2) <u>PLANNING AND PREPARATION</u>

Goal setting, self-monitoring, and time management.

(1) Questions from previous session to be addressed.

(2) Session (3) aims and objectives.

(3) Goal setting introduction.

(4) Effective and ineffective goal setting and performance.

(5) Product and process goals.

(6) Principles of goal setting.

(7) Goal setting procedure.

(8) Self-monitoring and goal setting.

(9) Goal setting exercises:

  a) Exercise and sport goals - group work
  b) Life goals (physical, mental, social, family, personal
              lifestyle) - group work
  c) Health goal setting sheet - personal
  d) Exercise goal setting - personal
  e) Life goals - personal

(10) Introduction to Time Management.

(11) Prioritizing and timetabling exercise - personal.

(12) Feedback, discussion, summary.

GUIDELINES: SESSION GUIDE (3) <u>PHYSICAL FITNESS AND SELF-MONITORING</u>

(1) Questions from previous session to be addressed.

(2) Session (2) aims and objectives.

(3) What is health? - discussion and summary.

(4) Total fitness defined.

(5) Physical fitness defined on a continuum.

(6) Who is physically fit?

(7) The components of physical fitness.

(8) Suppleness, strength and stamina (SSS):
    a) defined
    b) requirements in everyday life - Group work
    c) training for improvement

(9) Principles of training.

(10) Incorporating SSS exercise into an active lifestyle - Group work.

(11) Physical, mental and social benefits of exercise - Group work. Why Brisk Walking ?

(12) Self-monitoring the body's response to exercise via resting, working and recovery pulse rates. Borg scale of perceived exertion. Activity diaries. Practical.

(13) Motivational prompts and brisk walking.

(12) Feedback, discussion, summary.

GUIDELINES: SESSION GUIDE (4) WEIGHT MANAGEMENT FOR ACTIVE LIVING

(1) Questions from previous session to be addressed.

(2) Session (4) aims and objectives.

(3) What is ideal weight

(4) Factors affecting the energy balance.

(5) Active living and energy expenditure.

(6) Healthy eating.

(7) Strategies for healthy workplace eating.

(8) Measuring body composition.

(9) Weight management planning.

(10) Feedback, discussion, Summary.

GUIDELINES: SESSION GUIDE (5) <u>STRESS AND RELAXATION</u>

(1) Questions from previous session to be addressed.

(2) Session (5) aims and objectives.

(3) What is stress? - Task sheet

(4) Fight or flight.

(5) Stages of stress.

(6) Stress and illness.

(7) Stress, thoughts, feelings and behavior.

(8) Measuring stress.

(9) Arousal management and performance.

(10) Introduction to relaxation.

(11) Relaxation methods and practice.

(12) Stress management strategies.

(13) Exercise and tension control.

(14) Feedback, discussion, Summary.

GUIDELINES: SESSION GUIDE (6) MENTAL SKILLS FOR ACTIVE LIVING

(1) Questions from previous session to be addressed.

(2) Session (6) aims and objectives.

(3) Imagery defined and introduction.

(4) Imagery types.

(5) Imagery mechanisms

(6) Uses of imagery.

(7) Imagery practice.

(8) Imagery, mood states and exercise participation.

(9) Imagery practical

(10) Focusing and exercise participation

(11) Positive thinking and exercise

(12) Feedback, discussion, summary.

**GUIDELINES: SESSION GUIDE (7)   EVALUATION STRATEGIES ACTIVE
LIVING**

(1) Questions from previous session to be addressed.

(2) Session (7) aims and objectives.

(3) Evaluation and motivation

(4) Evaluation/ reflection startegies for exercise adherence.

(5) Feedback, discussion, summary.

GUIDELINES: SESSION GUIDE (8) APPLIED STRATEGIES: THE EXERCISE GAME-PLAN

(1) Questions from previous session to be addressed.

(2) Session (8) aims and objectives.

(3) Obstacles and strategies during the preparation, action and recovery stages of exercise participation.

(4) Group-problem solving exercise. Develop a strategic model for exercise adherence.

(5) Motivation, self-efficacy and the implementation process.

(6) Course quiz and discussion.

(7) Profiling of exercise behavior questionnaire.

(8) Course evaluation.

APPENDIX B

EXERCISE BEHAVIOR QUESTIONNAIRE

AGE..........   MARITAL STATUS...........

SEX.........   NO. OF CHILDREN...........

NO. OF YEARS IN POST SECONDARY EDUCATION.................

OCCUPATION..............................

STAGES OF EXERCISE BEHAVIOR CHANGE

(1) Please respond to the following questions by placing the appropriate number in the boxes which describes your feelings about physical activity.

(1) Strongly Disagree
(2) Disagree
(3) Uncertain
(4) Agree
(5) Strongly Agree

(a) I currently do not exercise, and I do not intend
   to start exercising in the next 6 months.   ......

(b) I currently do not exercise, but I am thinking
   about starting to exercise in the next 6 months.   ......

(c) I currently exercise some, but not regularly.   ......

(d) I currently exercise regularly, but I have only
   begun doing so within the last 6 months.   ......

(e) I currently exercise regularly, and have done
   so for longer than 6 months.   ......

(f) I have exercised regularly in the past, but
   I am not doing so currently.   ......

* Regular exercise = 3 or more times per week for 20 minutes or more each time.

EXERCISE FREQUENCY

2) Considering the last 7-Day period, how many times have you participated in the following kinds of activities for more than 15 minutes during your leisure-time.

a) Please circle the activity(s).
b) Indicate the frequency of participation in the last 7-days.
c) Indicate the total number of minutes that you have
    participated.

	Times per week	Total Number of minutes
Strenuous Exercise **(heart beats rapidly)**		
i.e.		
running	....	....
jogging	....	....
hockey	....	....
soccer	....	....
squash,	....	....
basketball,	....	....
cross country skiing	....	....
judo	....	....
roller skating,	....	....
competitive cycling	....	....
competitive swimming,	....	....
aerobics,	....	....
step class,	....	....
fitness class,	....	....
Moderate Exercise **(not exhausting)**		
i.e.,		
brisk walking,	....	....
baseball	....	....
tennis	....	....
cycling,	....	....
swimming,	....	....
volleyball	....	....
badminton	....	....
popular and folk dancing	....	....
exercise bicycle	....	....
stairmaster	....	....
Mild Exercise **(minimal effort)**		
i.e.,		
yoga	....	....
bowling	....	....
golf	....	....
easy walking	....	....

EXERCISE SELF-EFFICACY

(3) Using the following scale as a yardstick, please answer the questions below.

0	1	2	3	4	5	6	7

| Does not apply to me | Not at all confident | | | Moderately confident | | | Very confident |

I am confident I can participate in regular exercise when:

a. I am tired.   ......

b. I am in a bad mood.   ......

c. I feel I don't have time.   ......

d. I am on vacation.   ......

e. It is bad weather.   ......

* Regular exercise = 3 or more times per week for 20 minutes or more each time.

APPENDIX C

LEARNING EXPERIENCE EVALUATION FORM

	What I Liked	What Could be Improved

PROCESS

To what extent were you
actively involved in
the learning process,
E.g. an opportunity to
plan, do, reflect and
think critically.

What did you think about
the presentation of the
learning experience
E.g., interesting,
relevant, enjoyable,
variety, motivating,
personalized, clarity,
instructor-enthusiasm?

LEARNING OUTCOMES

What did you learn from
this experience?

Do you feel more
confident that you can
apply this info' to
your own situation?

**Additional comments or
suggestions?**

<u>Post-Program (6-Week) Evaluation Form</u>

<u>LIFESTYLE SKILLS MOTIVATION PROGRAM</u>

PLEASE RATE YOUR LEVEL OF SATISFACTION WITH THE DEGREE TO WHICH EACH OF THE COMPONENTS OF THE LIFESTYLE SKILLS MOTIVATION PROGRAM IMPROVED YOUR CONFIDENCE/ABILITY TO OVERCOME BARRIERS AND PARTICIPATE IN REGULAR EXERCISE.

10 = Extremely Satisfied

5 = Satisfactory (average)

0 = Extremely Dissatisfied

(1) An awareness of <u>individual</u>, <u>social</u> and <u>environmental</u> factors that influence participation in regular exercise
    0 1 2 3 4 5 6 7 8 9 10

(2) Planning strategies (workplace networking, goal setting, time management, preparation and prompts)
    0 1 2 3 4 5 6 7 8 9 10

(3) Stress management and tension control strategies
    0 1 2 3 4 5 6 7 8 9 10

(4) Mind skills: Imagery and Focusing strategies
    0 1 2 3 4 5 6 7 8 9 10

(5) Evaluation strategies (self-reflection, self-monitoring progress)
    0 1 2 3 4 5 6 7 8 9 10

(6) Group work problem solving activities and critical thinking
    0 1 2 3 4 5 6 7 8 9 10

(7) Handout Materials
    0 1 2 3 4 5 6 7 8 9 10

(8) Course Instructor
    0 1 2 3 4 5 6 7 8 9 10

(9) Classroom and facilities
    0 1 2 3 4 5 6 7 8 9 10

* Please return to either Keith Moran (Brock Hall) or Diana Pammenter (Conferences)

THANK YOU.

APPENDIX D

Semi-Structured Interview Format

<u>Pre-Call</u> Re: best time to call you back for a 15-45 minute discussion about the course and what you have been doing.

Singular or multiple calls

Introduction, confidentiality, please be honest and frank.

Social contextual factors

- Can you tell me a little about your situation in terms of its impact on your participation in exercise?
- What would you describe as your main barriers then?
- Summary clarification

Individual factors

- Why did you attend the program?
- Have you known or done anything like this before?
- What do you think you got out of the course...knowledge, attitudes, skills?(exercise diary prompt and cross-check)
- How do you think that what you have gained from the course has been reinforced?
- Summary clarification

Educational experience

- Did you miss any sessions?
- What did you think about the course?...the course material, learning activities, delivery, venues that we were located?
- What did you like best, what improvements or changes would you suggest?
- Summary clarification

Process of application

- What sort of physical activity do you do (type, frequency, intensity, duration, regularity)?
- Have any aspects of the course helped you in anyway with this? (list strategies and topics), - Which?
- How did you use them...before, during and after exercise? (exercise diary prompt and cross-check)
- Why do you think that this/these are useful to you?
- Summary clarification

Alternative outcomes

- Did anything else come out of the course either for yourself or for the workplace?
- Summary clarification

Thanks for your time. This has been very helpful to improve future courses. Good luck with your active living!

APPENDIX E

Journal Entry Form

UNDER-STANDING	MACRO-PLANNING	MESO-PLANNING	MICRO-PLANNING	ACTION / MIND SKILLS	SELF-MONITOR
* Health & Wellness * Active Living * Fitness * Weight Control * Stress - Management * Heart Disease Prevention * Back Care & Injury Prevention * Fitness Consumerism	* Needs Assessment / Situational Analysis * Awareness * Importance * Incentives * Preferences * Opportunity * Barriers	* Goal Setting - Current Status long, Intermediate, short term	* Time-Management * Priorities * Weekly Schedule * Daily Schedule * Preparation - What - Where - When - How - Balance - Variety - Fun - Social Support - Plan "B" (Disruptions) * Visual / Poster Prompts	* Tension Control * Imagery * Focusing * Positive Thinking * Confidence	* Visible Action Plan * Progress toward goals * Diary Prompts * Heart Rate Monitoring * Perceived Exertion *Thoughts /feelings/ Enjoyment * Social Support * Re-Planning
C R I T I C A L T H I N K I N G					

WEEK	MON	TUES	WED	THURS	FRI	SAT	SUN	MOTIVATION STRATEGIES
E.G.,		30 min. lunch hour walk/Jog		15 min Walk 20min Swim	Fitness room 15m		20 min Beach walk	Time management scheduling weekly + daily. Imagery → problem solving workday → relaxing on beach self-monitoring diary prompts and physical appearance.

Personal Lifestyle Needs Assessment

LIFESTYLE GOAL(S) FOR JANUARY:

LIFESTYLE GOAL(S) FOR THE NEXT 4 WEEKS:

LIFESTYLE GOAL(S) FOR NEXT WEEK:

FAVOURITE ACTIVITY = ...

FROM THE FOLLOWING RANK ORDER YOUR MOTIVES FOR PARTICIPATING IN PHYSICAL ACTIVITY:
Health and Fitness ( ), Fun and Enjoyment ( ), Relaxation and Tension Control ( ), Social ( )
Weight Management and Appearance ( ), Challenge and Achievement ( ), Competition ( )

IF I PARTICIPATE IN REGULAR EXERCISE, THE BENEFITS TO ME ARE::

PRACTICAL OPPORTUNITIES & VENUES FOR ME TO FREQUENTLY PARTICIPATE IN MY FAVOURITE ACTIVITY:

Personal Lifestyle Planner

	WK (1)	WK (2)	WK (3)	WK(4)
M				
T				
W				
Th				
F				
Sa SU				

APPENDIX F

Questioning strategies for facilitating critical self-directed learning

INTRODUCTION
Recap last session through questioning
What questions do you have about today's topic?
What have you previously done, heard about or know about today's topic?
What have we done so far that might help us with learning today's topic

PLANNING PHASE
Can you think of ways to ...?
What series of steps would you take to ...?
How would you go about ...?
Develop a plan to ...
From the following..., select...
What strategies would you use to ...?
How many different ways are there to ...?
When do you think is the best time to ...?

ACTION PHASE
Can you make a ...?
Try a unique ...
Can you add to this by ...?
Can you find another way to ...?
How can you vary your ...?
See if you can ...
Find a new way to ...
Is it possible to ...?

EVALUATION PHASE
What role models do you associate with this ...?
What is this similar to ...?
What are the barriers to ...?
Who would find this more difficult/easier than others ...?
Why do you think that some ways are better than others ...?
What did you learn from this experience...?
How did you feel when ...?
What do you like best about your ...?
How would you improve ...?
What would you change next time ...?
What would happen if ...?

SUMMARY
How would you explain to a friend outside of this class what we did today?
Name three things from today's session that you think are important
What is not clear about today's session?
What do you need to do to develop further on this topic?....How?
I'd like you to consider these questions before we start the next session (research, reflection)

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Faculty of Graduate Studies
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Vancouver, B.C. Canada V6T 1Z4

Tel: (604) 822-2258
Fax: (604) 822-9210

<u>**Health Promotion in the Workplace: Evaluation of a Lifestyle Skills Motivation Program**</u>

CONSENT FORM

You have the right to refuse to participate as well as withdraw from this study at any time. If you refuse or withdraw it will in no way jeopardize your employment status. This consent form does not commit you to attend all of the health classes.

Confidentiality will be maintained by providing each individual with a number. Only that number will appear on completed questionnaire information.

Any inquiries concerning the procedures with respect to the course content or evaluation processes can be addressed to the Course Instructor at any time.

I, ... understand the purpose of this study and I consent to
       (Please Print)

take part in the Lifestyle Skills Motivation Program and complete the evaluation processes

as specified in the Description of Project. I have received a copy of the consent form

including the attached description of this research project.

Signed: ....

Date: ....

Established April 1990 to provide a UBC focus for multidisciplinary research, education and consultation in health promotion