

Exploring the Factors Associated with Sustaining Physical Activity in Individuals At-Risk  
for Type 2 Diabetes

by

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### Abstract

The purpose of this qualitative study was to examine factors that influence continued participation in physical activity for people of low income, a population that is at-risk of developing type 2 diabetes, and the relationship between these factors. This inquiry utilized a case study research design guided by an ecological model of physical activity. Intensity sampling was used to select participants who had completed a healthy living program with the Saanich Peninsula Diabetes Prevention Project (SPDPP). The methods used included semi-structured interviews and a community self-portrait. Thematic coding and analysis of data were facilitated with the use of NVivo software. Data revealed five themes based on factors encouraging and inhibiting continued participation in activity that are centred around the concepts of social capital and the ecological model. Suggestions are provided to encourage physical activity for people of low income and implications for future policy, research and practice are discussed.

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## Dedication

To my parents, Harvey and Joann Rickert, who encouraged me to 'aim high' and have supported my endeavours endlessly. Their passion for life and learning is inspiring.

## Chapter 1

### Introduction

In order to explain factors influencing health, behavioural theories must be placed in the broader context in which individuals are living (Nutbeam & Harris, 1999, p. 7). While these theories contribute to our understanding of individual behaviour and much is known about the effects and extent of individual characteristics (knowledge, attitude and skills) that are associated with adopting and maintaining physical activity (Baker, Brennan, Brownson, & Houseman, 2000), there is a need to consider sociocultural and environmental influences on behaviour change and the impact of these factors have on increasing participation in physical activity. Disease prevention and health promotion interventions regarding physical activity are often plagued by the “paradox of self-responsibility: Even if we know the power of regular physical activity with respect to physical and mental health benefits, formidable barriers may reside in our work, family, neighborhood, and cultural circumstances” (McGinnis, 2001, p. 393). This is supported by Wing et al. (2001) who state that the current environment is not conducive to healthy eating and physical activity and this may explain the poor maintenance of these behaviours.

An ecological model is a conceptual framework that considers multi-level influences on behaviour including intrapersonal, interpersonal, environmental, and policy determinants. “Research on the correlates of physical activity has established that variables in all the domains (intrapersonal, social and cultural, and physical) are related to physical activity in adults” (Sallis & Owen, 1997, p. 417). Physical environment characteristics have been the least thoroughly studied influence on physical activity (Sallis, Johnson, Calfas, Caparosa, & Nichols, 1997), so it is a high priority to further explore environmental variables. Environmental approaches to

increasing physical activity provide opportunities, support and cues to develop healthier behaviours (Kahn et al., 2002). This chapter will begin with a review of the type 2 diabetes epidemic, physical inactivity and obesity. The role of the built environment influencing physical activity will be discussed in Chapter 2.

### *Background*

#### *Type 2 diabetes epidemic.*

The prevalence of diabetes in 2000-2001 was estimated at 1.1 million, equivalent to 4.5% of Canadians aged 18 or older (Millar & Young, 2002). One in twenty Canadians has been diagnosed with diabetes by a health professional and the prevalence of diagnosed diabetes among people 45 years of age and older has increased by 25%, from 6.6% in 1994-1995 to 8.2% (CFLRI, 2004). Approximately 5.1% of British Columbians have diabetes and that number is expected to rise to 7.1% by 2010, however these figures are low since the number of people with undiagnosed diabetes is unknown (Auditor General of British Columbia, 2004). Also, the prevalence of type 2 diabetes is higher among Canadians living with low incomes, and the health of people with diabetes is often compromised by other medical problems such as hypertension, stroke and cataracts (James, Young, Mustard, & Blanchard, 1997). The economic burden of diabetes was 1.6 billion dollars in 1998, which is a conservative value given that the economic costs of illness associated with diabetes (e.g. cardiovascular disease, renal failure) were not included in the calculations. It is speculated that the real economic cost of diabetes in Canada may be as high as \$13 billion annually (Health Canada, 2002a). In British Columbia, the cost of hospital, pharmaceutical and medical services to diabetics is over \$760 million per year, approximately one-sixth of total expenditures on these services (Auditor General of British Columbia, 2004).

People with type 2 diabetes have increased risk of mortality and morbidity from cardiovascular diseases. In a population-based study of 13 000 men and women with a follow up of 20 years, it was found that in people with type 2 diabetes the risk of having a myocardial infarction or stroke was increased 2- to 3-fold and the risk of death was increased 2-fold, independent of other risk factors for cardiovascular diseases (Almdal, Scharling, Skov Jensen, & Vestergaard, 2004). The number of deaths due to diabetes is increasing in Canada, totaling more than 7, 800 in 2002, which is an increase of 10.9% from 2001, and 75.8% compared to 1992 (Statistics Canada, 2004a). Increased mortality rates and socio-economic disparities in diabetes are evident and since the mid 1980s there have been considerably greater mortality rates due to diabetes for Canadians living in low income urban neighbourhoods (Wilkins, Berthelot, & Ng, 2002).

Type 2 diabetes is a chronic disease or metabolic disorder that results from the body's inability to properly secrete and use insulin (Health Canada, 2002a). Insulin is a hormone that is essential for the proper use of the energy contained in the food we eat. Type 2 diabetes was previously known as non-insulin dependent diabetes (NIDDM) or 'adult-onset diabetes' and the term 'type 2 diabetes' is now used to describe diabetes characterized by insulin resistance and inadequate compensatory insulin secretory response (Centers for Disease Control [CDC], 2004a). Type 2 diabetes accounts for 90% to 95% of all diagnosed cases of diabetes (Health Canada, 1999). Type 2 diabetes is attributed at least in part to sedentary living and obesity (Canadian Fitness and Lifestyle Research Institute [CFLRI], 2002), thus the primary modifiable risk factors for type 2 diabetes are excessive body weight and physical inactivity (Health Canada, 1999).

*Physical inactivity and obesity.*

Presently, the prevalence of physical inactivity is high and active lifestyles is low (Health Canada, 2004). Fifty-seven per cent of Canadian adults are insufficiently active for optimal health benefits (CFLRI, 2002) and 56% are physically inactive (CFLRI, 2004). Categories include: active (3 kilocalories/kilogram/day (KKD) which is equivalent to 60 minutes of brisk walking), moderately active (1.5 KKD or 30 minutes of brisk walking per day), or inactive (0 to 1.4 KKD). As well, Canadians face increased risk of chronic disease and premature death due to physically inactive lifestyles regardless of the fact that they express the desire or intention to become more physically active (Health Canada, 2002a). Economic analysis in 1999 revealed that \$2.1 billion in direct health care costs were credited to physical inactivity. A 10% reduction in inactivity rates could reduce direct health care expenditures by \$150 million a year (Katzmarzyk, Gledhill, & Shephard, 2000). The annual cost of inactivity in British Columbia is estimated at \$422 million (Colman & Walker, 2004). This consists of \$175.7 million per year in direct costs to the health care system and \$236 million in indirect productivity losses due to premature death and disability.

Approximately 3.3 million Canadians were obese in 1998 (Katzmarzyk, 2002) and the prevalence of obesity continues to increase (Health Canada, 2003a). The scientific definition of obesity is a Body Mass Index (BMI) greater than or equal to 30.0 and the definition of overweight is a Body Mass Index of 25.0-29.9 (CDC, 2004b). Physical activity contributes to and is important to maintaining weight loss and it is extremely helpful for the prevention of obesity and overweight (CDC, 2004d). Weight loss from diet and increased physical activity may also lower diabetes risk by increasing the body's ability to use insulin and glucose more efficiently (National Institute of Diabetes & Digestive & Kidney Diseases, 2003). Physical

activity has been shown to reduce the risk of developing type 2 diabetes by as much as fifty percent (Manson et al., 1991). In Canada, the proportion of people who are active in their leisure time has grown, however the proportion of people who are obese has also increased (Statistics Canada, 2002). Although there has been a reduction in the level of physical inactivity (decreased by 10% over the six-year period from 1994/5 to 2000/01) the majority of Canadians are physically inactive and the proportions of overweight and obese Canadians are increasing, suggesting that total physical activity in people's lives may be decreasing (CFLRI, 2004). Also, increased activity rates are not uniform, whereby seniors and people of low income who were the least active in 1994/95 have fallen further behind other age and income groups (CFLRI, 2004). There is a strong association between socioeconomic status and participation in physical activity, whereby lower levels of activity are reported among individuals with lower levels of education, income, and occupational prestige. These low levels of activity contribute to their higher morbidity and mortality rates for chronic degenerative conditions such as type 2 diabetes (Burton, Turrell, & Oldenburg, 2003).

Lifestyle modification programs typically focus on individual behaviour change and neglect environmental factors influencing health (Leung, Yen, & Minkler, 2004; Stokols, 1996). However, behaviours exist within environmental and social contexts where influencing factors are largely out of individual control (Raine, 2004; Rychetnick & Wise, 2004). Moreover, social epidemiological evidence argues that lifestyle risk factors account for only 10-20% of mortality (Lantz et al., 1998; Wilkinson & Marmot, 1998) which are tied to culture and socio-economic status (Rychetnick & Wise, 2004). Thus, traditional, individually focused physical activity interventions can be limited in nature. As supported by Raine (2004), in reviewing obesity determinants (which includes physical inactivity), there is a need for a broader change in social

environments. Raine (2004) suggests that “intersectoral collaboration and community participation are essential to ensure that programs are sustainable, tailored to meet local needs, able to reach more than just the motivated healthy, and prepared to capture local opportunities” (p. 61).

Health surveys, studies, theories and interventions have influenced a change in focus from vigorous to moderate physical activity recommendations for health outcomes (Dubbart, 2002). Recognizing that high intensity activity may not be a realistic goal for everyone and that the term “exercise” brings up negative images and emotions, health strategies (interventions and research) are shifting from a focus on individual motivation for vigorous exercise to increasing population-wide energy expenditure through moderate-intensity activities, such as walking, in the context of everyday life (Pikora, Giles-Corti, Bull, Jamrozik, & Donovan, 2003; Owen, Leslie, Salmon, & Fotheringham, 2000). For example, Health Canada (2003d) developed a ‘Stairway to Health’ program to get employees active in the workplace. This program includes a review of studies examining stair interventions, magnitude of physical activity change, and factors influencing stair use. The research summary concluded that most studies found statistically significant increases in stair use. In high-use situations, such as shopping malls and airports, an increase of three to four percent in the number of people using stairs can work out to thousands of active people. Stair climbing significantly contributes to accumulating 30 minutes of daily physical activity.

Health Canada (2004; 2003a) recommends accumulating 30 to 60 minutes (can be in ten minute bouts) of moderate intensity (around 50% of maximal capacity) physical activity on most (preferably all) days of the week for sedentary people to realize significant health benefits. The CDC (2004c) recommends that adults engage in moderate-intensity physical activities for at least

30 minutes five or more days of the week. Health Canada (2003a) recommends engaging in flexibility and endurance activities (beginning with light activity and progressing to moderate and vigorous activity) four to seven days of the week and strength activities two to four days of the week.

### *Rationale*

There is evidence that type 2 diabetes can be prevented or delayed through lifestyle modification (Segal, Dalton, & Richardson, 1997). What remains to be studied is how and if type 2 diabetes prevention programs influence longer term behaviour change. Few primary prevention programs for type 2 diabetes appear to be built on a theoretical framework supporting a coordinated approach of achieving longer-term behaviour change of individuals or community policy and structural changes (Rosenberg & Lawrence, 2000). Gaps in knowledge include the effectiveness of diabetes prevention and control strategies (Health Canada, 1999) and due to increasing rates of diabetes and obesity, rates of activity have not been sufficiently regular to influence the onset of diabetes and offset the increased prevalence of overweight and obesity (CFLRI, 2002). Physical activity interventions can result in increased physical activity, but these changes are often small and temporary (Van der Bij, Laurant, & Wensing, 2002). However, interventions can be informed through the identification of factors associated with the choice to participate in physical activity or sedentary behaviours (Salmon, Owen, Crawford, Bauman, & Sallis, 2003). This research will examine factors influencing continued participation in physical activity for people at-risk for type 2 diabetes.

Health promotion focuses on raising the health status of individuals and communities and health determinants have social, environmental and economic aspects (Ewles & Simnett, 1992). Thus, health promotion is an interdisciplinary field (MacDonald, 1998) involving support from

educational, organizational, political, economic, environmental contexts and individual and societal perceptions of health and wellness. For the success of and adherence to type 2 diabetes prevention programs and for long-term individual physical activity behaviour change, interventions must involve individual aspects and address larger social and community dynamics and influences. Thus, interventions and solutions to problems must be targeted to a number of determinants and multi-levels simultaneously (Baker et al., 2000; McKinlay & Marceau, 2000). Research must identify modifiable environmental determinants and evidence-based intervention strategies for whole populations (Owen et al., 2000). There has been little research on environmental and cultural factors related to physical activity (Wing et al., 2001), thus physical activity research may benefit from the application of ecological models and environmental approaches to physical activity (Sallis & Owen, 1997; King et al., 1995).

An ecological approach to health provides a framework for understanding the interrelationships between personal behaviour and environmental conditions in health, recognizing the interplay between the individual (intrapersonal determinants such as knowledge, skills, attitudes; cognitive, affective and behavioural processes) and his/her social and physical environment (social networks, communities, public policy) and well-being (Stokols, 1996). Raine (2004) argues in support of evidence suggesting that the most effective interventions to change physical activity behaviours incorporate individual, community, environmental, and policy levels.

*Summary.*

Upstream public policy interventions focus on the underlying reasons for the social patterns of disease and the social determinants of health (e.g. social support, addictions, social exclusion, unemployment) and are directed at entire populations. Support is needed for upstream

efforts, which are changes in the cultural, social and economic environments where small improvements in everyone's health will yield greater gains for society (McKinlay & Marceau, 2000). Downstream approaches have a curative focus and midstream includes primary and secondary prevention programs. A balanced whole-population public health approach to diabetes must involve interventions on all three levels simultaneously (McKinlay & Marceau, 2000).

### *Purpose*

Risk factors for type 2 diabetes include: age (over 65, although diabetes is occurring in children), obesity, apple shaped figure (i.e. carry most of your weight above the hips), sedentary lifestyle (i.e. physically inactive and overweight), family history, Aboriginal, African, Hispanic or Asian descent, gestational diabetes or gave birth to a baby over 4kg, high cholesterol, high blood pressure, and impaired glucose tolerance (Health Canada, 2003b). Socioeconomic factors (i.e. education, income, occupation, area of residence) heavily influence the adoption of healthy behaviours (Giles-Corti & Donovan, 2002a); individuals living with lower incomes and less formal education are more likely to be physically inactive and overweight (Health Canada, 2002a), increasing their risk for type 2 diabetes. As people's income levels increase, the proportion of those who are physically inactive decreases (CFLRI, 2002) and particular groups such as people with low incomes who were the least active in 1994-1995 have fallen further behind other age and income groups (CFLRI, 2004). Income is positively associated with physical and mental health (Ziersch, Baum, MacDougall, & Putland, 2005) and type 2 diabetes is more common among the poor and excluded. Thus people of low income are considered at-risk because of their living circumstances and conditions shaping their lifestyle choices (Raphael et al., 2003).

There appears to be a gap in the literature with a lack of published research on type 2 diabetes prevention program adherence. Questions remain: “Why do some people adhere to diabetes prevention programs and others do not?” “Which factors in a diabetes prevention program are associated with or improve program adherence?” Given the current rates of diabetes, physical inactivity and obesity, these questions need to be considered.

Also, given the multifactorial risk factors of diabetes and the complexity of lifestyle and behaviour changes, prevention programs both in design and implementation must address multiple levels, involving individual, interpersonal and community factors. This study provides information on behavioural habits and factors influencing physical activity levels among individuals on the Saanich Peninsula living with low incomes. Findings will be discussed to further develop an understanding of particular population needs, and enhance our grasp of environmental influences. Future implications could involve tailoring programs and services to meet the needs of people with low incomes and improve environments to better support physical activity.

Factors relating to physical activity need to be put into action differently in different communities therefore, methods that allow local residents to define measures and take part in research are useful. Thus, it is anticipated that this research will be a strong addition to the physical activity literature. A case study research design was used and for the purposes of this study, data collection, analysis and interpretation followed a heuristic orientational qualitative inquiry (Patton, 1990) using thematic analysis of data (Flick, 2002) in the context of the ecological model. Participants have completed a healthy living program with the Saanich Peninsula Diabetes Prevention project (see Appendices B and C) and are of a population that is considered at-risk for type 2 diabetes.

### *Statement of Interest*

How can physical activity practices be encouraged and sustained for low income persons based on participants' lived experiences?

### *Research Questions*

1. What are participants' perceptions and understandings of intrapersonal, interpersonal and community factors that positively and negatively influence continuation in participation in physical activity for persons living with low incomes?
2. What described relationships exist between intrapersonal, interpersonal and community factors influencing participation in participation in physical activity, based on participants' experiences?
3. What are participants' perceptions and experiences of physical activity following an intervention (i.e. healthy living program) designed to enhance capacity for healthy living?

### *Assumptions*

Assumptions of qualitative research include 1) aspects of reality that cannot be quantified and 2) it is important to understand how people make sense of the world, that is individual subjectivities are accepted as realities of the social world (Locke, Spirduso, & Silverman, 2000). It is also assumed that the researcher's individual perspectives and values will become part of the research process and influence data collection and analysis. The researcher's perspectives are explained in the methods section and assumptions inherent in the ecological model are explained in the review of literature.

### *Delimitations*

This study will attempt to provide information on the experiences of particular participants, and through careful documentation of this inquiry process, it is hoped that others

might ask, “With further knowledge of the factors and theories influencing physical activity, how might activity continue to be effectively promoted and supported?” Case studies are generalizable to theoretical propositions (Yin, 1984) and a rigorous case study approach increases the confidence of researchers that the cases are accurate and comprehensive (Patton, 1990). Though the intent of interpretive research is not to generalize findings (Glover, 2004b) thus results are not intended to be generalized to all other populations at-risk for type 2 diabetes or all people of low income -it is anticipated that through a rigorous inquiry process the findings will be applicable in other contexts or with other people at risk for type 2 diabetes in similar life situations. Details about the SPDPP and healthy living program and methods used have been provided so that the reader can “establish the degree of ‘transferability’ of the findings from the case studied to the case to which the findings might be transferred” (Glover, 2004b, p. 69).

### *Limitations*

The limitations of this study include:

1. The study was influenced by the operation of the SPDPP programs therefore, the number of interviews conducted were influenced by the number of participants from the particular at risk population who completed a program and were willing to participate in this study.
2. Study results were based on self-reports of individuals (Burton, Turrell, & Oldenburg, 2003) and studies frequently show that self-reported physical activity (i.e. in interviews) can be over-reported (Sallis & Saelens, 2000). Further, with data based on perception there is a limited ability to generalize to the broader community (Brennan, Baker, Haire-Joshu, & Brownson, 2003). Reliance of self-reports on environmental variables is a limitation (Sallis et al, 1997) however, it is important to develop measures of perceived environments so they can be compared to objective assessments. Less expensive self-report measures can be included

in more studies, thus allowing for an evaluation of environmental influences in a variety of populations and locations, although a thorough understanding requires both self-report and objective measures (Sallis et al, 1997).

### *Definitions of Terms*

1. *Diabetes*: a chronic disease that develops when the body has a problem either making or using a hormone called insulin. Insulin helps to regulate the amount of sugar in the blood (glucose) (Heart & Stroke Foundation of Canada, 2002).
2. *Type 2 diabetes*: a form of diabetes where the body may make enough insulin but it is unable to use it correctly (Heart & Stroke Foundation of Canada, 2002).
3. *Ecological model of health behaviour*: A model which posits that behaviours are influenced by intrapersonal, interpersonal (social and cultural), and environmental variables (physical environment, community, policy); posits that these variables are likely to interact; and describe multiple levels of individual, social and environmental variables as relevant for understanding and changing health behaviours (Baker et al., 2000; Sallis & Owen, 1997).
4. *Saanich Peninsula*: Located on South Vancouver Island, British Columbia, Canada, composed of three municipalities with a population of approximately 40,000 (Capital Regional District, 2004).
5. *Saanich Peninsula Diabetes Prevention Project (SPDPP)*: A federally funded participatory action research project exploring the influence of recreation on the prevention of type 2 diabetes in populations at risk on the Saanich Peninsula (see Appendix B). The SPDPP offers ‘A Taste of Healthy Living’ programs to those at risk for type 2 diabetes (see Appendix C).

6. *Low income*: For the purposes of the SPDPP and this research study, participants were self-defined as living with low income. However, programs were promoted through Peninsula Community Services<sup>1</sup> whose programs target BC benefits/income assistance clients (i.e. those current or previous recipients of EI benefits). Variations of definitions exist in the literature, and terminology is often used interchangeably (e.g. poverty, low income, socioeconomic status) and not always clearly defined. Although Canada has no ‘official’ definition of poverty the Statistics Canada measure of poverty is likely the best known with its defined set of cut-offs (Canadian Council on Social Development, 2000).<sup>2</sup>
7. *Physical activity*: Leisure and non-leisure body movement produced by skeletal muscles that results in an increased energy expenditure (Health Canada, 2003c).
8. *Social capital*: A much debated concept in the literature (Cattell, 2001; Kawachi, Kim, Coutts, & Subramanian, 2004; Newton, 1997; Szreter & Woolcock, 2004) that has been defined as features of “social organization such as networks, norms, social trust that facilitate coordination and cooperation for mutual benefit” (Putnam, 1995, p. 67).

### *Implications*

Findings will be used to understand particular population needs. Future implications could involve tailoring programs, services and healthy public policy to meet the needs of these populations, and the development of further understanding of environmental influences. This

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<sup>1</sup> Peninsula Community Services is a community agency that focuses on meeting the health and social needs of residents living on the Saanich Peninsula and Gulf Islands. It provides services in the areas of child, family and mental health, employment, volunteering, and home support ([www.peninsulaservices.com](http://www.peninsulaservices.com)).

<sup>2</sup> Low Income Cut-offs (LICO) after tax for one person (size of family unit) for 2003 categorized by community size were \$10,718 in rural areas and in urban areas less than 30,000 people; \$12,389, 30,000 to 99,999 people; \$13,558, 100,000 to 499,999 people \$13,771 and 500,000 and over \$16,348 (Statistics Canada, 2004b).

would then lead to improvements in community environments (social and physical) designed to better support physical activity. Environmental changes and practice reflect the types of environmental variables believed to influence health behaviours. However, there is a lack of scientific foundation for many environmental interventions so it is a high priority to explore the many environmental variables that could influence physical activity (Sallis & Owen, 1997).

Findings could also contribute to the improvement of public health, recreation, and exercise/fitness professional training programs by furthering knowledge and understanding of factors influencing chronic disease prevention. Recommendations for future research and implications for policy and practitioners are outlined in the concluding chapter.

## Chapter 2

### Review of Literature

This chapter begins with a brief look at the history of the health promotion movement and influential publications. The purpose of this literature review is to consider why some people are active and others are not, particularly as applied to type 2 diabetes prevention programs. This chapter will review the major research initiatives that have contributed to the evolution of diabetes prevention programs. The relevance of the ecological model to the health promotion field and to physical activity will be described. This overview will also introduce the need for qualitative research using the ecological model in relation to physical activity and the prevention of type 2 diabetes.

#### *History of the Health Promotion Movement*

##### *World health organization.*

In 1945 the concept of health was included in Charter of the United Nations and the establishment of an international health organization was accepted. The World Health Organization (WHO) was formed and its Constitution declared that “the enjoyment of the highest attainable standard of health” was “one of the fundamental rights of every human being” (World Health Organization [WHO], 2002a, para. 1). The World Health Organization’s definition of health is “health is a state of complete physical, mental and social well-being not merely absence of disease or infirmity” (WHO, 2002b, para. 1). The World Health Organization has played a significant role in promoting the preventative aspect of disease and the importance of pursuing all facets of health.

*A new perspective on the health of Canadians.*

The publication *A New Perspective on the Health of Canadians* is commonly referred to as the *Lalonde Report* since it was written under the leadership of Marc Lalonde, the Canadian Minister of Health and Welfare, in 1974 (MacDonald, 1998). This report used the term *health promotion* and introduced the health field concept, which focused on four elements: human biology, environment, behaviour (lifestyle) and access to health services. This document was significant because it presented evidence for the importance of lifestyle and environmental factors as contributors to the health of the population and to preventing disease and disability, and was the first government document to acknowledge that access to health care does not guarantee access to good health. The report was criticized in Canada, however, for its emphasis that Canadians could reduce disability and early death and lower medical bills by taking more responsibility for their health. From this, several areas of health promotion practice emerged: social marketing of lifestyles and behavioural health, health education and promotion programs (e.g. ParticipACTION).

*Ottawa charter for health promotion.*

The Ottawa Charter embraced the World Health Organization's definition of health promotion: the process of enabling people and communities to gain control over and improve their health (WHO, 1986). The Ottawa Charter - a delegate-composed document from the 1<sup>st</sup> International Conference for Health Promotion in 1986 - shifted the focus away from health care services and toward other determinants of health such as environment, living conditions, strengthening and coordinating community health services, and to a lesser extent, lifestyle. The Charter encouraged considering healthy public policy, creating supportive environments, strengthening community action, developing personal skills, and reorienting health services

towards the individual and community needs and towards health research (Pederson, O'Neill, & Rootman, 1994). Health promotion is defined as:

the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the object of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities. Therefore, health promotion is not just the responsibility of the health sector, but goes beyond healthy life-styles to well-being (WHO, 2003, para. 1).

In addition, at the 1<sup>st</sup> International Conference of Health Promotion in 1986, the Canadian Minister of Health and Welfare released the publication *Achieving Health for All: A Framework for Health Promotion* (Epp, 1986). This framework focused on the social, economic and environmental factors influencing health (Health Canada, 2002b). It recognized that disadvantaged groups have poorer health, significantly lower life expectancy and have more disability and that community support is important for coping and health (Epp, 1986).

The Charter and earlier Canadian publications (Lalonde and Epp Reports), and the initiatives from the WHO have been milestones in the health promotion movement. They have defined health promotion, changed health expectations and societal norms, and contributed to changing health policy on a global scale.

#### *Health Research Contributing to Diabetes Prevention Programs*

Research in the health field has contributed greatly to the design and implementation of type 2 diabetes prevention programs. A landmark study in this area will be introduced, as well as

other research that focuses on the modifiable lifestyle factors relating to diabetes prevention and the cost effectiveness of diabetes prevention programs.

*Finnish diabetes prevention study.*

The Finnish Diabetes Prevention Study was a landmark study demonstrating that type 2 diabetes can be prevented with lifestyle changes. Tuomilehto et al. (2001) studied the prevention of type 2 diabetes by comparing a control group to a lifestyle intervention group. The intervention group, 552 middle-aged overweight adults with impaired glucose tolerances, were given individualized counselling for modest weight reduction, improving diet, and increasing physical activity. Results indicated that decreased incidences of type 2 diabetes were directly related to change in lifestyle. After four years the lifestyle intervention group had more than a 50% reduction in diabetes incidence and the group reversed the risk factors for developing diabetes (e.g., overweight, physically inactive, high fat diet). The reduction in incidence was directly related to change in lifestyle of the intervention group. This intervention promoted health and an improved quality of life, and developed a sense of empowerment in individuals.

*Diabetes prevention project.*

A research study entitled the Diabetes Prevention Project (DPP) examined whether modest lifestyle changes (i.e. healthy eating and exercise) or a drug intervention could reduce the development of diabetes in Americans (Diabetes Prevention Program Research Group, 2002). This study was done in order to determine whether findings from the Finnish study would be applicable to the U.S. population and to compare drug treatment (metformin) with behavioural intervention in relation to type 2 diabetes prevention. It was the first major clinical trial of 3234 Americans with impaired glucose tolerances (i.e. at high risk for type 2 diabetes) and found that participants assigned to an intensive program of lifestyle modification (i.e. goals to achieve and

maintain weight reduction through healthy diet and engage in moderate activity for at least 150 minutes per week including curriculum instruction and follow up sessions) reduced their risk of getting type 2 diabetes by 58% and participants with metformin treatment reduced their risk by 31%. Thus, “the lifestyle intervention was significantly more effective than metformin” (p. 393).

A current longitudinal research study that is part of the DPP is examining five factors that may contribute to preventing diabetics from having healthy lifestyles, which factors affect whom, and why (D’Arrigo, 2000). These factors are: 1) perception of personal stress, 2) belief in ability to change eating habits, lose weight and increase physical activity level 3) whether or not one engages in binge eating 4) whether or not one eats when upset (emotional eating), and 5) how much one takes charge over what he/she eats. It is anticipated that these factors and the study outcomes will provide important information to consider when designing, implementing and evaluating of type 2 diabetes prevention programs. However, these factors are focused on individual influences on behaviour. Diabetes has many levels of causation (McKinlay & Marceau, 2000), thus in furthering knowledge in the prevention of this disease there is a need for a broader ecological inquiry in research.

*Multiple risk factor intervention trial.*

Findings from the landmark Multiple Risk Factor Intervention Trial (MRFIT) research project were important because this was the earliest and largest randomized clinical primary prevention trial to test the effect of a multifactor intervention in the prevention of coronary heart disease (CHD) (Gotto, 1997). These data have contributed to our understanding of the large array of risk factors and the interplay between risk factors. The trial cost \$180 million (Syme, 2002). High-risk and motivated men (N=12, 866) volunteered to be randomly assigned to a special intervention group (i.e. treatment of hypertension, counseling for cigarette smoking cessation,

dietary advice for lowering cholesterol levels) or to a control group that was to continue with usual sources of health care in the community and the men were followed for seven years. The overall results of this expensive, rigorously implemented clinical study did not show a beneficial effect on CHD or total mortality from the multifactor intervention (i.e. none of the results were statistically significant) (Multiple Risk Factor Intervention Trial Research Group, 1982). This study contributed to our understanding of the interplay between risk factors (Gotto, 1997). Syme (2002) has reflected about the limitations of addressing only individual risks stating, “one would think that if we informed people of their risks they would rush home and, in the interests of good health, change behaviors that caused the risk. Some people do, but most do not” (p. 64).

*Cost effectiveness of prevention vs. treatment.*

The cost effectiveness of interventions for the prevention of type 2 diabetes has been examined. Segal and colleagues (1997) identified and analyzed five dominant intervention program types (i.e. surgery, group behavioural program, media campaign, general practitioner lifestyle advice, and intensive diet and behavioural programs) to examine the cost effectiveness of primary prevention programs and which of the programs was the most cost effective. The study examined the impact on total life years, gross cost per diabetes year prevented, and cost per life year saved. It revealed that diabetes prevention programs can be highly cost effective. Their findings revealed that these programs can achieve improvement in health status (reducing illness) at little cost and savings in the utilization of health care resources (downstream cost savings). The results are conservative because this study did not examine quality of life. Therefore, findings support primary prevention programs (for people who are at high risk of type 2

diabetes), pilot programs, and the evaluation of existing programs to provide further evidence of the costs and effectiveness of interventions for the prevention of type 2 diabetes.

*Other health research.*

Norris, Engelgau, and Narayan (2001) reviewed the literature associated with the effectiveness of self-management training in type 2 diabetes and found that evidence supports the effectiveness of this training. Although the review focused on people living with and managing diabetes the findings may be relevant to primary prevention programs and long-term behaviour change. In their comprehensive review of diabetes self-management education interventions, Norris et al. (2001) found venues in community gathering places to reach populations not normally accessing clinical or worksite settings, and to be more convenient and comfortable places for learning. The authors found sufficient evidence of effectiveness to recommend that opportunities for self-management education occur in the community.

Lifestyle factors consistent with obesity (weight loss), eating behaviour (proper nutrition), and physical activity have a major role in the prevention and treatment of type 2 diabetes (D'Arrigo, 2000; Wing et al., 2001). Recent progress in the development of behavioural strategies to modify these lifestyle behaviours has been acknowledged, however further research is needed given the increasing obesity rates and the fact that changing behaviour for the long term has proven to be extremely difficult (Wing et al., 2001). Four key topics related to obesity and physical activity that should be given high priority in future research have been identified: 1) environmental factors related to obesity, eating, and physical activity; 2) adoption and maintenance of healthful eating, physical activity, and weight; 3) etiology of eating habits and physical activity behaviours in relation to obesity; and 4) multiple behaviour changes. These topics need to be considered in the design of type 2 diabetes prevention programs and the first

two priorities listed support the need for the proposed study. As well, Satterfield et al. (2003) state that the limitation of many community based prevention studies includes the shortness of intervention duration, thus long term behaviour change must be considered.

In summary, research examining prevention programs has indicated that incidence of diabetes can be reduced by modifying lifestyle risk factors. Yet, there is an extensive literature on lifestyle interventions questioning the success of people changing individual behaviours without addressing the contexts within which such lifestyle changes are made. As well, individually focused behavioural interventions for health promotion and disease prevention have had a relatively small impact; impacting one in four of those who participate (Gillies, 1998). It is acknowledged within the field of public health that social and economic circumstances that are often beyond individual control are important to health (Wilkinson & Marmot, 1998). Thus, further research in the areas of self-management, behavioural modification strategies, and factors relating to the social, physical, economic, and cultural environments of obesity and physical inactivity need to be considered with type 2 diabetes prevention programs.

### *Social Gradient of Health*

Poor social and economic circumstances have been shown to relate to health throughout life. Thus, there is a consistent social patterning of a gradient of health whereby people further down the social hierarchy have at least twice the risk of serious illness and premature death of those near the top (Wilkinson & Marmot, 1998). This social gradient in health reflects “material disadvantage and the effects of insecurity, anxiety and lack of social integration” (p.8). Kumari, Head, and Marmot (2004) state that an inverse relationship exists between social position and incidence of diabetes. Their study found that people working in lower employment positions had a higher incidence of diabetes than those in higher positions. Additionally, effort-reward

imbalance (e.g. work overcommitment) as well as material problems were associated with type 2 diabetes. Some of the factors contributing to the social gradient of ill health include: social and psychological circumstances causing long-term stress, social exclusion, psychosocial environment at work, job security and unemployment, and food supply and diet quality.

Individuals suffering from material deprivation have greater exposure to negative events (e.g. lack of quality food) and less exposure to positive events (e.g. education, resources, opportunities for recreation) (Raphael et al., 2003). In addition, health is influenced by material factors and relative deprivation (i.e. perceptions of income inequality) (Cattell, 2001) and psychosocial aspects of socioeconomic factors (Pikhart, Bobak, Rose, & Marmot, 2003). Although beyond the scope of this research study, to specifically address such issues scholars in social epidemiology hold little hope for diminishing the epidemic of chronic diseases, such as type 2 diabetes, unless interventions and policies directly address the social gradient of health (Raphael et al., 2003).

#### *Adherence to Diabetes Prevention and Exercise Programs*

There is a lack of published research on adherence to type 2 diabetes prevention programs. However, a study by Andersson, Bjaras, and Ostenson (2002) on the Stockholm Diabetes Prevention Program may help with understanding program adherence. This program has three stages: a baseline and etiological study, an intervention program (initiated in 1995), and a follow up study (data collected after ten years). These long-term outcomes of lifestyle changes may provide information regarding adherence to diabetes prevention programs. The lack of research in this area led to an examination of the evidence concerning exercise, a prevention program component, and to relate findings from a wellness program to diabetes prevention programs.

Exercise adherence addresses the means of staying with, or dropping out of an exercise program (Biddle & Mutrie, 2001). Researchers have broadened the construct to refer to the study of participation in exercise from a multidisciplinary approach, which goes beyond a psychological approach to motivation and considers the physiological effects of exercise. The topics of exercise adherence or exercise behavioural change, comparing adherers and dropouts, and factors affecting adherence such as self-motivation, personality differences and exercise commitment have been examined (Biddle & Mutrie, 2001; Plotnikoff, Brez, & Hotz, 2000). However, there is a need for exercise adherence to be considered from a larger, environmental perspective. For increases in physical activity and long-term behaviour change, not only should interventions involve individual-level variables but they should also address larger social and community dynamics and influences through changes to the physical environment (Salmon et al., 2003).

Erickson and Wilson (2000) examined why women discontinued participation in an exercise and wellness program and found that program participation was inhibited by family responsibilities, time constraints and lack of support. Although not generalizable due to the select population sample, similar research could be done with diabetes prevention programs to determine whether or not similar factors are salient to adherence decisions.

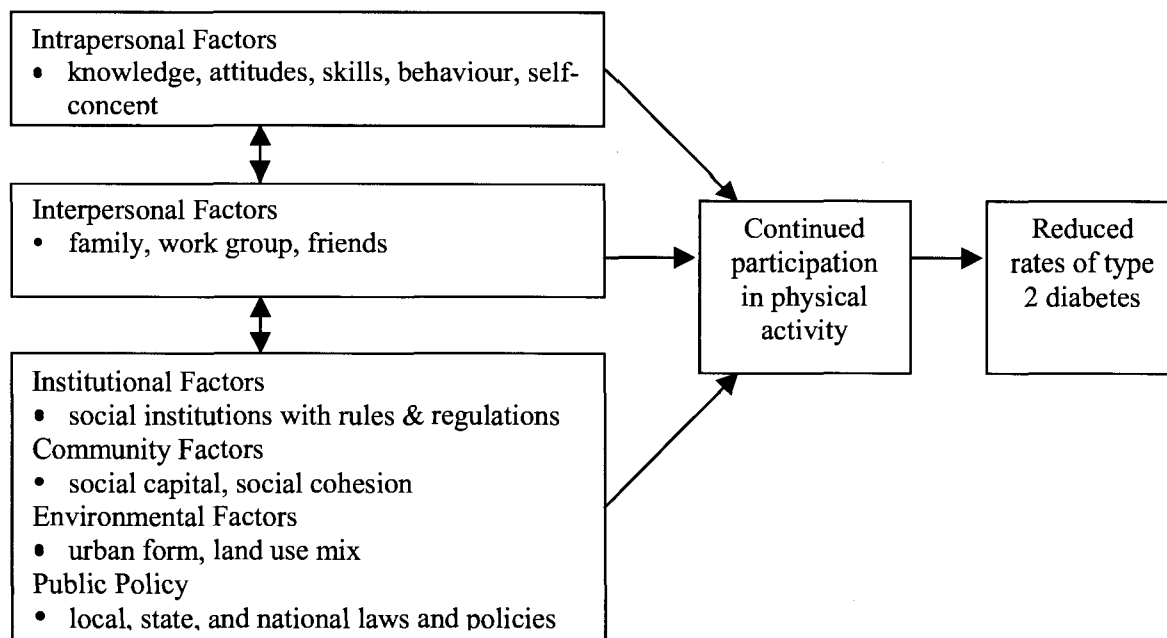
Health perceptions and behaviours were compared between wellness program participants and non-participants and it was found that participants had improved health behaviours and more positive lifestyle behaviours and perceptions of future health (Peterson, 1996). This study considered health behaviour models. It is speculated that similar programs could be tailored to diabetes prevention and studied with respect to program adherence and

continuation in physical activity to determine whether or not prevention programs have health behaviour outcomes similar to those of the wellness program.

Shultz, Sprague, Branen, and Lambeth (2001) acknowledge research indicating that diet and exercise are fundamental to the treatment (and prevention) of type 2 diabetes. Their research revealed prominent barriers to following a diet or exercise plan for people with type 2 diabetes such as difficulty maintaining a diet away from home, not liking foods not on a meal plan, lack of exercise priority, and weather dependency. Further research to examine these factors and overcome barriers from an environmental perspective is recommended.

### *Ecological Model*

The ecological model focuses on individual, social and environmental factors, which influence health promotion interventions and behaviour (Brownson, Baker, Houseman, Brennan, & Bacak, 2001; McLeroy, Bibeau, Steckler, & Glanz, 1988) and which influence individuals of populations that are at-risk for type 2 diabetes in terms of sustaining an active lifestyle.



*Figure 1.* Ecological model relating to physical activity and the reduction of type 2 diabetes adapted from Baker et al. (2000) and McLeroy et al. (1988).

As shown in Figure 1, there are multiple levels of influence on behaviour that include: personal factors (i.e., characteristics, knowledge, skills), interpersonal factors (i.e., social support/influences, the quality and nature of human interactions, peers, family), and community factors (i.e., environmental/structural factors such as health policy, community's ability to create health promoting change) (Baker et al., 2000).

The ecological framework outlined by McLeroy et al. (1988) categorizes factors influencing behaviour as follows (p. 355):

1. intrapersonal factors – characteristics of the individual such as knowledge, attitudes, behaviour, self-concept, skills etc. and the developmental history and health status of the individual
2. interpersonal processes and primary groups – formal and informal social network and social support systems (family, work group, friends)

3. institutional factors – social institutions with organizational characteristics and formal and informal rules and regulations for operation
4. community factors – relationships among organizations, institutions and informal networks within defined boundaries (social capital, social cohesion)
5. public policy – local, state, and national laws and policies
6. in addition, the built environment has been added to this framework as there is evolving and convincing evidence suggesting urban form and land use mix are salient factors influencing physical activity (for further information refer to the built environment section later in this chapter)

Ecological models explain how “environments affect behaviour and how environments and behaviour affect each other” (Sallis & Owen, 1997, p. 404). This is supported by McLeroy et al. (1998) who state that the purpose of ecological models is to examine environmental causes of behaviour and identify environmental interventions. The assumptions of ecological models include that behaviours are influenced by intrapersonal, social and cultural and physical environmental variables. Multiple levels of variables are relevant to understanding and changing behaviours and these variables interact (McLeroy et al., 1988; Sallis & Owen, 1997). Another assumption of the model is that behaviour is viewed as being affected by, and affecting the social environment. An underlying theme is the importance and effectiveness of addressing problems on multiple levels. Therefore, interventions simultaneously influencing multiple levels and multiple settings may be expected to lead to greater and longer lasting changes and maintenance of existing health promoting habits. Ecological models of behaviour focusing on environmental factors and the individual are important in increasing health promoting behaviours, including application in physical activity interventions (Baker et al., 2000). Overall, the goal of the

ecological model is to create a healthy community environment that provides health promoting information and social support to enable people to live healthier lives (Stokols, Allen, & Bellingham, 1996).

*Levels of evidence for factors influencing physical activity.*

The levels of evidence for the three main factors within the ecological model (i.e. individual, social and environmental factors) have been examined by Giles-Corti and colleagues (2002b, 2003) who found that relative influences of these factors were found to be almost equally important on physical activity. More specifically, for individual variables they found that the odds of achieving recommended levels of walking were 48% higher among those with high levels of perceived behavioral control and the odds were nearly twice as high for those highly intent on being active within the next two weeks. Regarding social factors, walking increased with the number of significant others who had exercised weekly with the participant during the previous three months (i.e. having others to exercise with, including a dog, was significantly influential). Examination of environmental factors influencing walking revealed that access to public spaces, particularly spatial access to recreational facilities (2002b). More specifically, in examining the relative influence of individual, social environmental and physical environmental determinants of physical activity (adjusted for other determinants), these researchers (2003) found that exercising was more strongly associated with individual determinants. Logistical regression odds ratios for individual determinants showed the highest determinant scores of 8.14, social determinants scores of 3.72, and environmental determinants scores of 1.43. Overall, they report that their study findings suggest that exercise is enhanced for people with positive individual factors and positive social environments that are conducive to exercising. A

supportive physical environment showed a significant, but a more moderate, influence on activity (2003).

Eyler et al. (2003) in studying diverse groups of women (e.g. white, African American, Latina, Native American, of various income levels, and living in rural, suburban, and urban environments) found that most consistent personal correlates associated with physical activity included (younger) age, good health, college education, higher income, and the strongest personal correlate associated with physical activity was high exercise self-efficacy (i.e. confidence in one's ability to exercise). Social environmental factors significantly associated across groups included knowing people who exercise and attending religious services. The significant physical environmental factor consistent to all groups was safety from crime. However, they acknowledge the limitations of their methodology as a possible influence on their findings relating to social and environmental factors.

A lack of consistency in the design, analysis and reporting of physical activity interventions resulting in ambiguous results has been noted by Seefeldt, Malina, and Clark (2002). Further understanding the levels of influence (individual, family, and community) and the implementation of a comprehensive strategy incorporating the multiple levels of influence, such as influencing individuals and creating supportive social and physical environment, are a requisite to the promotion of physical activity (Giles-Corti & Donovan, 2003; Seefeldt et al., 2002). As Eyler and colleagues (2003) state, "no single intervention fits all" (p. 103) and they found that no one factor was consistently associated with physical activity level among various population groups. They also suggest addressing all levels of influence (i.e. personal, social, and environmental and policy factors) to increase physical activity.

*Factors influencing behaviour.*

Intrapersonal interventions have a downstream focus and can include educational programs, mass media, support groups, organizational incentives or peer counseling where change is targeted at individual characteristics such as knowledge, skills, attitudes or intentions to comply with behavioural norms (McLeroy et al., 1988). Within the personal level of physical activity, motives are influenced by past experience with physical activity, physical condition, desire to improve physical fitness and appearance through physical activity, positive beliefs concerning the value of physical activity, fewer perceived barriers to being active and exercise-related self-efficacy (King, 2001).

The study of interpersonal level variables assumes that individuals are socially embedded, responding to and affecting their interpersonal environments (Lewis, 1997), thus relationships with family, friends, work colleagues and acquaintances are sources of influence on health related behaviours (McLeroy et al., 1988). Individuals are partly defined in terms of their interpersonal relationships and this creates confidence and self-efficacy for exercise and health matters. Social support and social networks are important in creating health-enhancing interpersonal environments (Lewis, 1997) and the complexity of social environments must be recognized when approaching health issues (Lyons & Langille, 2000).

Numerous studies throughout the 1970's and 80's consistently revealed that a lack of social networks or ties predicted mortality for almost every cause of death and that "social network size or "connectedness" is inversely related to risk-related behaviors" (Berkman & Glass, 2000, p. 149), including physical inactivity. Social support for exercise is positively related with physical activity (Trieber et al., 1991). Social networks also influence "cognitive and

emotions states such as self-esteem, social competence and self efficacy, depression and affect” (Berkman & Glass, 2000, p. 149).

Social capital is a much debated concept in the literature (Cattell, 2001; Kawachi et al. , 2004; Newton, 1997; Szreter & Woolcock, 2004). It has been defined as features of “social organization such as networks, norms, social trust that facilitate coordination and cooperation for mutual benefit” (Putnam, 1995, p. 67). Social cohesion has been viewed as the “extent of connectedness and solidarity among groups in society” (Kawachi & Berkman, 2000, p. 175). Thus, a socially cohesive society is rich in social capital. Components of social capital include: 1) norms of reciprocity (mutual aid), 2) levels of interpersonal trust, and 3) civic engagement. The greater the density of associational membership in society, the more trusting its citizens. Examples of civic engagement include voting in an election, socializing with a neighbour, or belonging to voluntary association that involves regular interactions (social connectedness) (Putnam, 1995). Norms of reciprocity (a component of social capital) are dependent on social networks, of which there are two main types: bonding networks that reflect connection, trust and (in-group) reciprocity among people who are similar (family, friends, co-workers, neighbours) and bridging networks that connects individuals to community organizations and resources and (generalized) reciprocity (Putnam, 2000); trusting relationships between people from different demographic groups but are of equal status and power (Szreter & Woolcock, 2004). A third type of capital has also been stated: linking social capital, which is norms of respect and networks of trusting relationships between people interacting across vertical power or authority gradients; it is particularly applicable to accessing public and private services that can only be delivered thorough face-to face interaction (Szreter & Woolcock, 2004).

An example of a contextual effect of social capital is features of the social or physical environment which influence the health of those in that environment (Macintyre & Ellaway, 2000). It has been suggested in the literature that social capital may have a contextual effect on health through three pathways: 1) influencing health related behaviours, 2) influencing access to services and amenities, and 3) affecting psychosocial processes (Kawachi & Berkman, 2000). These three pathways are applied to study findings in Chapter 5.

Social capital influences health behaviours by promoting the dissemination of health information (particularly in communities that are cohesive and in which members know and trust each other), influencing access to services and amenities (e.g. transportation, recreation facilities) and affecting psychosocial processes (e.g. providing affective support, self-esteem and mutual respect), and increasing the likelihood that norms of behaviour, such as physical activity, are adopted (Kawachi & Berkman, 2000). However, it should be noted that social capital may be a benefit as well as a cost (Glover, 2004a), such as encouraging health-promoting as well as health-damaging behaviours. For example, social capital can be optimized by facilitating collective action for mutual benefit and social good, or it can include coercive or corrupt aspects, such as providing resources for criminal gang members (Kawachi & Berkman, 2000).

Environmental level variables associated with levels of physical activity include but are not limited to, number of convenient exercise facilities and satisfaction with community recreation facilities (Leslie et al., 1999). Environments that have resources for physical activity such as sidewalks, parks, exercise classes and health/walking clubs and trails make it easy for people to be active (Nguyen, Gauvin, Martineau, & Grignon, 2002; Sallis et al., 1997) particularly populations with low rates of physical activity. A cross-sectional study of perceived environmental and policy determinants of physical activity revealed that neighbourhood

characteristics were positively associated with physical activity and a high level of support for health policy related measures. Environmental and policy determinants related to the physical environment should be taken into account in the design of interventions (Brownson et al., 2001) and incorporating environmental variables into health and physical activity research may inform advances in physical activity interventions (Saelens, Sallis, & Frank, 2003). Furthermore, research in the area of environmental determinants is needed because practical applications and interventions about the environment and physical activity are outpacing the evidence of what is important and what may be effective (Salmon et al., 2003). A recent and highly promising tangent of inquiry regarding environmental barriers explores the role of the built environment, urban form and land mix in affecting physical activity patterns will be discussed later in this chapter.

### *Human Behaviour Models*

Models and theories should be used in research and programs for studying human behaviour in order to plan effective evaluations and conduct more productive research (AbuSabha & Achterberg, 1997). A common perspective of individual behaviour change theories is that behaviour change is “a function of attitudes, perceived norms, and perception of one’s ability to initiate change” (Emmons, 2000, p. 251). Several dominant human behaviour models and theories are outlined in Table 1. This review is not meant to be exhaustive or inclusive but rather to highlight several influential individual behaviour change theories. Principles of these theories can be integrated into the intrapersonal and interpersonal levels of the ecological model, which is described later in this section.

Table 1.

*Human Behaviour Change Models and Theories Relating to Physical Activity.*

Model/Theory	Description
Stages of change model (Transtheoretical Model) [Prochaska & DiClemente]	People's readiness or attempt to change is a process; people go through five main stages as they acquire and maintain a new behaviour: precontemplation, contemplation, preparation, action, and maintenance (Prochaska, Redding, & Evers, 1997); different change processes occur at each stage (Glass, 2000).
Theories of reasoned action and planned behaviour [Fishbein & Ajzen]	Intention is the key determinant of behaviour, which is influenced by attitude toward the behaviour, subjective norm (social pressure), and perceived behavioural control (belief regarding how easy or difficult the behaviour is, as determined by internal factors – skills, abilities and external factors – time, opportunities) (Dzewaltowski, Noble, & Shaw, 1990).
Self-determination theory [Ryan & Deci]	Human motivations require the consideration of innate psychological needs for competence, autonomy, and relatedness (Deci & Ryan, 2000); focuses on the social-contextual conditions that facilitate and enhance rather than hinder self-motivation and optimal functioning.
Social learning theory [Bandura]	Behaviour is learned through observing and modeling other people's behaviours, attitudes, and emotional reactions; behaviours impacts cognition, which may influence future behaviours (Bandura, 1977); change the environment to encourage healthy behaviour; beliefs about behaviour and self confidence influence behaviour; sometimes need skill building; more likely to perform a healthy behaviour when rewarded (The Health Communication Unit, 2003).
Social cognitive theory [Bandura]	Behaviour is determined by triadic reciprocal causation, (i.e. three way interplay) between cognitive and personal factors (knowledge, skills, expectations), behavioural influences (self-efficacy), and physical and social environmental influences (Bandura, 1986; Davidson & Bandura, 2003; Nutbeam & Harris, 1999).
Health belief model [Hochbaum, Kegels, & Rosenstock]	Developed to explain and predict preventive health behaviour; health behavior is influenced by the interaction between beliefs or perceptions: perceived susceptibility and seriousness of a problem and perceived benefits and barriers of a taking action (Nutbeam & Harris, 1999).

The stages of change model is a model of intentional behaviour change, originally designed for people who smoke and since applied to other health behaviours such as physical activity. This model assumes that behaviour change is a process, whereby people have various

levels of motivation or readiness to change. Stages of physical activity behaviour and level of physical activity are related whereby physical activity behaviour progresses from stages of precontemplation to maintenance (Marcus & Simkin, 1993). In the pre-contemplation stage the person is not usually aware of the problem or need for activity and has not thought about a change. During the contemplation stage the person realizes she/he has a problem or needs to do activity and the person makes a plan to change his/her behaviour during the preparation stage. The person takes steps to change (e.g. adopt regular physical activity) during the action stage and during the maintenance stage she/he has changed behaviour and maintained it for six months or more (Halpern, Bates, Beales, & Heathfield, 2004).

The theory of reasoned action (TRA) (Fishbein & Ajzen, 1975) formulated that peoples' behaviour is influenced by taking into account available information and considering the potential implication of their behaviour. Thus, the theory is used to predict and explain voluntary behaviour from one's intention to actually perform the behaviour, based on the immediate behavioural determinant being an individual's behavioural intention (Wankel, 1997). Intention is determined by an individual's attitudes or beliefs toward the behaviour as determined by the belief that a desired outcome will occur if a behaviour is followed, and his/her subjective norm or social pressure (Dishman, 1988), such as his/her beliefs about and motivation to comply with what other people think should be done.

The theory of planned behaviour (TPB) is an extension of the TRA and acknowledges that not all behaviour is under volitional control as it is subject to external factors (Wankel, 1997). The TPB adds a perceived behavioural control component to behavioural intention, thus including the perceived ease or difficulty of performing a behaviour in explaining behaviour (Ajzen, 1985). Hagger, Chatzisarantis, and Biddle (2002) performed a meta-analytic review of

studies using TRA and TPB and noted that past behaviour weakened relationships between TPB constructs, however it did not completely remove the effects of attitudes on intentions, intentions on behaviour or of perceived behavioural control on behaviour. Thus, they concluded that people's attitudes and to a lesser extent, current cognitions (i.e. control and self-efficacy) are key influences and the most important predictors in informing intentions to participate in physical activity.

The self-determination theory (SDT) explains human motivations as requiring the consideration of innate psychological needs for competence, autonomy, and relatedness (i.e. social coherence or connectedness with others) (Deci & Ryan, 2000). Different psychological processes that underlie goal pursuits (e.g. intrinsic motivation) and social conditions of support for experiencing competence, relatedness and autonomy are differentially associated with effective functioning and well-being. Social contexts and individual differences facilitate behaviour collectively and influence need satisfaction, thus impacting experiences, performance and wellness (i.e. healthy behaviours and mental health). People can be proactive and engaged or passive and alienated, largely due to social conditions (Ryan & Deci, 2000). The SDT focuses on the social-contextual conditions that facilitate and enhance rather than hinder self-motivation and optimal functioning. When three innate psychological needs, competence, autonomy, and relatedness are satisfied enhanced self-motivation and mental health result and when limited, lead to diminished motivation and well-being. These psychological needs and processes within the health care domain must be considered, whereby knowledge concerning the factors essential for positive motivation and experience, thus for enhanced performance and well-being has relevance and broad significance. Motivation is the critical variable in producing maintained change. Thus, awareness of the presence or deprivation of supports for basic psychological needs

enables: diagnosis of sources of alienation versus engagement, support for individual assimilation within his/her social group, and facilitates enhanced human achievements and well-being (Ryan & Deci, 2000).

Social learning theory suggests that human behaviour is learned through observing and modeling other people's behaviours, attitudes, and emotional reactions. Behaviours also impact cognition, which may further influence future behaviours (Bandura, 1977). Building upon this theory, Bandura developed the Social Cognitive Theory for explaining behaviours (Wankel, 1997) whereby behaviour, personal factors (e.g. cognition and affect) and environmental influences are interactively related, referred to as triadic reciprocity, the mutual action between the causal factors (Bandura, 1986). Knowledge, beliefs and values influence how people behave and behaviour elicits social reactions which can alter behaviour. The environment (including social interactions) can alter personal characteristics, and age, gender, race and social status can evoke reactions in others when the behaviour is the same. Learning also occurs through social modeling, social persuasion, and observation, as well as through attention, translation (symbolic representation), incentives, forethought, self-regulation, self-reflection, and motivation to put learning into practice. The 'social' portion of the theory's title acknowledges the social origins of much of human thought and behaviour and the term 'cognitive' acknowledges the causal contribution of thought process to motivation, affect and action (Bandura, 1986). The model's view that efficacy expectations are a more central predictor of behaviour than outcome expectations has been supported in exercise involvement research (Desharnais, Bouillon, & Godin, 1986; Dzewaltowski et al., 1990).

The health belief model was developed to explain and predict preventive health behaviour and health decision making (e.g. attending regular health check ups) which considers

susceptibility to illness and perceived barriers and benefits to taking preventative health action (Clark, 1996). The likelihood of a person demonstrating a particular health behavior is influenced by the interaction between four main beliefs or perceptions: perceived susceptibility and seriousness of a problem, which lead to an assessment of the perceived threat, and perceived benefits and barriers of a taking action, which contribute to outcome expectations (Nutbeam & Harris, 1999). These factors influence self-efficacy which is the perceived ability to take appropriate action another factor included in predicting behaviour change. The model acknowledges that other behaviour modifying factors maybe present, such as personal characteristics, social circumstances, and the impact of immediate cues (e.g. media). As well, social, economic, and environmental factors shape the barriers to taking action (e.g. cost of services, lack of accessible services, social pressures). However, the model is based on the theory that people will not change behaviour unless they believe illness will bring serious repercussions (Clark, 1996). Therefore, this model is most useful when used to understand why people participate in prevention efforts and is limited in its application to a wider context, such as considering “long-term, more complex, and socially determined behaviours” (Nutbeam & Harris, 1999, p. 21).

These human behaviour models are based on psychological constructs and theories and they focus on understanding behaviour change from the perspective of one or more levels of the multiple factors influencing health related behaviours (i.e. continued participation in physical activity). The different levels of factors are outlined in the ecological model (see Figure 1). As Bandura (2004) acknowledges, “the field of health has been plagued by a contentious dualism” (p. 159). Individual approaches argue that people have significant control over their lives and self-responsibility for their health, and structuralist approaches believe that health is the product

of “social, environmental, political, and economic conditions, over which individuals have little control” (p. 159). He states that health promotion needs both approaches.

### *Social Environments and Activity*

Social environmental variables, such as exercise surroundings, having family who encourage physical activity, having at least one friend to exercise with, and neighbourhood crime influence behaviour. In examining interpersonal factors influencing physical activity, social support from family and friends is a clearly established determinant for exercise (Brownson, Baker, Houseman, Brennan, & Bacak, 2001). The physical and social composition of the urban environment promotes isolation. Sedentary lifestyles associated with high rates of television viewing, computer use, crime concerns, little contact with neighbours and geographic isolation have created communities which are not active or interconnected (Srinivasan et al., 2003). Corti and colleagues (1996) found that the use of recreational physical activity facilities resulted from a complex relationship between personal and environmental factors, whereby preferences, perceived ability and age barriers, social circumstances and competing commitments also interacted with proximity to shops and accessibility of free facilities. Therefore, environmental factors alone do not explain patterns of facility use. Dubbert (2002) mentions a need to examine physical activity for health outcomes, as well as incorporate environmental factors and social marketing approaches and theories in research and interventions, to develop a better understanding of neighbourhood and social support for exercise and make environmental changes.

Positive social relations and strong social support from families, friends and communities contribute to better health (Wilkinson & Marmot, 1998; Health Canada, 1994). Social networks involving communication and mutual obligation enable one to solve problems, deal with

adversity, and maintain a sense of competency and control over life circumstances. Caring and respectful social relationships and those providing a sense of belonging bring satisfaction and well-being, and buffer against health problems (Health Canada, 1994). In contrast, social isolation and exclusion are associated with increased rates of premature mortality, reduced survival after major illness, and poor mental health (Berkman, 1995), and poverty can contribute to isolation and exclusion. Positive effects of social integration occur through forms of social support (e.g. basic support such as food or housing, emotional support and information dissemination and support in making lifestyle changes) (Kawachi, 1999). Social cohesion, which is the existence of mutual trust and respect in the community, also helps to protect health (e.g. linked to crime, death rates, rates of heart disease) (Wilkinson & Marmot, 1998).

*Behaviour settings.*

Behaviour settings are “social and physical situations in which behaviours take place” (environmental contexts) which influence behaviour by promoting or discouraging certain activities that have consequences for being active or sedentary (Owen et al., 2000, p. 155). Behaviour settings include places such as schools, roads, subways and homes. An example of behaviour settings and their functions on choices of physical activity or inactivity in the context of the community would be the availability of sports and retail facilities functioning for recreation or socializing in which one can choose to be physically active (e.g. walking or participating in sports). Or, one may choose to be sedentary, such as sitting, reading, or dining. In an occupational context, behaviour settings may be office-based, trade and industrial or service industries whereby behaviour choices could include physical activity by walking to a colleague’s office, using the stairs, having a walking meeting or lunch time walking group. The setting may encourage inactivity through e-mail, telephone, sitting or using the elevator.

### *The Role of the Built Environment in Enhancing Physical Activity*

Research and practice is developing in a new public health paradigm of health promoting community design based on beliefs that “forces within the built environment may deter or entirely prevent individuals from making choices that promote healthy behaviors, especially routine physical activity” (Killingsworth, 2003, p. 169). See Appendix A for findings of studies examining variables of the built environment and effects on physical activity.

The built environment is defined as human created or modified places (i.e. places in the physical environment built by people for people), such as schools, workplaces, homes, buildings, roads, parks, business and industrial areas (Northridge, Sclar, & Biswas, 2003; Srinivasan, O’Fallon, & Dearry, 2003). Approximately 80% of North Americans are urbanized, that is living in towns and cities, spending almost 90% of the time indoors (Hancock, 2002).

Different settings and environmental characteristics encourage or make it more difficult for people to be active (Owen et al., 2000; Sallis & Owen, 1997). Sallis, Bauman, and Pratt (1998) reviewed published evaluations of environmental and policy interventions to increase physical activity. They concluded that a range of environmental characteristics is associated with physical activity, which include having multiple nearby exercise facilities, activity equipment in or near the home, perception of environmental barriers to activity, and neighborhood characteristics. Numerous studies exist examining environmental variables associated with levels of physical activity, such as accessibility of exercise facilities, parks, walking trails, aesthetic qualities and character of the neighbourhood (Satariano & McAuley, 2003) (see Appendix A).

Urban form variables also influence activity levels (street networks and design) and land development patterns (density, mixed use and jobs-housing balance and site design) (Frank, Engelke, Schmid, & Killingsworth, 2000). Urban design refers to the design of a city and the

arrangement and appearance of the elements within it; it is concerned with the function and appeal of public spaces (Handy, Boarnet, Ewing, & Killingsworth, 2002). Design influences physical activity in that features of the built environment such as traffic safety, large distances between one's starting point and destination, and accessible transportation networks influence people's decisions to walk or bike. These decisions shaped by the environment are also linked with individual factors, such as perceptions of lack of time and/or motivation and poor health. Street design can encourage walking or biking if it is attractive, perceived as safe (e.g. includes crosswalks, street lights), and connected to other streets (Frank, Engelke, & Schmid, 2003). Street design also incorporates elements such as sidewalks, street width, bike lanes, and aesthetic qualities contribute to the attractiveness or appeal of a place (e.g. landscaping including trees for shade along a street; public amenities such as benches and lighting) (Handy et al., 2002).

Land use mix refers to the composition, organization or distribution of land uses within a geographical area or space, such as a building, neighbourhood or entire city (Frank et al., 2003). It is the degree to which land uses are mixed or have a combination of uses within areas of a region (Ewing, Schmid, Killingsworth, Zlot, & Raudenbush, 2003). Single use areas are used only for one specific purpose, such as residential subdivisions, office/commercial centers, or industrial operations. Mixed-use development describes how far one needs to travel (proximity) between multiple destinations, whereby complementary land uses might include residential, commercial, entertainment and recreational destinations over a small area so there is minimum travel distance between activities (Frank et al., 2003). Distance is a barrier to non-motorized travel, thus mixed-use areas at the local level may have the greatest impact on physical activity and are thought to encourage travel behaviours involving activity, such as walking and biking. Density is defined as a measure of urban form that provides information on how compactly built

a place is (Frank et al., 2003) and the amount of activity in an area (Handy et al., 2002). Higher density areas are built compactly with reduced distances between destinations, thus promoting walking and biking.

Utilitarian travel is for a practical purpose or transportation to a destination, such as a trip to the store or work. Moderately intense activity, such as walking or bicycling, that can be purposive and incorporated into daily habits is more likely to be adopted and maintained because it is part of a daily routine, as well as because few financial resources are required (Frank et al., 2003). The built environment shapes travel behaviours that occur in that environment and behaviour is grounded in cultural norms and attitudes towards travel. Moderate activities allow people to fit activity into their daily schedule and habits, and can be encouraged or built into the lives of people by changing the ways communities are designed (e.g. to encourage climbing stairs, walking to a transit stop, biking to work or stores) (Frank et al., 2003; Robert Wood Johnson, 2003b).

In terms of active commuting, during 2001, 41% of Canadian adults walked to or from work or school or to do errands and 13% commuted by bicycle (Cameron, Craig, Stephens, & Ready, 2002). Saelens and colleagues (2003) summarized research on environmental correlates of walking and cycling and concluded that residents from communities with higher densities and greater connectivity and land use mix report higher rates of walking/cycling for utilitarian purposes than those from low-density, poorly connected and single land use neighborhoods. Rodríguez and Joo (2003) suggest that local topography (e.g. sloping terrain) is significantly correlated with an individuals' tendency to bicycle for transportation and sidewalk availability is significantly associated with the tendency to walk to destinations.

*Different activities require different environmental attributes.*

Different environmental characteristics have been found to be associated with different types of activity (Humpel, Owen, Iverson, Leslie, & Bauman, 2004). Walking in the local neighbourhood is influenced by aesthetics, proximity to shops, and accessibility to free facilities (Corti, Donovan, & Holman, 1996) as well as urban design features including the availability of footpaths, traffic control measures, walking paths and local shops. Deterrents include a fear for personal safety, particularly at night, and fear of dogs (Corti et al., 1996). However, more specifically, weather and aesthetics are associated with walking for exercise, whereas safety and accessibility are associated with walking for pleasure. Park use is influenced by aesthetic features, the presence of amenities and park size. For utilitarian cycling or walking, shorter distances between destinations is preferable (Frank et al., 2003). Pedestrians require good sidewalks and crosswalks and bicyclists require dedicated bike paths or lanes. Pedestrian safety and comfort on sidewalks is enhanced by on-street parking because it acts as a buffer between the traffic and pedestrian, however bicyclists prefer not to ride beside parked cars due to the risk of a car door being opened in front of them (Frank et al., 2003).

*Socioeconomic status, activity and the built environment.*

Socioeconomic status constrains the range of available choices (Frank et al., 2003) for travel and activity within the built environment for people of low income. Yen and Kaplan (1998) found that physical activity levels were lower for people living in poverty areas, thus place of residence influences health behaviour. Deteriorated physical environments are linked to high crime rates (Srinivasan et al., 2003) and lack of neighbourhood safety discourages walking. Factors influencing physical activity include lighting, criminal activity and access to and lack of resources, such as parks, playgrounds, gyms, sports fields, recreation facilities. According to

Northridge et al. (2003) the current urban planning literature does not account for health determinants within and across social groups defined by characteristics such as gender, race, and social class.

### *Summary*

This review of literature has briefly summarized major factors in the health promotion movement and fundamental research related to type 2 diabetes prevention programs. It revealed the gaps in the literature relating to adherence to type 2 diabetes prevention programs and the need for further understanding and application of the connection between people and their environments in relation to promoting healthy behaviours. This review also introduced a rationale for the examination of physical activity using the framework of an ecological model and a qualitative inquiry process and examined findings from the literature that relate to each element of the model.

## Chapter 3

### Method

#### *Case Study Research Design*

The case study is the research design used in this project, as it is an empirical study that “investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used” (Yin, 1984, p. 23). Thus, the purpose is to gather comprehensive, in-depth information about each case of interest and qualitative data will be classified for context analysis to search for patterns and themes within and across cases (Patton, 1990). Data were collected through interviews and a community self portrait (i.e. group mapping activity). By using more than one data source the researcher built on the strengths of each and minimized the weaknesses of any single data collection technique.

A case study is a preferred strategy when a “how” research question is being asked, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within a real-life context (Yin, 1984) (e.g. sustaining physical activity practices). Also, “what” questions may be exploratory, thus the utilization of a case study is appropriate. The aim in this qualitative inquiry was to understand factors influencing participation (or not) in physical activity for people of low income based on their personal experiences with a healthy living program. It was also to understand and explain the relationships between these factors, how activity can be encouraged or supported, and to inform readers about the participants’ experiences of activity following a SPDPP program.

### *Orientational Qualitative Inquiry*

An orientational qualitative inquiry was methodological approach followed and it was framed by the ecological model. The framework of this model determined what variables and concepts were most important (e.g. identifying intrapersonal, interpersonal, and environmental factors and the relationship between these factors) and how findings would be interpreted and given meaning (Patton, 1990). The purpose of this type of qualitative inquiry was to describe and explain specific displays of already presumed patterns. An orientational inquiry aims at confirming and explaining rather than discovering new concepts or patterns. Patton (1990) mentions that “orientational qualitative inquiry is a legitimate and important approach to theoretical or ideological elaboration, confirmation, and elucidation” (p.87). An orientational framework was followed however, integral to qualitative research is the understanding that these plans and preparation would be influenced by the findings revealed in the data. For example, a discussion question was added to the mapping activity incorporating information from the initial interviews in order to reveal further information around factors influencing activity and the connections between these factors.

### *Ecological model.*

The theoretical framework used for this study is an ecological model of physical activity (see Chapter 2). This model was used to examine which factors at various levels of influence were most important/prominent for individuals in terms of sustaining an active lifestyle.

### *Participants*

The research participants for this study were six adults who were living with low incomes, a population considered to be at-risk for type 2 diabetes (Raphael et al., 2003) and one adult who was not considered of low income but had participated in a program tailored to this

population (N=7). For further information about the participants, see Table 2 in Chapter 4. Participants were selected based on their completion of 'A Taste of Healthy Living', a healthy living program with the Saanich Peninsula Diabetes Prevention Project (SPDPP). The SPDPP is a federally funded participatory action research project which aims to understand how recreation influences the prevention of type 2 diabetes (see Appendix B). The healthy living programs lasted four to eight weeks in duration and were designed to introduce participants to physical activities, healthy eating, and foster social inclusion (see Appendix C). Therefore, it was of interest to select participants who had completed a program to further understand factors that influence continuation (or not) in activity following the program. For further information on the SPDPP please refer to [www.healthypeninsula.ca](http://www.healthypeninsula.ca). For an explanation and examples of how the SPDPP relates to community based participatory research see Table 4 in Appendix D.

Participants were recruited by a third party, since the researcher was also the SPDPP coordinator, and though she had minimal direct contact with participants this could be considered a "power over" position of coordinator/program participant. Program participants were introduced to the study by a program facilitator who explained the purpose and scope of the study. Interested participants were given a letter of invitation to provide further details and contact information for the researcher (see Appendix E). Approval was also granted by Peninsula Community Services to be the initial contact for potential participants, however this was not required. Follow up calls were conducted by the researcher to further explain the purpose of the study, voluntary participation, confidentiality and anonymity of involvement and confirm interview times. Participants were remunerated for their involvement in the project with an honorarium and transportation costs were covered while participating in the study.

This study involved three female and four male participants who had previously completed at least one SPDPP program. According to Patton (1990) there are no rules for sample size in qualitative inquiry. Sample size depends on what the researcher wants to know, the purpose of inquiry, what will be useful and have credibility, and what can be done with the available time and resources. The number of participants is also influenced by the quality of participants' experiences and their ability to reflect on and report their experiences (Morse & Richards, 2002). Additional descriptions of the participants can be found in Chapter 4.

#### *Sample Selection*

Purposeful sampling, specifically intensity sampling (Patton, 1990) was the strategy used for selecting research participants in order to collect information on factors influencing continued participation in physical activity, guided by the ecological framework. Purposive sampling allows for the selection of information-rich cases whose in depth study will clarify, explain and inform the research questions. For example, one may learn a great deal more by focusing in depth on understanding the needs, interests and incentives of a small number of carefully selected lower-socioeconomic groups than by gathering standardized information from a large, statistically representative sample of the larger population. Therefore, this study examined only a few cases, and those which strongly reflect perspectives of people of a low income population regarding factors influencing physical activity (i.e. it did not examine extreme cases). This study sampled intense "excellent or rich examples" (p. 171) of people from a population at risk for type 2 diabetes and documented variations in experiences and shared patterns to describe central themes of factors influencing continuing physical activity.

## *Interviews*

Audio taped semi-structured interviews were conducted for data collection and each participant was interviewed individually. Interviews allow the researcher to capture the perspectives of program participants (Patton, 1990) and for uniqueness in responses to emerge. Given that an orientational qualitative inquiry begins with an explicit theoretical perspective that determines what concepts are most important and how the findings will be interpreted, open-ended and theory driven questions relating to an ecological model were asked (see Appendix F). “Standardized open-ended interviews” (p. 280), were employed, enabling the researcher to ask each participant the same questions, therefore increasing comparability of responses. However, it is possible to combine interview structures and this study combined the interview guide approach and the standardized open-ended approach. It is possible to:

combine an interview guide approach with a standardized open-ended approach. Thus a number of basic questions may be worded precisely in a predetermined fashion, while permitting the interviewer more flexibility in probing and more decision-making flexibility in determining when it is appropriate to explore certain subjects in greater depth or even to undertake whole new areas of inquiry that were not originally included in the interview instrument (Patton, 1990, p. 287).

The interviews served as a follow-up to the participants’ involvement in an introductory healthy living recreation program to examine factors that influence their continuation or discontinuation in physical activity. Interviews were, on average, one hour in duration with the shortest duration of thirty five minutes and longest of two hours. It is helpful to use interview documentation sheets to document the context and situation of data collection (e.g., to note what may have influenced the interview) (Flick, 2002), therefore an interview documentation sheet

was maintained for each interview to capture details. The template was modified from a sample introduced by Flick (2002) (see Appendix G). For ease of accessibility to the participants the interviews took place at the Panorama Recreation Centre (SPDPP partner organization), a local coffee shop and one participant was interviewed at her home.

Immediately following each interview, field notes were recorded to document areas of uncertainty, which could be followed up with the participant; reflect on whether or not the interview revealed what was intended to be discovered and if not, what the problem was; document observations; and to establish a context for interpreting the interview. Reflective post-interview and group mapping notes were maintained to maximize the quality of the data (Patton, 1990) and to capture the researchers' reflections of her actions and observations in the field (Flick, 2002). Each interview and the group mapping activity were transcribed by the researcher. Participants were asked to review the interview and group map transcriptions to confirm that all information was accurate (that the interviewer captured the diversity of perspectives and grasped the contexts and viewpoints of the participants), so that additional comments or clarification could be made, and they could strike any information that they felt identified them, in order to maintain anonymity. This review is also referred to as a "member check" (Guba & Lincoln, 1989).

### *Community Self-Portrait*

Following the interviews, six of the seven participants were able to participate in a group activity to work individually (e.g. drawing) as well as together (e.g. group discussion) to create a community self-portrait (Marino, 1997), otherwise known as a 'community' asset map (Kretzmann & McKnight, 1993). Guidelines for assembling a community self-portrait/map were provided to participants (see Appendix H), based on the methodology outlined by Marino (1997)

and the theoretical framework used for the study (i.e. ecological model). This method was used to document factors that influence activity based on participants' involvement with the SPDPP healthy living program in the form of a map. Field notes were made by the researcher throughout the process and the activity was tape recorded and later transcribed to capture any unintended discussion. The community self-portrait exercise took place at the Panorama Recreation Centre (SPDPP partner organization). Figure 2 shows a picture of one section of the self-portrait/asset map. It reflects a discussion of perceptions of the community and physical activity experiences, and shows links between organizations and services and activity.

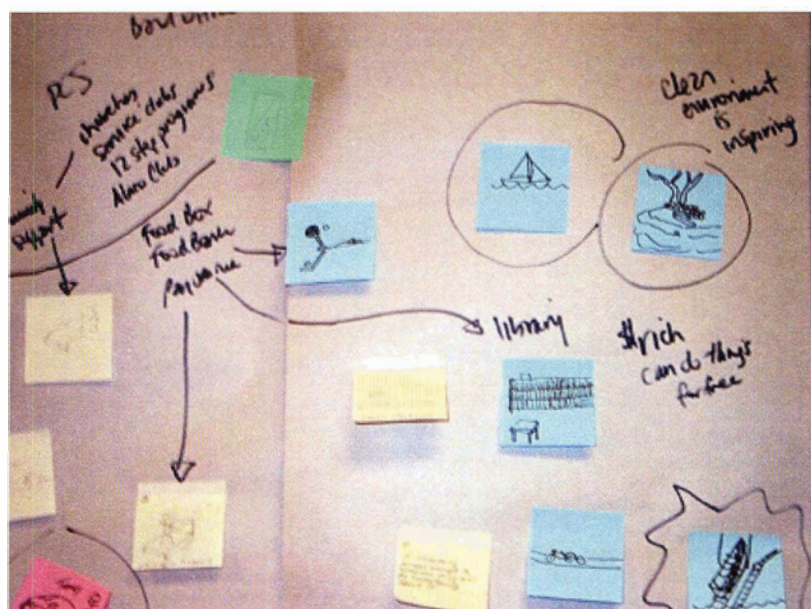


Figure 2. A picture of one section of the community self-portrait reflecting a discussion of perceptions of the community and experiences with physical activity.

Recipients of public assistance are often defined by their role as clients of institutional services rather than participants in a process, thus frequently becoming marginalized and isolated and their ability to contribute is ignored (Kretzmann & McKnight, 1993). Community asset mapping helps define the community, identify what strengths are available to help improve quality of life and match needs and assets. It is used to obtain a common view of what is

important, affirm or broaden perspectives and to hear and appreciate the values of others (Fuller, Guy, & Pletsch, 2002). A community asset (resource) is anything that can be used to improve the quality of community life, such as a person, physical structure or place and business (Berkowitz & Wadud, 2003). Asset mobilization can enable community members to gain control over their lives, thus meeting community needs and improving community life.

Community self-portraits can be used when goals relate to creating critical dialogue about specific issues through the interaction of images and works/reflections, to demystify research, especially information-gathering and issue identification processes and to encourage visual literacy (Marino, 1997). Preliminary interview findings (i.e. factors influencing physical activity) were integrated into the ecological model and provided a medium to prompt discussion and provide further clarification on the relationships between factors influencing activity. A content analysis of the map was done to examine patterns in adherence to physical activity and the levels of influence on activity and these data were related to the ecological model and concepts of social capital during data analysis.

“Interviews are a limited source of data because participants...can only report their perceptions of and perspectives on what has happened” (Patton, 1990, p. 245). These perceptions and perspectives are “subject to distortion due to personal bias, anger, anxiety...and lack of awareness” (p. 245). Therefore, community mapping data provided a cross-check on what was reported in the interviews. Although records are often highly variable in quality, with detail in some components and nothing for others, document analysis provided a ‘behind-the-scenes’ look (Patton, 1990) at the SPDPP program and factors influencing physical activity.

### *Researcher as an Instrument*

The researcher is considered an instrument in the research process (Lincoln & Guba, 1985). She interacted with participants and offered interpretation and understanding to events under examination. The researcher was adaptable in the collection of information about multiple factors at multiple levels, able to take a holistic perspective, and simultaneously operate at propositions and tacit (implied) knowledge levels and integrate these two sources. She immediately responded to situations and probed as insights arose, summarized information and sought clarification and further understanding.

The researcher took reflective notes to document changing constructs and promote rigour, validity and quality of data (Patton, 1990). As outlined by Patton (1990), the researcher must be able to demonstrate credibility and provide personal and professional information that may affect data collection, analysis and interpretation for others to judge the inquiry process. Thomas and Nelson (2001) further note that researchers require experiential skills in data collection, analysis and interpretation. In this study, the researcher brought training through graduate courses in research methods and qualitative inquiry and undergraduate courses in verbal and nonverbal communication at the University of Victoria.. She gained practical qualitative research experience in the role of research project coordinator with the SPDPP, which increased her competence in conducting qualitative inquiry. Locke and colleagues (2000) state that “preparation for qualitative research is most effective when it takes the form of apprenticeship, with intensive field experiences and closely supervised opportunities to practice the analysis of actual data” (p. 115-116). The researcher’s personal connection with the programs and operations of the SPDPP allowed her to maintain close ties to the at-risk populations and the topic studied. She has a strong interest and belief in qualitative inquiry and the importance of

understanding and applying the ecological model to promote human well being. Her strong values for the importance of physical activity influenced initial interest in the issue for investigation and the desire for an enhanced understanding of factors that influence activity levels. The researcher's experiences, values and beliefs have influenced this investigation from determining the purposes of the study to making decisions regarding methodology and analysis and interpretation of data.

### *Ethical Concerns*

All participants were introduced to the purpose of the study, voluntary participation, confidentiality and anonymity of their involvement during recruitment and the initial interview and were reminded again during the group activity. This was outlined in writing in an informed consent form (see Appendix I) and participants were given the opportunity to ask questions about and discuss the study with the researcher and/or her supervisor. Upon agreement to participate, participants were required to sign this form and an unsigned copy was given to the participant. This form had prior approval from the University of Victoria Human Research Ethics Board (formerly known as the University of Victoria Human Research Ethics Committee). Although it was not anticipated that there would be harm by participating in this research, it could have been possible during the interviews that participants could have felt sad or distressed as they reflected upon their lives and efforts to integrate physical activity. If needed, participants would have been referred to physical activity counselors/professionals to help them address any emotional concerns related to active living. Partial anonymity was maintained by the omission of participants' names in all written and drawn material. Transcripts and written work contained code names only and access to the code-named data was limited to the researcher. The community map was a group activity where anonymity could not be guaranteed as participants

saw and heard what others contributed. Therefore, participants were asked not to repeat what others say, write or draw after the session was over. Confidentiality was addressed by ensuring that all notes, transcriptions, maps, electronic files and tape recordings would be kept in a locked filing cabinet for five years and then destroyed.

Participants could have withdrawn from the study at any time and without any consequences or any explanation. It was explained to participants that should they withdraw, they would be contacted to determine whether or not they approved of their existing records (i.e. interview, community map, and/or transcripts) being used in the analysis of data. If the participant did not approve or if the researcher would have been unable to contact the participant after three attempts (via telephone, e-mail, and/or mail), records would have been destroyed and the participant's interview information would not have been used in the data analysis. However, it would not have been possible to remove all of their data from the community map portion of the study.

### *Trustworthiness*

In judging the adequacy and quality of qualitative inquiry, Guba and Lincoln (1989) developed four trustworthiness criteria, which are also known as parallel criteria, since the trustworthiness criteria "parallel" the criteria that have been used to judge quantitative research. The term 'credibility' in qualitative research is similar to internal validity in quantitative research, 'transferability' parallels external validity, 'dependability' is similar to reliability and 'confirmability' is similar to objectivity. These terms and their applicability to this study are explained below.

*Credibility.*

Credibility was demonstrated by prolonged engagement in the field, that is the investment of sufficient time to understand and learn the 'culture', test for misinformation or distortions of the self or respondents (Lincoln & Guba, 1985). Although the researcher was not engaged in the population's lived reality, she had an understanding of the general culture and established trust and rapport to uncover constructions due to her twenty-one months in the role of SPDPP project coordinator. Also, member checks were conducted whereby all participants reviewed transcripts and interpretations to verify data. Thus, they were able to correct any errors of factor or interpretation and add any additional information. They were also able to confirm that the researcher 'got it right' and that the constructs were grounded in data and matched their realities. Peer debriefing occurred and involved discussing methodology, findings, interpretations and conclusions with disinterested peers, SPDPP colleagues and partners, the researcher's supervisor, and committee members. Finally, progressive subjectivity is another credibility criterion and it is the process of regularly monitoring the researcher's developing construction. Throughout the research study, the researcher recorded what she expected to find and her developing construction.

*Dependability.*

Dependability was demonstrated through paper dependability and an audit trail, which was maintained with electronic transcripts, analysis of transcripts and reflective notes so that data could be tracked to their sources and findings were rooted in the data. The dependability audit was done to explore and judge the quality and appropriateness of the inquiry process, to understand contexts leading to interpretations, and to judge decisions made. The audit is done to document the logic of the inquiry process and changes in methodology and shifts in

constructions, which are imperative to a successful inquiry, and these shifts and changes need to be tracked and publicly inspectable (Guba & Lincoln, 1989).

#### *Confirmability.*

The confirmability audit is a technique used for confirming that data and interpretations are rooted in contexts and participants and not “figments of the evaluator’s imagination” (Guba & Lincoln, 1989, p. 243). The confirmability audit should be carried out with the dependability audit. It allows data to be tracked to their sources, and confirms that findings (interpretations) are rooted in data and the inquiry process can be tracked. It is done so that others can explore the inquiry process, understand contexts and judge decisions made and the quality and appropriateness of the inquiry process (Guba & Lincoln, 1989). To maintain this audit all records were kept in duplicate at separate locations to avoid losing important information.

#### *Transferability.*

Transferability is demonstrated with a thick description of the study (Guba & Lincoln, 1989) so that descriptive data are presented and enables others to understand the results and draw their own interpretations based on who and what the study involved. A thick description is the provision of all working purposes and descriptions of the time, place and context in which the data were collected and conclusions found to be prominent. This information has been described, thus, the study provides as complete a data base as possible to facilitate transferability judgments to others who wish to apply the study to their own situations.

#### *Data Analysis*

As mentioned previously, an orientational inquiry was followed and framed by the ecological model. Interview transcripts and the community self-portrait (transcript) were initially coded by topic, guided by the research problem and questions and ecological model, in order to

sort and organize the data into manageable categories. Topic coding was used to identify all material on a topic “for later retrieval and description, categorization, or reflection” (Morse & Richards, 2002, p. 117). Transcripts were also thematically coded and analyzed as data was scanned for sections (words, phrases, paragraphs) in which participants described influences on physical activity. Similar to analysis and interpretation protocol followed by Burton, Turrell, and Oldenburg (2003), identified influences were “considered as having the potential to either limit or facilitate participation in physical activity” (p. 228) and were grouped into categories based on the similarity of their source (e.g. individual, social and environmental influences), based on the ecological model. Differences between and across interviews and participants were noted. Data analysis was facilitated with the use of NVivo software (Flick, 2002) and informed by the ecological model. NVivo software is designed to assist researchers in organizing and analyzing qualitative data by combining coding with linking, shaping and modeling. Numerous text searching techniques were used in data analysis and analytic strategies for making sense of the data with this software include open coding (identifying concepts that fit the data and creating “nodes” in NVivo), axial coding (focusing around a concept), text patterning, and memoing (documenting or clarifying ideas, questions, patterns, reflections).

Furthermore, memoing was used to help examine the data by recording questions, observations, reflections, so I could reflect on them later and aid in the data analysis process, and to create an audit trail to track the research process. Examples of the researcher’s reflections and ideas written in memos include “social situation (group) was motivating – others’ energy was incentive to do something” and “social connections (interpersonal factors) links to sharing community resources (environmental factors).” Open coding included selecting and highlighting key words, statements and phrases and raw data from the transcripts were coded on a line-by-line

basis. This involved reflecting on what concept was represented in the piece of text which was then labeled with a code capturing the concept (the 'code' can also be termed a 'node' or category for the coding with the NVivo software). For example, one participant stated "I got to know other people and other people's problems" and this was coded as "social connections" under interpersonal factors within the ecological model. Nodes were created based on interview and mapping questions which were based on categories from the ecological model. Documents were coded with further creation of new nodes and other nodes were deleted or merged. Thus, nodes were constantly compared and coded data were grouped and regrouped into different nodes (or categories). Themes were created based on commonly stated topics, and incorporated statements regarding factors influencing physical activity and the relationships between these factors. Each theme was supported by data. An editing analysis approach (Crabtree & Miller, 1992) was used so that as patterns and themes emerged across transcripts and relationships between factors become apparent, each was reviewed in order to link these connections (Gahan & Hannibal, 1999).

The data analysis considered cognitive processes (Morse, 1994; Wharf Higgins, 1998) that include having an in-depth understanding of the issue (by reviewing the literature, talking with healthy living program participants, and becoming familiar with transcripts and community portrait as the thematic analysis began) and synthesizing the data (merging data sources) to find common themes and continually categorizing the data (reviewing the data to omit that which is insignificant and examine only the common and significant themes). As well, theorizing began by identifying beliefs and values, and linking these with existing theory, which revealed etic (literature/researcher) and emic (research participant) differences. Theorizing also involved constructing alternative explanations for the data and testing these theories until the best

explanation evolved. For example, following initial open coding of the data, twelve themes were identified in the data relating to intrapersonal, interpersonal and environmental factors and physical activity and relationships between these factors. Upon further analysis and review, five themes were created within the framework of the ecological model and these data supported theoretical literature relating to social capital (i.e. health related behaviours, access to services, and psychosocial processes). According to Morse (1994), the best fit is one that provides a comprehensive, logically connected, and simple model linking what appear to be diverse and unrelated facts in a useful, practical way. For these data, the conceptualization of social capital offered by Kawachi and Berkman (2000) was found to be the best fit. Recontextualizing the data was done to make sense of the patterns and themes in the categories and the emergent theory (Morse, 1994). Thus, the data were reframed to established theory and practice in the physical activity literature and existing theory (e.g. ecological model, social capital) provide the context in which the usefulness and implications of the study's findings are discussed.

Multiple versions of coded data were maintained to provide documentation of the data interpretation process. As well, the researcher maintained a journal of her changing constructs, speculations about the data, her reflections about the inquiry process, and a timeline of events. Therefore, patterns that appear in the data to the researcher have been described based on the analysis and interpretation of the data collected and her perspective. This is one perspective of the data and this information is able to be used by others to judge according to their own perspectives.

## Chapter 4

### Results

#### *Findings*

The interviews and group mapping activity data reveal participants' definitions of physical activity, what doing activity feels like to them, and their levels of activity following the SPDPP program. This information, as well as participant descriptions contained in Table 2, are presented in order to provide the reader with a sense of participants' experiences of physical activity. Elements of the ecological model, identified by participants based on their experiences in a SPDPP program, that encourage continued participation in physical activity are outlined in Figure 3. Five themes were identified in the data related to the concept of social capital and the main dimensions of the ecological model (i.e. intrapersonal, interpersonal and environmental factors encouraging and inhibiting continued participation in physical activity). Each theme and its relation to the model and social capital, as well as a summary of the connections between identified factors influencing activity and social capital follow the description of participants. The last section of this chapter summarizes suggestions to encourage physical activity for people of low income, based on interview and group mapping data (see Table 3) Participants' names have been omitted to protect their anonymity.

#### *Description of Participants, Their Definitions of Physical Activity and Activity Levels Pre and Post SPDPP*

Participants' characteristics are outlined in Table 2. In order to gain an understanding of participants' perspectives of physical activity and factors influencing activity, they were asked during individual interviews how they define physical activity. Although definitions varied among participants (see Table 2), many definitions included components of the Health Canada

definition of physical activity that it is “all leisure and non-leisure body movement produced by the skeletal muscles and resulting in an increase in energy expenditure” (Health Canada, 2003c, lines 3-4). Many participants described their definition by explaining activities that they used to do and were currently doing and which activities are difficult to do. Although not prompted to do so, it was interesting to note that only few participants included levels of physical activity when defining activity. One participant mentioned,

“For me it’s important that I do it everyday. If I don’t I get all, you know I can’t move but for other people the weekly thing does it. When we were going to the gym we were going three times a week and doing very extensive exercises and there were times I couldn’t do it, all, but I was at least going...walking to the mailbox is a big thing for me... it’s about, oh I don’t know 100, 150 yards but for me that’s a big deal.” [interview #2]

Table 2.  
Participants' Characteristics and Definitions of Physical Activity

Interview #	Interview date	Interview duration & location	Current or previous profession	Date completed SPDPP	Gender	Age	Interests	Health issues	Definition of Physical Activity	Other
1	March 2, 2004	10am-12noon; participant's home	day care leader	Aug-Sept. 03	F	34	Jazzercise, nature walks, being in the country, reading, cooking, gardening, friendships	sleep medication, weight gain, asthma, back pain	"something that's strenuous activity or non-strenuous" Non-strenuous examples included "a walk with your dog", parking your car further away from the grocery store, going for "a walk for lunch." Strenuous examples included "weights or cardio." Physical activity "can be playing soccer with a kid or going run...basically anything...incorporated throughout the day, it can be stretching."	not of low income (participant makes ~\$12-15 thousand/yr and spouse makes ~\$60 thousand/yr)
2	March 2, 2004	1pm-2:30pm; Panorama Board Room	currently not working because on disability	Oct-Nov. 03	F	60	crochet, cooking, family, president of tenants' association	osteoarthritis, both shoulder and knees replaced, diabetes, overweight	"everyday activity, just walking around the house sometimes...in the exercise program you're using weights and using every part of your body, your arms, your legs." Exercise was explained as not having to be done with great effort "because some of these people are in their 80 and 90's so it's just keeping the blood flow going and the mind active"	
3	March 3, 2004	11am-12noon; Panorama	janitor/maintenance work	April-May 03; Oct-Nov.	M	50	traveling, camping, drag racing,	depression, chronic fatigue,	"Any kind of movement." Such as "put your remote away and get up and	



7	March 16, 2004	4pm-5pm; Panorama 'The Loft' Room	self- employed construction worker	group Aug-Sept. 03; attended 1 or 2 classes; Oct-Nov, 03; current support group	M	47	do much camping; used to do more biking and traveling	bipolar affective disorder	sailing, photography, hiking, camping, boating	activity on his own...everyday, nothing appreciative is going to come of that, of any great benefit...I wouldn't get enough physical activity achieved every day in just doing a normal course of events. It just wouldn't be that strenuous to have any results. I come here [rec centre] to get the results...there's varying grades of physical activity" "Physical activity is working hard and exercising for enjoyment, like bicycling, swimming, walking, hiking."	participant attended mapping activity before interview; all other participants attended interviews prior to mapping activity
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n/a = not applicable  
current support group = spring, 2004

*What Doing Activity Feels Like: “fun, pushing yourself, and painful”*

Three dominant ideas or sub-themes were revealed when participants were asked what doing physical activity felt like or meant to them. The first was that activity felt fun, participants tried to make it fun, activity felt good, was a real benefit, and it was a positive experience. The second dominant sub-theme was that activity involved pushing yourself and the third was that activity was a hard time and it was painful.

Supporting the first theme, one participant mentioned that activity is rewarding and another mentioned that when he’s “*comfortable with it...it’s a major success*” [interview #3]. Another participant noted that it made her “*feel better*” and that “*it’s energy. You put it out and it doesn’t leave you. In fact it seems to come back more*” [interview #5]. One participant viewed participating in activity as “*a real benefit*” where feeling the benefits and seeing results were “*encouraging*” and the “*incentive and reason*” for being active [interview #6]. To further describe the second theme, several participants viewed activity as a task requiring effort “*sometimes...you have to push yourself and prepare*” [interview #1] and another participant commented “*if you don’t keep going and if you don’t push yourself...you tend to sit in a corner and feel sorry for yourself*” [interview #2]. Finally, for others, physical activity was a “*hard time*” or “*extremely painful*” due to preexisting health conditions, such as arthritis or chronic fatigue.

*Activity Levels Prior to the Program: “kind of on and off”*

Participants were asked whether they were active prior to the SPDPP program and results were mixed. One participant commented, “*no, active as in exercises and that, no. Well, yes and no...because we were going to the gym but no because we quit going to the gym about the time we started here*” [interview #2]. She mentioned that gym memberships

for her and her husband totaled \$90 per month and were too expensive so “*that’s why we’re not participating.*” One participant explained, “*I rode my bike more before. As I got off the biking I, over a two to three year span put on twenty pounds*” [interview #6]. Another participant commented, “*Not as much. In fact I was extremely depressed*” [interview #3] and another mentioned that he was “*relatively*” active [interview #4].

Another participant described her regular aerobic activity and periodic strength training,

I was walking probably forty five minutes or even twenty minutes up to mailbox, walking in the city and, gosh, before that previously it was kind of on and off working in weight room with weights and treadmill and stair climber...the walking was pretty much every day but the other, weights it was just kind of periodically. [interview #1]

Another mentioned that she “*used to borrow dogs and then take them for walks*” [interview #5]. Finally, one participant explained that he likely over-exercised prior to the program,

I worked my way up to like walking anywhere from 12, 14 kilometers a day and riding up to 30 kilometers a day when I realized may be I was kinda overdoing it...I could ride 16 kilometers and in the evening I still wanted to go for a walk and that somewhat had to do with medications and their effect on me. [interview #6]

*Activity Levels Following the Program: “increased and more consistent”*

When participants were asked “how would you compare your physical activity level following the SPDPP program to your level before the program?” and “where are you at now with continuing activity”, there was consensus among the group that activity levels were higher or as one participant stated “*way up*” [interview #2] and that participation in activity was more consistent following involvement with the SPDPP.

One participant mentioned that her activity level prior to the program was “*kind of on and off working in weight room with weights and treadmill and stair climber...the walking was pretty much every day but the other, weights it was just kind of periodically.*” She noted that following the program, “*even at work if I take kids to the park and instead of standing there I play a game or ball.*” She also increased the increased intensity and frequency of her activity, noting that her activity was now “*more consistent and it’s steady and it is at a higher level...in terms of how much I push myself for cardio and go more times and plus, and then get out for walks as well*” [interview #1].

Another participant stated that his activity level after the program was up by 20% but this was mainly due to “*necessity*” in order to “*get places*” since prior to the program he was not working so activity was done “*for fun,*” therefore, continuing to be active after the program was for the purpose of transportation [interview #7]. Another commented that it was “*up by at least 50%*” and the program “*enhanced my mental attitude towards it [activity]*” [interview #3]. One participant’s comment about post-program activity was “*I’m doing more now than I did before....More walking anyways. I try to. Exercising...there’s an exercise program at the [residential housing] complex now once a week. We’re working with a bunch of weights*” [interview #4].

More than one participant mentioned that they were doing “*as much*” or “*the best*” that they could in relation to physical activity. One participant commented about his pre and post program levels stating, “*I was a lot more fit five years ago. I wasn’t overweight and I rode the bike everywhere. Now I think I’m going in the right direction back to that point*” [interview #6]. One participant, after recovering from pneumonia following the program, stated she would be getting active again. “*I’m just starting this past week to really use my*

*pedometer. My goal last week was six kilometers a day and now I'm modifying it to an average" [interview #5].*

### *Ecological Model Elements*

Participants identified elements of the ecological model (i.e. intrapersonal, interpersonal and community factors) based on their experiences in a SPDPP program. These elements encouraged continued participation in physical activity and are outlined in Figure 3.

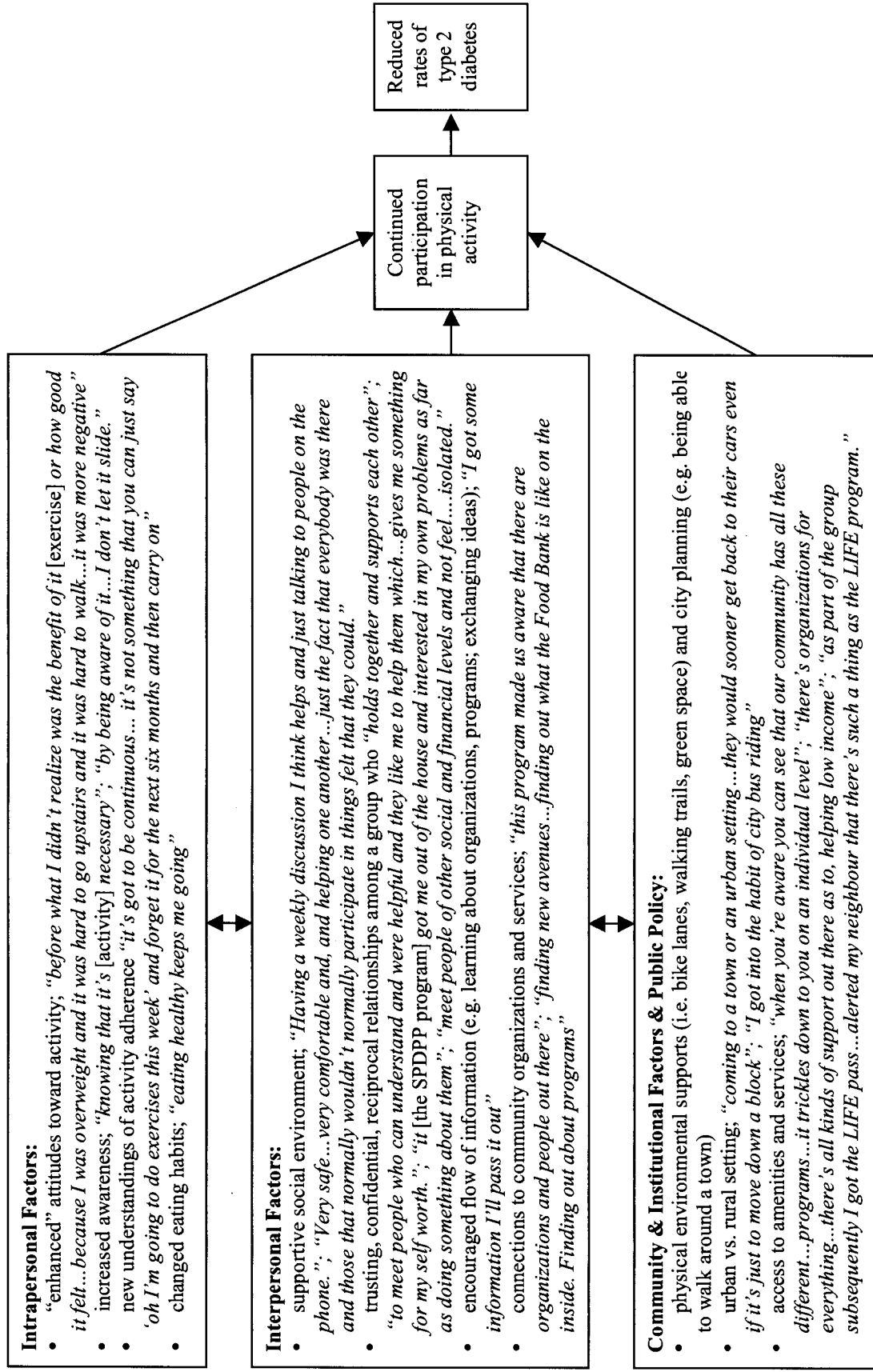


Figure 3. Elements of an ecological model reported by participants that contribute to continued participation in physical activity.

*Interpretive Themes Concerning Physical Activity*

*Intrapersonal factors.*

*Theme 1: Personal choices, attitude and healthy eating support participation in activity and health conditions can be barriers: "I'm more aware."*

The participants commented that following participation in a healthy living program their attitudes toward activity were "*enhanced*" and an increased awareness and knowledge of activity (i.e. "*knowing that it's necessary*") influenced and supported increased activity levels and continued participation in physical activity. One participant explained, "*I guess by being aware of it I'm just, I don't let it slide*" [interview #5].

Another participant mentioned that her mindset and attitude toward activity had changed,

Before what I didn't realize was the benefit of it or how good it felt or what a great job it was doing for my body...because I was overweight and it was hard to go upstairs and it was hard to walk, you know, it was more negative [however, due to] the feeling in my body when as it started getting healthier...I realized, hey I can get up this hill now a lot faster...I'm feeling a lot better...I started noticing the change, I had controlled asthma again, I was getting muscles, just the whole change. [interview #1]

Noting her increased level of activity and awareness toward activity following the program, one participant described her new understanding of activity adherence,

Physical activity has to be not just a one, one, a shot in the pan, it's got to be continuous, go on and on it's not something that you can just say 'oh I'm going to do

exercises this week' and forget it for the next six months and then carry on. [interview #2]

Time was mentioned as a constraint to doing activity. However participants mentioned that this was overcome by personal choices to do enjoyable activities and making activity a priority or commitment. Participants also noted the influence activity had on physical and mental health. *"It makes me feel better. I've always known this, that if I can put one foot in front of the other that eventually it'll help my depression"* (group mapping, female #1).

I've realized that I need to block out that time. I look forward to it... that was very important to us to set aside that money to be able to go to the centre [Panorama Recreation Centre]...I know it's [physical activity] being supported when I make that commitment and that promise and I go out there and I do it. [interview #1]

Physical activity was also encouraged and reinforced by the program's social network, interactions and connections, as well as psychosocial work environments, thus interpersonal factors encouraged and reinforced individual behaviour. These ideas are highlighted in the following quotes and further explained in themes three and four. *"Having a weekly discussion I think helps and just talking to people on the phone"* [interview #5].

I was closing up shop at work for six o'clock and I could not make it to jazzercise so I actually asked them for time off...to make sure that I'm home in time to eat and digest the food, get changed and get there...I just felt like they knew about me wanting to be active and they understood and could have made it a lot more difficult. [interview #1]

Self-image and perceptions by others were also identified by some participants as an individual barrier to activity. One participant commented *“I think that if you’re afraid of being too overweight for example you might not want to go where there is physical activity. I’m thinking swimming for example”* [group mapping, female #1]. Another participant mentioned that his friend *“who’s extremely obese...doesn’t even want to go to the gym ‘cause he figures he’s going to be looked at ‘look at the big fat slob’”* regardless of the fact that the participant had offered to go with him. For another, focusing on weight was *“too much of a mind game”* which led to self-blame and feeling miserable. For another *“not being as fit as I could be is disappointing.”*

One’s *“health situation”* was commonly identified as a factor influencing activity levels and contributing to feeling isolated in the community (i.e. reason for not participating in community programs). Fatigue, energy levels, and pain were common barriers to activity. Participants’ health conditions included mental illness (bipolar affective disorder), chronic fatigue, diabetes, depression, sleeping disorder, asthma, arthritis, overweight, joint replacements, back pain, and hepatitis C. When asked *“What makes doing physical activity challenging? Or what stops you from doing activity?”* one participant answered, *“getting into a real bad depression”* [interview #5]. Another participant mentioned that *“having a cold or flu”* kept her *“from being totally active”* and she explained, *“when you get sick and you’re going back to exercise you have to try not to get frustrated because your body went back to, I don’t know, you’re back at day one again”* [interview #1].

Numerous participants stated that a health behaviour, such as healthy eating supported activity. As noted by one participant, *“eating healthy keeps me going. If I’m fully snacked I will go out to the park, I will go out, I can do anything really”* [interview #1].

Another noted he had “*changed some of [his] eating habits*” [interview #3] which influenced continuation in physical activity. However, repeatedly eating healthy was perceived as difficult due to cost. One participant shared his opinion that “*the only thing not expensive out there is junk food so trying to eat healthy is extremely, extremely hard*” [interview #3] and another participant stated, “*I still have a very, very low budget of eating. And I really like to eat properly but, I have trouble eating properly*” [group mapping, male #4].

*Community and institutional factors, and interpersonal relationships.*

*Theme 2: Limitations of living with a low income, social problems and social stigma influence activity: “You’re actually almost caged without having a cage there. There are invisible bars.”*

Numerous participants mentioned that being at a material disadvantage and “*short on money*” limits or restricts what and how one can eat and what one can do, including attending activities and events in the community, and meeting and socializing with others. “*It puts a massive limitation on everything...it just, just limits you so much. You’re actually almost caged without having a cage there. There are invisible bars*” [interview #3]. One participant stated that not being able to do things with others due to a low income “*is actually the hardest part of not having money*” and identified not having money as a social disadvantage. “*I would say no rather than rather than saying I don’t have money for it because then I would feel the other person would feel compelled to offer...so there’s a social disadvantage there*” [interview #5]. Lack of money to pay for membership to a gym or purchase proper equipment was a mentioned as a barrier to doing activity. One participant explained, “*that’s why we’re not participating. \$45 a month which adds up to 90 for two people, just right now we can’t hack it, you know there’s other things are, I won’t say are more important but take*

*up the money*” [interview #2]. Another participant mentioned that he had “*a crummy bike where the seat is so worn out it makes [his] pants dirty*” [interview #7] and others mentioned that not having a bathing suit to go swimming precluded their involvement. Limited material resources also inhibited socializing with others and contributed to their sense of social exclusion. One participant mentioned that it was embarrassing not having a tv to watch what’s going on in the world.

Frequent comments were made identifying a social “*stigma*” that is associated with being a person on low income and an “*attitude*” or “*judgement that isn’t particularly flattering*” that is made by others. One participant explained, “*they [society] made you feel like you were low life...that’s a social thing and it’s sad that it’s out there, but there is that stigma*” [interview #2]. The existence of a social gradient and lack of social integration was explained by one participant as,

It’s how people look at you, their, their perception of how you’re feeling or why you’re feeling that way... and at one time I used to run and hide. Now I say walk a mile in my shoes...people judge until once explained, people get a different perspective. [group mapping, female #2]

In another account, one participant mentioned that a common reaction she receives when people learn she works at the Food Bank is that “*they look down on the, on the clients. They think that I shouldn’t be helping out these bums*” [interview #5]. One participant shared the following insight into the social gradient,

They [society] actually make an individual feel less than. It’s like you’re feeling that you’re a third party of nothing and instead of being in the centre of the hub of wheel where the action is and things are good and healthy you’re on the outside, actually,

basically the tread of the wheel where that's what's happening, is you're getting tread over top of. You know. I see people in the welfare lines that are just struggling like crazy and they're trying to follow their [welfare system] criteria. [interview #3]

Social connections, supports, and sharing experiences with others were suggested as ways of dealing with being "*categorized*" and overcoming "*misjudgments*." One participant explained, "*I think maybe that relates back to wide...social networks...that's why it's really important to have good people that you can talk to*" [group mapping, female #1].

I don't think anybody should be ashamed of or have to be ashamed to of being low income and I don't think that people should have to explain why. Like, the circumstances are nobody's business but ours. I don't mind sharing my experiences because it gives other people in the same position an insight as to how this comes about and I've got to admit that when we were making the bucks I didn't think about the people who weren't making the bucks. [interview #2]

As indicated by participants mentioning a lack of programs and social deprivation, 'low networks' make it difficult for some participants to obtain information and meet people associated with physical activities (Burton et al., 2003) and also with other social issues related to living with low income. As one participant explained,

We have rights you know but I think what would help a lot if we knew what our rights were and they weren't hidden to us. We have to guess what our rights are. I mean that's where Together Against Poverty [non-profit society providing legal information and assistance to low-income people in the Greater Victoria area] comes in but I mean somebody like myself I don't even know what questions to ask.

[interview #3]

Participants identified social problems that are “*part of our community*” as underlying factors influencing activity and the community. One participant further explained this issue, “*the addictions, drug addictions...these people who are living out on the streets...they may not live in a house. They may live under a bridge. They may have addictions to alcohol, drugs, sex trade, whatever*” [group mapping, male #1]. Questions were raised as to how to address these problems, such as “*How can we as a community like this help those people?*” [group mapping, male #1]. Another participant questioned, “*how I can help these people without giving them stuff? How can we help them get their self esteem up to where they’ll come back to the community, become a productive member of society?*” [group mapping, male #4]. The participants’ solutions were embedded in social relationships and “*community support*” through programs, organizations, service clubs, churches, homeless shelters, community outreach, and volunteering where people are “*helping their community but they’re helping themselves as well.*”

*Interpersonal factors.*

*Theme 3: Social connections and interacting with others support healthy choices and the establishment of norms of activity: “Opening up a different world to all these connections.”*

This theme focuses on interpersonal factors supporting and encouraging physical activity, including social support, family, pets, the reciprocal nature of helping others and volunteering, as noted by one participant, “*when you help other people it helps you to be happier and healthier*” [interview #5]. The above mentioned factors were all connected to social capital through psychosocial processes, such as having trusting, confidential and reciprocal relationships. There was consensus that interacting with others (social support and

inclusion) encouraged, motivated and supported physical activity and individual change. One participant commented, “*it gave me the shot I that needed to do something about the way things were going*” [interview #2].

Family members, friends, pets and fellow program participants were social influences acting as inspirations, incentives or motivators for being active or bettering oneself and they create group norms for activity. When asked “do your family and friends affect or influence your physical activity choices?” even the two participants who responded “*no*” later explained various ways that family or friends influenced activity, whether it was through a neighbour providing fitness passes, family and friends supporting or encouraging activity, or “*hiking for friendship.*”

Through being active and going to Panorama and having exercise it’s been very positive to help me meet people in the community and now I’m taking it one step further, in terms of meeting them for lunches, or going and seeing what they do on jobs, so it’s just opening up a different world to all these connections in all these different ways....they let you know their types of hobbies and invite you out for a hike and get to know where you live, get to know them socially. [interview #1]

When asked what the most enjoyable aspect of the SPDPP healthy living program there was consensus that it was the social aspects, such as the supportiveness of the group, the discussions, meeting new people, realizing “*you’re not alone*” and “*getting out there with people.*” One participant provided her story,

It [the SPDPP program] got me out of the house and interested in my own problems as far as doing something about them... and the diversity of people that were there

was fantastic, different problems...it makes you realize you're not the only one with particular problems. [interview #2]

Participants identified physical activity as encouraging social connections, however a perception of social status and inequality was evident, as one participant explained,

With me walkin' the dog I see people walking by the street everyday...there's people who are good enough to stop and talk to me, you know and that's the one thing I find with walking the dog, I mean I get to meet the people in the neighbourhood. [group mapping, male #1]

Getting to know fellow community members, participating in programs and sharing and utilizing resources leading to individual gains reflect norms of reciprocity and the expectations and obligations of mutual aid. As one participant explains "*right now where I park my motor home I have an agreement. I get to park it there for nothin' but I do his yard work and I love yard work*" [interview #3]. One participant spoke about the social connection she has at the local Food Bank which supports her regular attendance there, stating "*I don't know whether I could stand in the line in Victoria and then I started thinking ya I could but then I, I would be treated differently because they wouldn't know me and I don't want that*" [interview #5]. Through social connections one's network broadens, as noted, "*I'm getting to know the new neighbours because \_ [names his friend] knows them all and he's well established in our community so that's a bonus for me*" [group mapping, male #1]. One participant mentioned, "*with my communication skills that I've learned [in various community groups] I can interact with other people*" and "*I have a knowledge of what's out there*" (local programs and services) so he can talk to people "*about what is available*" [interview #3].

*Built environment.*

*Theme 4: Urban vs. rural setting, community design and organizations, availability of programs and services, weather and safety influence activity: "They would sooner get back to their cars."*

Access to amenities and services, spatial segregation (i.e. physical activity opportunities are influenced by where one lives), and community organizations providing programs and resources all influenced participation in continued physical activity. Activity was also influenced by regulations, convenience, rural landscapes (including fresh air) and weather. When asked what makes doing physical activity easy or helps participants to be active common environmental level answers included: physical environmental supports (i.e. bike lanes, walking trails, green space) and city planning (e.g. being able to walk around a town). Social environmental influences included social connections, social norms, perceived safety and trusting one's neighbour. As one participant explained, community size and social connections contribute to norms of reciprocity, "*I grew up on James Island which is a very...small community and everybody knew everybody else and, and if somebody needed a hand everybody else was there to give it*" [interview #2].

One participant explained how social settings and norms influence physical activity by providing an example of an urban setting,

Coming to a town or an urban setting I've come to realize that people have lost that you know it's, it's a chore for them to park their car and walk maybe three blocks, they would sooner get back to their cars even if it's just to move down a block [interview #5].

Another participant mentioned the convenience associated with decreased activity *“it’s easier to ride than to walk...and time is another one...it’s a lot quicker to go on four wheels than on two”* [interview #6].

Access to amenities and services, which influenced individual participation in physical activity, was influenced by increased awareness and the availability of programs and services. As one participant explained, *“when you’re aware you can see that our community has all these different types of beautiful programs and things and it trickles down to you on an individual level”* [interview #1]. Numerous participants mentioned the various organizations and services that are available to support people of low income. *“There’s all kinds of support out there as to helping low income. There’s the Food Bank....PCS and this place [Panorama] have been a huge help [influencing activity]...they are underused”* [interview #6]. One participant mentioned a difficulty accessing some facilities and activities due to *“restrictions, rules and regulations”* [interview #7].

Participants mentioned transportation was a barrier to *“trying to get to wherever the activity is going to be”* [interview #2] and the Handy Dart was *“limiting”* due to scheduling and taxis were *“not affordable”* and one participant mentioned that he didn’t think there was a problem with bus transportation and that it operated regularly, however he also mentioned that he didn’t use the bus system. *“I have a car but then the price of gas that’s unbelievable”* [interview #4]. One participant explained *“transportation is the biggest thing. If you can’t get from one place to another without it costing you money then you just don’t, you don’t go”* [interview #5]. However, she noted an increased social connection because she had to walk, *“if I walk along Landsend I know more people along Landsend than most people in their cars know. I know people all the way along there”* [group mapping, female #1].

There was a consensus that lack of safety inhibited activity, as one participant outlined, *“I would not be sending my kids on a hike in this day and age. I know when we were kids it didn’t matter where you went or when you went you were safe and now you’re not”* [interview #2]. Regarding *“nature trails”* and walks *“through the trees”*, the same participant mentioned that *“there’s so much danger lurking out there that I would be frightened to take a walk like that.”* Participants also mentioned that they didn’t feel safe in Victoria and they *“won’t walk downtown alone”* or at least in *“certain areas of town.”* Environmental supports also inhibited perceptions of safety and comfort, *“I wouldn’t feel comfortable at night on a road like this with no lights”* [interview #1]. However, a suggestion for overcoming safety concerns was also mentioned, *“there’s got to be safety in groups”* and this participant suggested creating accessible, safe programs to encourage activity for different populations such as *“kids, teens, young adults, old adults, people with physical disability...and subsidize it for the ones who need it”* [interview #2].

*Intrapersonal, interpersonal and environmental factors.*

*Theme 5: SPDPP program supports dimensions of social capital: “It’s priceless.”*

The SPDPP’s healthy living programs addressed intrapersonal, interpersonal and environmental factors influencing activity. The programs provided information as well as opportunities for information sharing, social support and resources (e.g. water bottle, pedometer, goal setting) which not only encouraged individual behaviour change (e.g. drinking more water, doing activity) but influenced others’ behaviors as well, further reinforcing the behaviour change. Together these factors built self-esteem and trusting relationships, and social connections were formed.

One participant mentioned that the SPDPP gave her “*some of that foundation*” to help her continue learning and doing activity, increased her knowledge and awareness of “*what healthiness is, healthy eating, healthy choices and having fun during physical activity*” which encouraged her to discover activities that she enjoyed and “*continue to do those*”, as well as seek out further information about type 2 diabetes because she “*wasn’t aware of what it was before*” so that she can “*try to avoid it*”, lose weight, have fun and “*make it a lifestyle*” [interview #1]. Information sharing was a positive aspect of the program, as one participant noted difficulties he and his wife had accessing information on their own through books and on the internet prior to the program,

We started looking things up [on diabetes] and a lot of times it scares you because you don’t understand what they’re talking about and they go too far in detail for the normal person...on the internet and in any of the books you read...it’s too detailed for the lay person I think. [interview #4]

One participant mentioned that the integrated approach of the program was effective in helping her

Get stronger...everywhere...nutrition and fitness are sort of two things separate but they’re not really and that’s why it was really good to work at it as one whole thing. And the feeling...good about [yourself]...the self-esteem that was the other thing...all of them just worked together. [interview #5]

Participants commented that the program was “*worth coming to*” and there wasn’t anything they didn’t enjoy about the program. However, one participant noted that regarding recreation/disease prevention programs he felt that some people “*say ‘it’s no use to me’*” and some SPDPP participants “*thought it [SPDPP program] was completely useless...that’s why*

*they don't come. They thought nothing was helpful to them*" [interview #5]. To provide a context for the drop out rate of participants, in one of the programs fifteen people expressed an interest in the program or were recommended to participate by a local agency and of this seven people attended regularly (53% drop out). However, of the seven regularly attending participants, four (57%) returned to another SPDPP program. Although for some people the program may not have been "*what [they] wanted*", for others, they were unable to attend due to other life circumstances (e.g. busy moving and other personal reasons, obtained employment, other commitments) and they expressed an interest in future programs.

Participants commented that pedometers reinforced and motivated continuation in activity and as one participant explained, it helped him build self-esteem which further motivated activity,

When I first got it I think I might have done 500 steps in a week and then it started to double each week and it showed me that I was progressing and that I was doing something. It built my self esteem and with self esteem going up of course the weather started getting nice. I got out. I got more active...the little self esteem that I was given by comin' to this program was worth a million dollars, it's, it's priceless. You know, it actually got me up doing things. [interview #3]

Overwhelmingly, participants noted trusting social connections and the by-products of these social relationships as the most memorable aspect of the program. One such by-product was information sharing "*if you don't have money and you don't know of any places to get inexpensive stuff you're stuck. So it was really good to tell people the things in community*" [interview #5]. To provide an example of the social environment of the program, one participant explained that she "*got to meet and know people but we* [program participants]

*maintain confidentiality so people are able to talk....it feels good like I trust them, they trust me. I think that's good. I think you need an element of trust in any relationship"* [interview

#5]. One participant explained her evolution from social isolation to social inclusion,

I used to hate the telephone. To such a point that I actually bought an answering machine...I had this fear or anxiety that when the phone rang it would be somebody wanting something that I couldn't give or didn't want....it's been good because it worked out for me like I don't have to be afraid of the telephone. I answer it now if I'm home...I would have never volunteered to phone people ever because I hated it so much but now I just phone people up and I encourage them to phone me...I gained something from that experience. I do it happily. [interview #5]

#### *Connections Between Factors Influencing Activity and Social Capital*

Participants viewed factors influencing continued participation in physical activity through the development and utilization of social capital. Intrapersonal factors such as affect, sense of well-being, attitude, seeing results from activity, as well as psychosocial processes including support, respect, trust and inclusion, contributed to participants' accessing programs, and involvement in organizations, all of which supported their participation in physical activity.

When asked in an interview about possible connections between the three categories of factors in the ecological model, one participant did not identify a connection. However, analysis of interview data revealed a relationship of influencing factors supporting his decision to continue to be active that is explained through community support and social capital. His initial response regarding low income and physical activity was that "*a lot of things are an impossibility to do. You can't uh you know go places, do anything really.*"

However, this participant's reflection of psychosocial processes (interpersonal factors) such as making social connections and developing social networks, were considered by the researcher to relate to his ability to access amenities and services (environmental factors).

*“Well I got to know other people and other people's problems. Gets ya out of the house...There's an exercise program at the [residential housing] complex now once a week. We're working with a bunch of weights...it just keeps you active.”* [interview #4]

#### *Suggestions to Encourage Physical Activity for People of Low Income*

The final interview questions were, “What can be done on the Saanich Peninsula to support or encourage physical activity for people of low income?” and “What advice would you give to professionals and policy makers on what can be changed in communities to encourage physical activity for people of low income?” The answers to these questions along with group mapping activity data revealed a dominant theme, ‘create supportive environments’ encompassing both social and physical environments. Data have been further organized into six sub-themes: 1) “programs, more programs” and parks, 2) physical and financial accessibility: “make it easily accessible”, 3) advertise and communicate: “get the word out there”, 4) work with schools 5) shift workplace culture, and 6) food accessibility and healthy choices. Each sub-theme is introduced in Table 3 and further discussed in relation to the literature in Chapter 6.

Table 3.

*Participants' Suggestions to Create Supportive Environments in order to Encourage Physical Activity for People of Low Income*

Sub-Theme	Explanation/Suggestions
"Programs, more programs" and parks	<ul style="list-style-type: none"> <li>• More busing, child minding, car pool options, bicycle and walking clubs; teaching people communication skills and social skills, offer a physical activity and lifestyle expo.; have a diversity of programs for different ages; create opportunities for activity and socializing, <i>"a weekly thing...so it's continuous...it's affordable, entertaining, where you get your physical, mental exercise...as well as...socializing with your own peers"</i></li> <li>• Change the "LIFE<sup>1</sup> program" to twice a week free, third time at 75% [cost reduction] and fourth time at 50% and so on; <i>"equal access to the [recreation] centres...and not be limited in that"</i></li> <li>• Open more parks <i>"with something to do in them"</i> (e.g. <i>"turn some of these park places into a real low cost par 3 golf course"</i>)</li> </ul>
Physical and financial accessibility: "make it easily accessible"	<ul style="list-style-type: none"> <li>• Make venues physically accessible for people with disabilities</li> <li>• Make activities, events and programs financially accessible, <i>"subsidize it for the ones who need it", "lower the prices...where people could afford to go", "we need funding, especially for transportation", "more access to things and places", "put in a facility, such as swimming...exercise room...but not a phenomenal fee, where people could afford to go...make it strictly for low income"</i></li> </ul>
Advertise and communicate: "get the word out there"	<ul style="list-style-type: none"> <li>• <i>"People...could learn an awful lot here but they just don't know about it or they just don't care. So they need to be informed...welcomed and brought in [to use the rec centre and its programs]...invited in...a lot of people won't admit they need help"</i></li> <li>• Develop <i>"a strategy to motivate people", "there used to be ParticipACTION in this country, an organized, sponsored effort to get people busy...might help if there was a national strategy like that again"</i></li> <li>• Address the lack of knowledge about community organizations and services, <i>"You have to get the word out there", "there's not enough information out there for activities"; "there are organizations and people out there but they are not readily available....they're not advertised. You have to go looking and you have to have incentive, you've got to have somebody or something...that made us realize that there are other things out there, there are other people out there, there is help there"</i></li> <li>• Repeated advertising of health promotion messages (health communication, social marketing); <i>"it [disease prevention] has to be presented many, many times"</i></li> </ul>
Work with schools	<ul style="list-style-type: none"> <li>• Promote activity in schools, focus on education and do <i>"anything in the school front"</i>, such as create more supportive environments in school and activity <i>"in a non-competitive environment"</i></li> <li>• Provide <i>"more education for kids"</i> on topics such as <i>"how to eat, how to get along with people, how to understand people"</i> and nutrition education for parents</li> </ul>
Shift workplace culture	<ul style="list-style-type: none"> <li>• Encourage healthy eating and activity, <i>"put fruit out instead of vending machines...have [walking] programs in place"</i> and offer programs such as <i>"bike to work week...every week or every month"</i></li> <li>• Change attitudes, <i>"Some places just don't get it when it comes to family and health, healthy mental health...I would like to see changes in attitudes of professionals and workers"</i></li> </ul>
Food accessibility and healthy choices	<ul style="list-style-type: none"> <li>• Increase food accessibility, <i>"the Food Bank only gives enough food that will last a week"; [after paying rent] "there's nothing left over for food or the telephone...I just started thinking, ok I don't need to eat"</i></li> <li>• Make healthier food options readily available at restaurants, events, and stores</li> </ul>

<sup>1</sup> Leisure Involvement For Everyone program assists individuals and families with low incomes to access Saanich Recreation programs and services.

## Chapter 5

### Discussion

Behaviours that were once thought to be largely determined solely by individual choice are now viewed as also occurring in a social context. As Berkman and Kawachi (2000) explain, “Individuals are embedded in societies and populations...environments place constraints on individual choice” (p. 7-8) and this includes the choice to be physically active, which is influenced by one’s place in society. Furthermore, “psychological states, behaviors and aspects of the physical or built environment are influenced by social environments and vice versa” (p. 6). This chapter reflects on participants’ experiences of physical activity as understood through ecological and social capital perspectives. Findings provide evidence for the significant role social capital plays in encouraging physical activity among a particular group of people living with low incomes. The analysis is descriptive and describes associations between factors that should not be considered causal relationships. This study furthers our understanding of the multiple levels influencing physical activity, the relationship between factors within these levels, and provides insight into how activity can be supported and encouraged from the perspectives of people of low incomes based on their lived experiences.

#### *Ecological Model and Social Capital*

“Consideration of individual, interpersonal, community, organizational, policy, and environmental influences, as well as the dynamic exchange between these levels, is viewed as more accurately reflecting the personal experience that frames behavior and health” (Brennan et al., 2003, p. 741). Kawachi and colleagues (2004) suggest that the effects of social capital on health be analysed on a multi-level analytical framework since it involves

both the individual and the population level. Thus, the concept of social capital is aligned with the framework of an ecological model, as it incorporates all of its three levels. Themes identified in the data support and relate to the concept of social capital. This concept assists in understanding or interpreting how this particular group of participants viewed the relationship between factors influencing their decisions to continue being physically active more so than theories emphasizing individual roles and behaviour change. However, it should be noted that there were aspects of individual behaviour change models that were revealed in the data and further research could examine whether these play a role at later stages in exercise adoption and adherence for people of low income. In their examination of influences on physical activity among three socioeconomic groups, Burton et al. (2003) state that a prominent influence on physical activity for high and mid (but not for low) socioeconomic groups included efficacy. However, data in this study on people of low income revealed that behaviour change can act as a function of perception of one's efficacy (ability) to initiate change or exercise control (Bandura, 2004), as stated by one participant, *"you have to have the initiative to, to go out there and want to help yourself"* [group mapping, female #2]. Campbell, Williams, and Gilgen (2002) found that self-efficacy is more likely to be experienced by members of a cohesive and trusting community, increasing the likelihood of engaging in health protective behaviours.

The ecological model with a focus on social capital provides the best explanation for this study's findings, whereby the existence of social capital influenced a health behaviour (physical activity) through intrapersonal factors such as knowledge, skills, and attitudes for being active. Social capital also influenced interpersonal factors such as psychosocial processes, self-esteem, mutual respect, social support, inclusion and establishing norms of

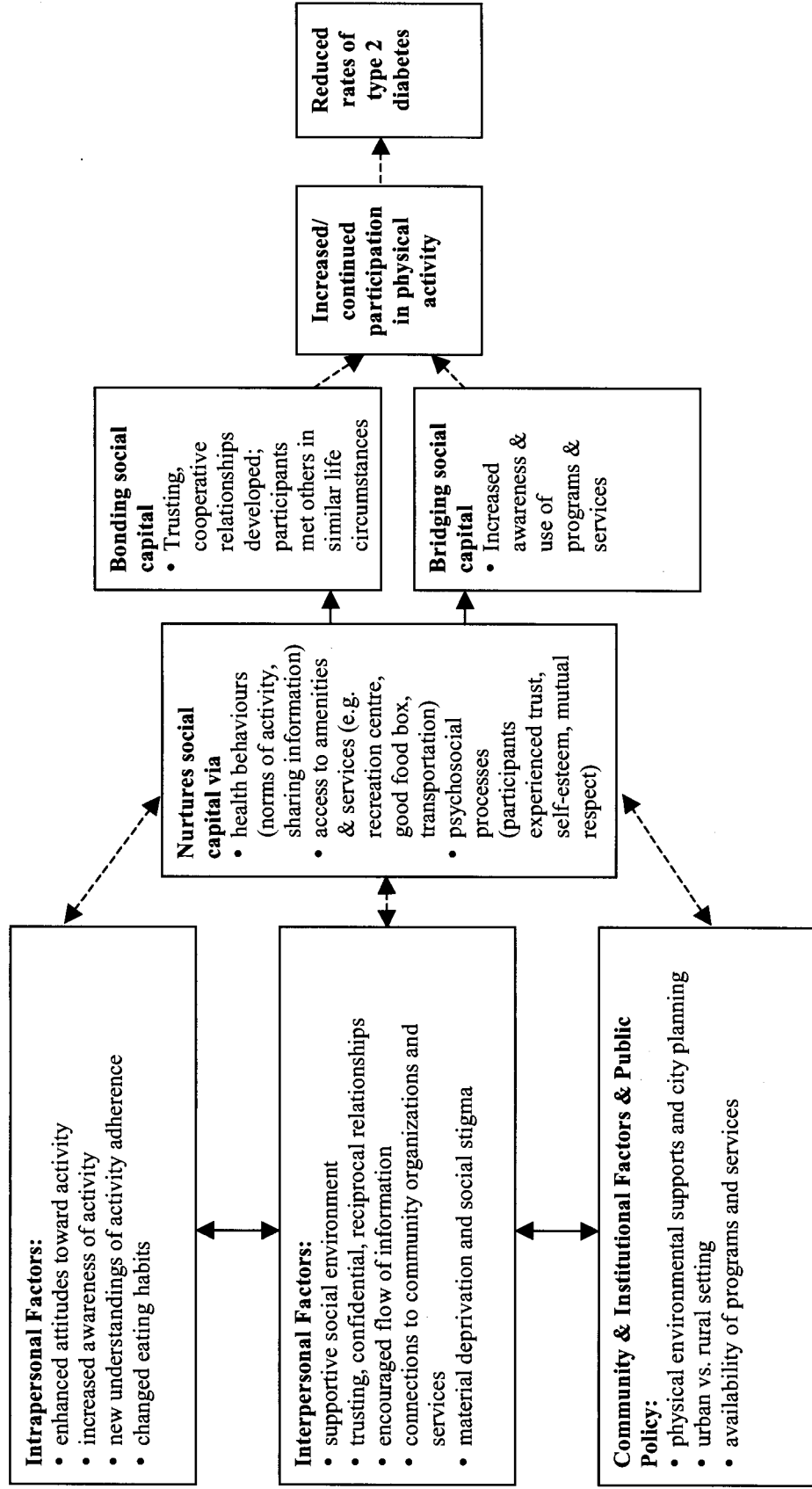
healthy behaviours. This study found that social capital contributed to some of the environmental factors thought to influence continued participation in physical activity. Environmental factors included access to amenities and services, such as a recreation facility, transportation to various organizations, and dissemination of information in a cohesive and trusting setting.

Social networks are the structural characteristics of an individual's social ties and connections (e.g. reciprocity, frequency of contact) (Glass, 2000). Networks provide opportunities for psychosocial mechanisms such as social support, social influence, social engagement, access to resources, person-to-person contact, and material goods (Berkman & Glass, 2000). These mechanisms are believed to impact health through various pathways which include, but are not limited to, health behavioral pathways (e.g. physical activity) and psychological pathways (e.g. self-esteem, self-efficacy, sense of well being).

Types of social support evident in this study included instrumental (help from others with needs, such as obtaining a good food box or transportation), informational (physical activity and diabetes prevention education, community resources), and emotional (understanding from others). As evidenced in a group discussion "*I'm listening to everyone talk and...I might have different experiences from what I've heard but I'm feeling a sense of real support in this room*" [group mapping, female #1] and in response another participant commented, "*well, that's what we're here for*" [group mapping, male #1]. Findings are supported by Burton et al.(2003) who argue that social influences on activity include encouragement, assistance (e.g., transportation), and affiliation/companionship. Social influence provided normative guidance whereby participants compared attitudes with people who were similar to themselves and social norms existed toward help-seeking and adherence

to activity. Networks provided opportunities for social engagement and participation in group activities (i.e. physical activities, visiting local agencies), opportunities for companionship and sociability, and defined meaningful social roles which provided a sense of value and belonging. Social integration or connectedness gives “meaning to an individual’s life by virtue of enabling him or her to participate in it fully, to be obligated (in fact, often to be the provider of support), and to feel attached to one’s community” (Berkman & Glass, 2000, p. 147), contributing to social cohesion, meaningfulness and interdependence rather than isolation. Social connectedness has been argued to be one of the most powerful determinants of well-being, with social integration, support, and affiliation being linked to preventing premature death and disease and the “positive contributions to health made by social integration and social support rival in strength the detrimental contributions of well-established biomedical risk factors like cigarette smoking, obesity, elevated blood pressure, and physical inactivity” (Putnam, 2000, p. 326-327).

Finally, networks provided opportunities for improved access to material goods, resources and services through referrals and institutional contacts. Social capital was found to support participation in physical activity and findings also revealed individual level barriers, including internal barriers (lack of time) and external barriers (lack of money, lack of transport, illness/disability). These findings support recent evidence that physical inactivity is affected by individual factors and social participation (Lindstrom, Moghaddassi, & Merlo, 2003). An ecological model incorporating the findings from this study as it relates to the concept of social capital, and rates of physical activity and type 2 diabetes is shown in Figure 4.



---> Indicates a theoretical relationship based on ecological model and social capital concepts in the literature.  
 —> Indicates relationship based on study data.

Figure 4. An ecological model incorporating the findings of this study as relating to the concept of social capital, and rates of physical activity and type 2 diabetes.

### *Social Capital*

Social capital exerts compositional and contextual effects that may account for variations in health behaviours (Campbell et al., 2002). For example, socially isolated individuals may live in areas that are low in social capital which provide fewer opportunities to form social ties (compositional effect) (Kawachi & Berkman, 2000). According to Cattell (2001) “both social exclusion and concentrated poverty imply some form of impoverished social networks” (p. 1502). One participant explained,

I can't say that we have the friends that we had before we became low income due to circumstance, whatever are not the friends we have now...and basically that's because we couldn't afford to keep up with them and they couldn't deal with the fact that we were incapacitated as far as being able to do a lot of things that they liked to do. [interview #2]

Social integration through physical activity is a way to encourage camaraderie and the use of social programs, as seen in the Homeless World Cup. This international football (soccer) tournament develops team support, creates opportunities for success through physical training and encourages participation in social programs, all of which influence self-esteem, feelings of belonging and positive life changes (The Homeless World Cup, 2004).

### *Health-related behaviours.*

Social capital may influence health related behaviours through the dissemination of health information and through norms of health behaviour, particularly in situations of social cohesion whereby people know and trust each other (Kawachi & Berkman, 2000). Social support and guidance that raises individuals' self-efficacy during behaviour (e.g. physical activity) adoption or maintenance increases long-term success (Bandura, 2004). Furthermore,

social cohesion has been found to be associated with increased levels of physical activity (Fisher, Li, Michael, & Cleveland, 2004), which is reiterated in this study; one participant provided an example of how the SPDPP program and its facilitator, who acted as a mentor and incentive for taking action, motivated her to take responsibility to address a community issue by connecting with others to create a physical activity opportunity that benefited herself as well as others,

Coming here [to the SPDPP and Panorama] made me realize that I had to keep going and that was... incentive for me to...say hey look, there's problems here. These people [neighbours]...aren't getting exercises and going to the Board of Directors [at her retirement housing complex] as I did was a big step for me...and actually getting a result was wonderful. And I think, J\_ was my mentor in, in that I guess if she can do it I can too and I proved that I could...knowing that there are people in the community that actually do care... talking to the Board of Directors at the complex and getting this exercise program set up so that they were paying for it... they had said...if you have enough interest we will pay. Well, we got enough interest and they are paying, so it's one way of getting you know, a little bit of exercise in not just for myself but for everybody. [interview #2]

Social connections made through the program acted as a motivator,

Our life did a, a tail spin I guess I gave up and thought oh poor me and, and it's easier to sleep your troubles away than to get up and face them and that was my mode for a long, long time. And it took getting out and...seeing that there are people in same boat as you are and they're not sitting around feeling sorry for themselves, so get off your duff and do something. [interview #2]

Information flows (e.g. learning about organizations and programs, exchanging ideas) depend on social capital (Putnam, 2000) and for participants, being part of a social network encouraged a flow of information between people, as one participant's story describes,

Meeting new people...finding out that I'm not only one with depression. To find out that there are different levels of depression. To find out that I'm not the only person...who's in my situation of being on the poverty line so to speak, of making less than eight thousand a year it's, it's not healthy living at all. You know it's hard to live healthy in that manner. But most of all I would have to say it's meeting the people and finding new avenues, you know, finding out what the Food Bank is like on the inside. Finding out about programs like the food boxes that you can buy that are reasonably cheap. [interview #3]

This flow of information was not only described by participants as occurring in 'A Taste of Healthy Living' programs but during this study's group mapping activity it was evident as well, "*I got some information I'll pass it out, I ran into another Good Food Box type of thing*" [group mapping, male #4]. Finally, a healthy behaviour such as healthy eating was also connected to making a better community by helping others, as one participant explained,

When I feel good about myself, when I'm non-stressed and eating well I'm able to carry out my job well and make a difference in kids' lives, in parents' lives, help single moms or help kids that come from divorced families or just give them a laugh or help them out too. [interview #1]

*Access to services and amenities.*

Health may be influenced by access to services and amenities which are directly relevant to health (Kawachi & Berkman, 2000). Social capital facilitates coordinated actions (Newton, 1997) which support access to services, as indicated by one participant,

The group has problems that we can organize because we are a group that we couldn't organize because we were individuals...the Food Box I would have found it really difficult to carry, if not impossible a cardboard box of food but \_ [refers fellow program participant] has offered to go. [group mapping, female #1]

Connections to community organizations and services, such as the SPDPP, also influenced activity, further social networking, involvement in organizations and finding help or utilizing resources in the community. One participant explained that, "*knowing people in the community, things that they're doing, it makes me aware of all the different programs out here*" [interview #1]. In another participant's words,

This program made me realize that there's a lot of things out there you can do that doesn't have to be centered around diabetes...and...that don't cost a lot of money but have to be made aware of them and this program made us aware that there are organizations and people out there but they are not readily available ...they're not advertised. You have to go looking and you have to have the incentive, you've got to have somebody or something and J\_ [facilitator] was the somebody and the program was the something that made us realize that there are other things out there, there are other people out there, there is help there. [interview #2]

This study's findings are supported by similar findings by Burton et al. (2003) who explored how psychological, social, and environmental influences on recreational physical

activity were patterned by socioeconomic position. Among the low socioeconomic group influences included inconvenient access, poor health, and low personal functioning (due to advancing age, chronic health conditions and associated pain, risks of potential injury and further complications). This was in contrast with participants of higher incomes “who described easily obtaining information, access, and introductions to [recreational physical activity] through social and professional networks” (p. 234). Influences across all groups included “previous opportunities, physical health, social assistance, safety, environmental aesthetics and urban design, physical and health benefits, and barriers of self-consciousness, low skill, and weather/time of year” (p. 225).

*Psychosocial processes.*

Finally, social capital may influence health by affecting psychosocial processes, such as feelings and values of trusting social environments and relationships, support, self-esteem, mutual respect, and reciprocity (Kawachi & Berkman, 2000; Newton, 1997). For example, most notably, the SPDPP programs fostered trusting and supportive relationships among a group of people who “*holds together and supports each other*” [interview #5] resulting in “*enjoyable time spent*” [interview #7]. Among people of low and mid-socioeconomic status, physical activity has been identified as demanding and effortful (Burton et al., 2003), as found in this study however, it was also perceived as “*fun*” and participants “*felt better*”. While participants in this study mentioned effects of poverty including loss of self esteem, stigma, powerlessness, lack of hope and feelings of demoralisation, Cattell’s (2001) study examining poverty and social capital linked such processes to negative health outcomes.

Behaviours are socially patterned, thus they occur in a social context and the “social environment influences behavior by 1) shaping norms, 2) enforcing patterns of social control

(which may be health-promoting or health-damaging), 3) providing or not providing environmental opportunities to engage in certain behaviors, and 4) reducing or producing stress for which certain behaviors may be an effective [short term] coping strategy” (Berkman & Kawachi, 2000, p. 7). Networks also foster norms of reciprocity (Newton, 1997). Describing how she felt in the social environment of the program, one program participant offered an example of the reciprocated support and help that had developed in the group,

Very safe, ya and very comfortable and, and helping one another if there was you know I don’t mean, not physically helping but just the fact that everybody was there and those that normally wouldn’t...participate in things felt that they could. When they said, said where they were going and I thought ‘oh my god all that walking.’ I walked it. I did it and had no problem with it and I think part of it was well I’m here, I said I would come. I have to do this and I didn’t want to let the rest of them down by saying well I can’t do this and holding people back...I would say well go on ahead and others would kind of lag back and make sure that I was ok, ya, a good group.

[interview #2]

Networks may reinforce healthy norms (Putnam, 2000) and inclusive activities (e.g. touring the Institute of Ocean Sciences and trail walking) created environments of social integration where participants were able to “*meet people of other social and financial levels and not feel that you are...isolated.*” Socially isolated people are more likely to smoke, drink, overeat and engage in other health-damaging behaviors (p. 327). Others mentioned the positive outcomes of realizing that people were in the same situation as themselves (e.g.

(struggling to live with a low income, depression, painful chronic health conditions), as one participant explained,

It [SPDPP program] got me out of the house and interested in my own problems as far as doing something about them... and the diversity of people that were there was fantastic, different problems...it makes you realize you're not the only one with particular problems." [interview #2]

Wilkinson (1997) identifies the following psychosocial risk factors that mediate between health and socioeconomic circumstances: low control, insecurity, and loss of self esteem. However, social integration influences self-efficacy, emotion, mood, and perceived well-being, for example socially isolated individuals are at increased risk of depression, and social support buffers the influences of stressful life events on the risk of depressive symptoms (Berkman & Glass, 2000). One participant shared her story, "*I've gotten to meet people who can understand and were helpful and they like me to help them which is important because that gives me something for my self worth*" [group mapping, female #1].

Findings involved the topic of trust and a dominant perspective voiced by participants was that society "*doesn't trust their fellow man anymore*" and "*you have to be very, very careful.*" According to Putnam (2000), "survey reports about honesty and trust should be interpreted prima facie as accurate accounts of the respondents' social experiences" (p. 138). As well, he states that "in virtually all societies "have-nots" are less trusting than "haves," probably because haves are treated by others with more honesty and respect...the financially distressed (express) less (social trust) than the financially comfortable" (p. 138). Perceived neighbourhood safety has been linked to physical and mental health (Ziersch et al., 2005). Social trust has been linked to income distribution and mortality (Wilkinson, 1997) and lower

levels of social trust are associated with higher rates of most major causes of death, therefore increasing trust levels would result in a lower level of mortality (Kawachi & Berkman, 2000).

Lack of connections with the community was also identified by participants, “*you gotta put yourself out there if you want to get to know the community. The community won’t come to you*” [group mapping, male #1]. Another participant explained, “*where I live...everyone has their attached garage and they push a button and the door goes up, they put their car in, then they go via a doorway into their house. No one sees them*” [group mapping, female #1]. Another participant agreed and shared his thoughts on the subject, “*there a lot of people have their community within in their house. They have their friends that come over, and they play poker, have their parties whatever and then they all get back in their cars and disappear*” [group mapping, male #1]. One reason for this lack of sense of community may be due to “suburbanization...where people keep to themselves and one’s social life is private with lives centered inside the house rather than the neighborhood or community” (Putnam, 2000, p. 208).

Participants found that trust and a sense of community could be fostered through the development of social connections, “*even on the bus if you’re sitting next to someone who’s had a real bad time of it there is a connection there and that, that can work out to be...encouragement*” [group mapping, female #1]. As indicated by participants, involvement with the SPDPP program fostered social support, cohesion, trust and a social network, which has the potential for far reaching positive outcomes since better integration into a network of social relations benefits health (Wilkinson, 1997) and trusting connections with others develops or maintains character traits that are good for the rest of society (Putnam, 2000).

Similar to the findings of Glover (2004b), involvement in a community centre fostered awareness about community-wide issues, giving back to the community and taking responsibility for addressing community problems.

### *Bridging and Bonding Social Capital*

The SPDPP program also contributed to the health of participants by encouraging physical activity through various forms of social capital. One example of bonding capital is that participants “*got to meet and know people*” in a social environment that maintained “*confidentiality so people are able to talk...it feels good like I trust them, they trust me.*” This study echoes Cattell (2001)’s findings that participating in local activities has health promoting qualities, including making friends, becoming more confident and assertive, as evidenced by the statement, “*I come here to support people...and I know I’ll get supported. So if I do come here with a real odd downer, I have the odd time come to our group, by the time I left I felt better*” [group mapping, male #1]. Social support provides a buffer from daily stressors and in-person interactions are more therapeutic, as opposed to ties “that are geographically distant” (Putnam, 2000, p. 332).

Bonding social capital has been described as trusting and co-operative relationship between members of a network of people with similar social identity (Szreter & Woolcock, 2004); one participant provides an example of bonding social capital with a description of her initial fear of people and how positive relationships contributed to her individual development, “*I’ve gotten to meet people who can understand and were helpful and they like me to help them which is important because that gives me something for my self worth*” [group mapping, female #1]. In her qualitative research, Cattell (2001) also found that becoming involved changed lives through increased networks, and improved health and

sense of well being, including self worth, as well as self esteem, a sense of achievement, perceptions of control, hope and optimism. One participant commented, *“I was feeling very sorry for myself having to give up the exercises [couldn’t afford to pay for fitness membership]...and oh well I might as well give up and then J\_ [program facilitator] came along and it was like, hey you know there is, there is hope”* [interview #2].

Bridging capital is indicated by the increased comfort with, and awareness and use of community programs and services. One participant provides an example, *“the L.I.F.E. program...I wasn’t even aware about it. I didn’t even know that you could if you were below a certain wage level whether you could take part in this. So that’s been a big thing for me”* [interview #5].

In her investigation of poverty and social capital, Cattell (2001) stated that “social capital produced by self interested groups [e.g. SPDPP programs] can frequently be limited to that group” (p. 1505), however she found that bridging ties were being developed, which according to Putnam (1995) are essential for generating wider social trust. A study by Greiner, Li, Kawachi, Hunt, and Ahluwalia (2004) found that physical activity is associated with involvement in community groups or organizations. ‘A Taste of Healthy Living’ programs facilitated the development of bridging capital whereby physical activity norms were reinforced through the social network of the group by connecting participants with community organizations that support the individuals’ activity goals (Emmons, 2000) (i.e. L.I.F.E. pass at Recreation Centre, learning about the Food Bank, organizing an exercise program in a housing complex).

### *Conclusion*

This research has attempted to contribute to our further understanding of participation in physical activity, in the context of a community based intervention, as experienced by people of low income. This understanding has been framed by the theoretical perspective of an ecological model and concept of social capital. Study findings suggest that social capital is worthy of further consideration in research and intervention efforts focusing on increasing physical activity for people of low income. Burton et al. (2003) suggest that the pattern of psychological, social, and environmental influences on physical activity may differ in relation to socioeconomic status. Furthermore, Emmons (2000) identifies a critical problem of many theoretical models and interventions addressing health behaviour change, that they have been developed and evaluated on middle-income populations with little attention to their effectiveness in interventions with low-income populations. Incorporating social contextual factors in intervention programs targeting people of low income is critical, as argued by Emmons (2000), "Efforts to intervene upon health behaviors without considering the social context in which they occur will be limited in their effectiveness, particularly with lower-income populations that have achieved less benefit from the behavior-specific interventions that have been conducted to date" (p. 249).

Effective and long term individual health behaviour change requires interventions targeting all levels of the ecological model including the individual, individual's environment, interpersonal relationships, communities and policies (McLeroy et al., 1988; Stokols, 1996). According to Emmons (2000) maximizing environmental level changes is the focus for future research and individual behaviour change interventions. Findings of this research may assist in informing interventions and environmental and/or policy changes to

promote physical activity for people of low income, with particular emphasis on enhancing social capital and incorporating social contextual factors of behaviour change.

These findings support others' arguments that social capital is associated with positive health outcomes (Campbell et al., 2002; Putnam, 2000). When social capital is applied to the field of health promotion from a community perspective, it has been found to enable and support health-enhancing behaviour, positive community networks and "relationships that serve as a buffer to health-damaging stress" (Campbell et al., 2002, p. 42), all of which were findings in this study as outcomes of 'A Taste of Healthy Living' program participation. Further theoretical and practical research is needed to explain how social capital links to health (Campbell, Williams, & Gilgen, 2002) and how recreation contributes to social capital and the promotion of physical activity, health, and disease prevention, particularly when viewed beyond individual risk practices or attributes to include the larger social and environmental context.

Income inequality is related to mortality rates (Kawachi, Kennedy, Lochner & Prothrow-Stith, 1997) in that people living with higher incomes have a longer life expectancy and live in better health than those of low income (Canadian Institute for Health Information [CIHI], 2004). People of low income also have limited access to recreation and although user fees offset costs, "those who cannot afford the fees participate less in cultural and recreational programs or not at all" (p. 10). Kickbusch and Payne (2003) note that as governments struggle to cope with escalating health care costs, health promotion is becoming increasingly privatized and commercialized where "access through the market makes healthy individuals even healthier, and leaves those with low health purchasing power behind" (p. 277).

A Taste of Healthy Living, as a furnished program, responded to the needs of citizens who typically did not participate in public recreation activities. The program introduced them to a variety of recreational opportunities, settings and healthy possibilities in a trusting and supportive environment. As a result, participants became more connected to their fellow citizens and engaged with the community's resources. Along with others (e.g., Galea, Freudenberg, & Vlahov, 2005), the SPDPP and this study's findings suggest that municipal recreation, particularly in partnership with community-based organizations, has the capacity to influence the socioeconomic environment affecting health that may diminish the negative effects of social exclusion (Baum, Garofalo, & Yali, 1999; Raphael, 2003; Wilkinson & Marmot, 1998). Thus, recreation represents an agent that can redistribute "social wealth"<sup>3</sup> via regional, provincial or federal funding "...to ensure that all, including the temporarily and permanently dependent, the marginal and the unfortunate, are permitted their equal chances to participate to the full in the community's life" (Szreter & Woolcock, 2004, p. 8).

Physical activity in a recreation environment has a significant positive impact on a community, provides a means to build social capital and promote social connectedness, and pays for itself through reduced use of health and social services (Torjman, 2004; Browne, 2003; Slack, 2003). Despite positive results from participation in recreation, these programs and services are often first to be subject to government cuts (Torjman, 2004). Therefore, an argument exists for the support of and better funding for recreation programs, that create a health promoting community among its participants. Evidence for this argument is provided by participants' statements regarding their support for and use of subsidized recreation

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<sup>3</sup> Social wealth is an indicator of how a community sustains itself over time and allocates various forms of capital to satisfy collective needs (Willapa Alliance, 1995).

programs (e.g. L.I.F.E. program) which influenced their adherence to physical activity, as well as their comments for more programs as a suggestion to encourage physical activity.

## Chapter 6

### Recommendations for Future Research, Policy and Practice

This study is considered ‘applied research’ of which the purpose is to understand the nature and sources of human and societal problems (i.e. physical inactivity and diabetes prevention) and the research questions are considered of societal importance (i.e. increasing rates of physical activity). As outlined in the previous chapter, the results of this research include confirming the utility of both the ecological model and social capital theory related to physical activity that can be used to formulate physical activity programs, environmental supports and chronic disease prevention interventions. This chapter focuses on suggestions for encouraging physical activity, future research areas, and implications for policy and practice based on study findings.

#### *Future Research*

This study identified a construction of the ecological model and physical activity that emphasized positive associations with social capital. However, by focusing on participants who had completed a healthy living program it is possible that less active people or those who had not participated in a SPDPP program could view physical activity and its connection to social capital differently. Concentrating on such individuals was outside the scope of this study, however this is a notable topic for future research. As supported by Roussos and Fawcett (2000) “more research is needed to identify generic intervention strategies (e.g. enhanced social support, modifying access, and barriers) that would, if implemented, yield optimal improvements with multiple public health outcomes (e.g. ...increased prevalence of physical activity...)” (p. 392). Research is needed to examine and further understand the causal relationships between variables influencing physical activity, increase evidence,

collaboratively create interventions, make changes to settings, facilities and programs, and develop and implement policy initiatives that create physical and social environments that are more supportive of physical activity (e.g. to address physical activity determinants and build social capital).

Social capital and income inequality are concepts that are inherently ‘ecological’ (i.e. examining characteristics of *places* rather than people) so in order to further understand and apply these concepts, future research could examine where people live in addition to their health practices (Kawachi & Kennedy, 1997). An ecological perspective incorporates the effects of the social and physical environment on individual or population health. It is a high priority to further explore environmental variables and develop models to predict conditions which promote and support physical activity (Handy et al., 2002). “There is interesting and important work to be done to explore the potential influence of the physical and social environment on human health or health behavior” (Macintyre & Ellaway, 2000, p. 333), contributing to further understanding of processes that shape individual and population health and interventions to improve health. Despite frequent discussion and emphasis on the importance of contextual or environmental influences on health, “little research has been done on the health-promoting or health-damaging characteristics of such contexts; most research has focused on their expression in individual life circumstances and health” (p. 337).

There is a call for the development of more complex social capital methods and instruments in the public health field, while also considering socioeconomic factors such as income (Ziersch et al., 2005), due to the lack of uniformity and methodological rigour across studies in choosing indicators to measure social capital (Kawachi et al., 2004). Presently, the concept of social capital is contested and there is no consensus on how social capital should

be measured (Portes, 1998). However indicators of social capital have been linked to health outcomes, such as mortality rates, self-rated health, violence rates, mental health and high risk behaviours (e.g. smoking) and sedentary lifestyle (Greiner, et al., 2004). Further understanding the concept of social capital is viewed as essential in developing social policies relating to social capital and health inequity (Ziersch et al., 2005). More specifically, Brennan and colleagues (2003) recognize a need for methodological research to incorporate perceptions of the social and community environment and address measurement issues, as their research indicates that measures assessing these perceptions may not be relevant indicators of physical activity for various income levels. Additionally, they question the comprehensiveness of scales measuring community perceptions since measures used in their study were based solely on theoretical or deductive approaches and did not incorporate inductive or participatory approaches. Finally, researchers must be aware of the negative aspects of social capital, such as the exclusion of groups, class or race/ethnicity where social capital is made available or encouraged to certain groups thus reinforcing health disparities (Kawachi, 1999).

Health strategies are shifting from individual explanations for inactivity to include a focus on activity in the social and environmental contexts of routine behaviour and daily habits. Therefore, research methods and theory development need to reflect the incorporation of sociocultural and environmental influences on behaviour change and consider the impact these factors have on increasing participation in physical activity. Emmons (2000) pleads for health behaviour research that moves beyond individual and interpersonal level behaviour change interventions to explore the integration of social, governmental and policy level factors and argues that individual approaches can be integrated into efforts to intervene at

other levels. This is supported by Brennan et al. (2003) whose work highlights the influence of perceived social and community factors on physical activity and supports the need to “examine individual behaviors in the social, physical, political, and organizational environments in which they occur” (p. 752). They go on to suggest that future research and practice could develop and evaluate interventions that enhance social and community factors, such as building a sense of community in order to foster support for physical activity. Finally, due to a previous focus of health research on vigorous activity, a focus on moderate forms of activity such as walking or cycling have not been emphasized in other fields, such as transportation planning, therefore a need exists for further multi-disciplinary work in order to design and rebuild healthy, active communities.

*Community-based participatory research.*

“Social determinants of poor health can only be addressed by societal solutions” (Heymann, 2000, p. 369). Increased physical activity levels have been linked to behavioural, social and environmental correlates, therefore community based interventions promoting activity are critical to increasing activity levels (Kahn et al., 2002). Community based research and interventions that reach a broader range of people than commonly reached through clinically oriented approaches or studies have proven to be successful health strategies for increasing physical activity levels (King, 1991). In the development of meaningful policy and practice, the application of community based participatory research (CBPR) principles, is seen as an important mechanism to help make epidemiological findings locally relevant and context specific and promote larger structural change at a population health level (Leung, Yen, & Minkler, 2004). Participatory, as well as combined qualitative and quantitative research have the potential to provide a more comprehensive understanding

of individual perceptions of the community and objective community indicators and their roles in promoting physical activity. Participatory methods can assist in identifying and utilizing community strengths and processes in partnerships and interventions so that when utilized in conjunction with theoretical perspectives, can identify appropriate constructs and indicators/measures (Brennan et al., 2003). Greiner and colleagues (2004) found a positive association between levels of physical activity and community involvement, and community members' perceptions of their neighbourhoods (ratings) were strongly related to their health states and behaviours. These researchers concluded that improving ratings will require structural interventions within communities (focused on social change), therefore providing support for community based research investigating the development of social capital and positive community perceptions.

Community-based participatory research (CBPR) facilitates collaborative, equitable partnerships throughout the research process (Israel et al., 2002). Research is needed to guide interventions and collaboration and integrate knowledge among practitioners, professionals and researchers of different disciplines (Craig, Brownson, Cragg, & Dunn, 2002). Restated by Roussos and Fawcett (2000) "collaborative partnerships (people and organizations from multiple sectors working together in common purpose) are a prominent strategy for community health improvement" (p. 369). Professionals from disciplines such as sport and exercise sciences, behavioral epidemiology, health psychology, transportation, urban design and planning and architectural sciences (Owen et al., 2000) as well as schools, government and local citizens need to contribute to research, apply findings and work together to enhance neighbourhood environments. The challenge and importance of developing relationships with people in different disciplines within the field of CBPR has been acknowledged (Katz, 2004;

Syme, 2004), as well as its labour and time intensive nature (Leung et al., 2004). However, working outside disciplinary silos, utilizing a multidisciplinary approach, and forming partnerships built on trust and equity in a collaborative process are important so that communities determine their priorities and needs and participate in identifying suitable intervention methods and solutions for enabling change.

CBPR may also be effective in making lasting change to design activity back into people's daily home and work lives because it involves the community throughout all stages of the research process and could focus on local needs (e.g. social and physical environments) or health problems, such as physical activity that are relevant to the community. CBPR can contribute to the further examination of social environmental factors shaping psychosocial processes and informing interventions to positively influence health; community empowerment and social network mobilization can be used to reduce access barriers (Glass, 2000).

### *Policy Implications*

Strong support exists for the development of policies that will improve the health of today's adults, as well as that of children, the next generation of adults (Marmot, 2000). The intent of this section is not to debate social policy but to recognize the multifaceted and complex nature of social determinants of health and acknowledge that determinants such as income inequality, social exclusion and food security, as identified by participants in this study, influence participation in physical activity. Heymann (2000) notes that addressing social inequalities, discrimination and social conditions is complex and influenced by social policy. The Auditor General of British Columbia emphasizes that in order for diabetes prevention to be effective, it requires changing social norms and social settings (Auditor

General of British Columbia, 2004). Causal links between study findings and associations with social capital and continued physical activity are not inferred, however it is recognized that social capital developed through the SPDPP prevention programs have impacted health behaviours, such as physical activity.

Although limited evidence exists of the effectiveness of collaborative partnerships in improving community-level outcomes, the visible and/or measurable changes in community or population health outcomes may not be detectable for three to ten years (Roussos & Fawcett, 2000). Theoretically, long-term effectiveness can be considered the gold standard for policies, however, from a practical standpoint, for policies to be passed the results or impact must be felt promptly (Heymann, 2000). Practitioners must show results and usefulness in policy, methods or programs. This will assist in affecting social change which “requires sustained public support and political will” (p. 369).

In order to improve health behaviour outcomes, Emmons (2000) suggests developing and evaluating macro-level policy and environmental interventions promoting health behaviours. More specifically, Ziersch et al. (2005) suggest social capital research examine how macro-level economic policy affects the ability of communities to promote social capital and how social capital can be utilized to address health inequities. They argue further that “policies need to be driven by an understanding that social capital may be quite different, for example, for well educated compared to less educated people, or for people living in poor neighbourhoods compared to those in rich ones, or for those in the workforce and those who are not in the workforce” (p. 12). Recognition must be given to the fact that while individuals may want to create a neighbourhood characterized by high social capital, it may be shaped by social and economic forces that are beyond individual control. Social capital is a resource not

equally distributed across populations and the context of broader social and economic factors influence health and social capital.

Creating a healthful environment means altering or adapting social, economic and physical surroundings in ways that preserve and enhance health (Frankish, Milligan, & Reid, 1998). A common view held by urban planners, engineers and architects is that street design elements should be set by motorists' needs as a street's central purpose is to move motorized traffic efficiently and pedestrians hinder the flow of motorized traffic (Frankish et al., 1998). Perhaps it is time for this view to be challenged in order to improve environments to better support physical activity. This argument is based on evidence that street design focused on car traffic makes it difficult, unpleasant and dangerous to walk, jog or cycle alongside most non-residential streets (Frank et al., 2003). Study findings revealed factors influencing activity including physical environmental supports (i.e. bike lanes, walking trails, green space), accessibility of facilities and programs, safety, and city planning (e.g. being able to walk around a town). This was similar to Burton and colleagues (2003) who found that availability of facilities, safety, aesthetics and neighborhood design (i.e. footpaths, hills, traffic) influenced activity. Furthermore, findings by Greiner et al. (2004) indicate that physical activity is positively associated with ratings of the community. Given that government policy is in support of the development of more pedestrian-friendly living areas, there is a need for culture change among engineers, planners and others to move forward with these developments (Mullan, 2003). As evidenced by participants' comments about environmental influences (e.g. community design and availability of programs and services in theme #4) environmental changes could enhance social capital (Putnam, 2000) as well as physical activity (Frank et al., 2000).

Access to opportunities for healthier living, such as recreation and public transportation, are limited in more socially disadvantaged areas (Macintyre & Ellaway, 2000). However, Giles-Corti and Donovan (2002a) found that even when people living in low socioeconomic status (SES) area had equal or greater access to recreational facilities compared to those living in higher SES areas, they were less likely to use them. This may be due to low visibility of activities at the recreation facilities, and cost, since participants were less likely to use facilities that involved entrance fees. In addition, perceptions of the neighbourhood environment differ with socioeconomic status; perceptions that a park was within walking distance were 50% lower among those living in low socioeconomic status areas. This population was also less likely to perceive that their neighborhood was attractive, safe, interesting, and that there was social support for walking (Giles-Corti & Donovan, 2002a).

Knowing that activity is associated with social and physical environmental factors and that social, cultural, or normative factors may influence the use of facilities, a strong argument exists for promotion of accessible, low cost recreation facilities (Giles-Corti & Donovan, 2002a), and the creation of social environmental supports through policy. This may foster social capital by influencing the use of facilities and activity prevalence through social networks. These networks increase the flow of information between people (e.g. subsidized recreation programs and park locations). It may contribute to positively influencing norms of healthy behaviour and creating trusting environments and relationships that foster mutual respect and reciprocity. These ideas on social capital, and the research findings by Giles-Corti and Donovan (2002a), are reflected in participants' suggestions to

encourage physical activity for people of low income. These suggestions focus on increasing physical and financial access to programs, services, and parks.

Putnam (2000) identifies participation in recreational activities as a means to increase social capital and a need for policy and funding to support such activities. He argues for the creation of “powerful and enticing ways of increasing civic engagement” (p. 406) in ways that are appealing and fun. Perhaps physical activity is an excellent way to do so since numerous researchers have found that the most important aspects of behaviour choice were enjoyment and feeling good (Burton et al., 2003; Ritchie, Herscovitch, & Norfor, 1994).

*Anti-tobacco campaigns.*

Similar to the effectiveness of policy in tobacco control, policy interventions related to individual health behaviours such as physical activity focused on the larger social context and built environment have been shown to make a difference to promoting activity with a potential for increased activity at a population level (Emmons, 2000). For example, raising cigarette prices effectively discourages smoking (Anderson & Hughes, 2000; Warner, 2002), legislation for smoke-free environments conveys smoking as socially unacceptable (Anderson & Hughes, 2000), and the difficulty of quitting in social environment filled with smokers has also been confirmed (Siahpush, Borland, & Scollo, 2003). Whereas traditional anti-tobacco campaigns and smoking cessation interventions have targeted individual behaviour change, they have limited effectiveness unless they account for the individual as well as social contexts in which smoking behavior takes place (Siahpush et al., 2003). Research by Hammond, McDonald, Fong, Brown, and Cameron (2004) provides evidence that population based interventions such as smoke-free and cigarette labeling policies have a significant association with motivation to quit smoking and promoting continued abstinence.

Although little work has been done regarding policy innovations and health behaviours other than smoking, there is support for environmental changes to encourage physical activity (Emmons, 2000). For example it becomes easier to substitute a car or bus trip with walking or bicycling as modes of “*transportation*”, particularly for people of low income who bicycle because they “*have to get places*” [interview #7], when supportive features have been incorporated into the built environment, such as better systems of walkways, shorter distances, better landscaping (Frank et al., 2003) and land-use that improves community access (e.g. higher densities, greater connectivity, street design, land use mix) (Saelens et al., 2003). Van Lenthe, Brug, and Mackenbach (2005) studied the relationship between neighbourhood socioeconomic environment and physical inactivity and found that people living in the most disadvantaged neighbourhoods were more likely to walk or cycle to shops or work but less likely to be active in leisure time, due to poorer physical neighbourhood design and larger amounts of required police attention.

Public policy can support the adoption of healthier behaviours and creation of supportive environments, or safe, attractive and convenient places for physical activity. The proximity and density of places for physical activity within neighborhoods are associated with physical activity levels and environmental characteristics (e.g. lighting, weather, air pollution) have been shown to influence physical activity levels regardless of individual motivation and knowledge (Kahn et al., 2002). Policies and strategies that emphasize population wide physical activity have been shown to be related to better opportunities and infrastructure (e.g. existing facilities) for physical activity. More specifically, policy orientation influences the environment and individual behaviour, and has shown an association with high participation rates, perceived opportunities for being physically active

(e.g. awareness of programs), and high numbers of sports facilities (Ståhl, Rütten, Nutbeam, & Kannas, 2002). Thus, similar to targeting tobacco smoking behaviour, successful interventions focusing on the primary prevention of diabetes require a broad range of actions (i.e. different interventions, including those that address social, environmental and psychological factors that precede behaviour change) applied at multiple levels and a significant amount of effort expended on a long term basis in many social settings and involving multiple sectors (Auditor General of British Columbia, 2004).

### *Implications for Practice*

Physical activity has been identified as a modifiable risk factor for obesity and for the development of chronic diseases. People are aware of the benefits of physical activity and make active choices, thus the solution to increasing activity levels is not simply asking people to be more active, it is in making the active choice the easy choice through community design and policies, transportation systems, schools and workplaces (CFLRI, 2004). This is supported by suggestions from participants to shift workplace culture, work with schools and advertise programs and services and health messages to encourage physical activity for people of low income. Public opinion influences policy formation and implementation, therefore practitioners must consider extending their work (programs and research) not only to the public but to policy makers as well (Heymann, 2000). Also, given the complexity of factors that influence health behaviour, multiple and coordinated efforts are suggested for successful diabetes prevention programs (Auditor General of British Columbia, 2004).

In addition, “there can be no doubt that the socioeconomic position of individuals, groups, and places is a defining characteristic of their level of health and disease” (Lynch &

Kaplan, 2000, p. 29) and “chronic disease morbidity and mortality is disproportionately high among lower socioeconomic groups” (Emmons, 2000, p. 243). Socially disconnected individuals have a risk of dying from all causes that is between two and five times greater than those who have close ties with family, friends, and the community (Putnam, 2000). Patterns of physical activity are related to income, whereby the likelihood of engaging in leisure-time physical activity, in at least ten minute bouts, has been shown to increase with income (Schoenborn, Adams, Barnes, Vickerie, & Schiller, 2004). As this study found, based on the perspectives of this group of participants living with low income, fostering social capital provided a social environment that was supportive of physical activity and the effects of social capital contributed to positively influencing activity. For example, participants learned about community resources, received emotional support through understanding from others, and transportation assistance in order to participate in physical activities with others.. Therefore, practitioners could continue to create and support primary prevention programs and community based research with interventions or policy focused on capacity building and social change. In the SPDPP, barriers of expense, poor networks and inconvenient access were addressed (Burton et al., 2003) which positively influenced health behaviours, the dissemination of health information and health norms, access to services and amenities, and psychosocial processes.

A request exists for a ‘new’ public health focus which “emphasizes population-level interventions and a focus on upstream causes of health and well-being” with a trend toward health-promotion efforts targeting organizations and communities (Glass, 2000, p. 298). Sorensen and Stoddard (1998) argue for a broader notion of health promotion, moving from a focus on individual behaviour change to considering how environmental influences and

social contexts impact health. This conceptualization was seen thirty years ago with the Lalonde Report emphasizing the environment as an element of health promotion (MacDonald, 1998) and almost twenty years ago in the Epp Report and Ottawa Charter (WHO, 1986) outlining health promotion that involved creating supportive environments and encouraging reciprocal maintenance and care taking of each other, communities, and environments.

Furthermore, this study supports a suggestion by Burton et al. (2003) that efforts to increase physical activity at a population level should include “both general and socioeconomically targeted strategies” (p. 225). Further knowledge regarding factors influencing physical activity for people of different socioeconomic positions, particularly those of low income, can be used to “guide health efforts to conceptualize, measure, and target modifiable influences and ultimately reduce health inequalities” (p. 240). Collins, Lee, Albright, and King (2004) provide evidence to support community-based, culturally appropriate health education interventions for underserved groups that increase (or change) exercise-related knowledge, attitudes, and behaviors and develop social support for activity and facilitate the adoption and maintenance of physical activity. Although based on a small sample size, the present findings may contribute to guiding practice in the areas of health promotion, particularly the promotion of physical activity and building social capital, and inequality reduction (i.e. reducing socioeconomic differences in physical activity participation and ultimately health inequalities) with larger implications for impacting disease prevention.

### *Cost of Inactivity*

“Physical inactivity represents an important public health burden in Canada. Even modest reductions in inactivity levels could result in substantial cost savings” (Katzmarzyk et al., 2000, p. 1435). The annual cost of physical inactivity in British Columbia is estimated at \$422 billion (Colman & Walker, 2004). A 10% reduction in the rate of inactivity would equate to an estimated provincial saving of \$16.1 million every year. For every dollar invested in physical activity, there is an estimated long-term national saving of \$11 in health care costs (Donnelly & Coakley, 2002). Similar to Burton and colleagues’ (2003) findings on an individual level, expense is a significant barrier to activity for people of low income. The SPDPP ‘A Taste of Healthy Living’ programs provide a means of equitable access to services, programs and environments that encourage health promotion and disease prevention from an ecological perspective. As one participant stated, “*the little self esteem that I was given by comin’ to this program was worth a million dollars, it’s, it’s priceless. You know, it actually got me up doing things*” [interview #3].

### *Conclusion*

Future health promotion and disease prevention interventions that address as many levels as possible by incorporating the individual, community and governmental levels, may be most effective (Altman, 1995; Emmons, 2000). This is echoed by Rootman and Edwards (2004) who state that the future of physical activity promotion will be strongly influenced by an ecological approach, which incorporates theoretical perspectives of individual and environmental level factors, as the approach gains strength through further research.

Population health trends and variations in health outcomes are currently explained by compositional effects (i.e. people’s personal characteristics and individual differences) thus,

implying that policies should be directed towards people rather than environments (e.g. individually focused health education messages) (Macintyre & Ellaway, 2000). Kahn and colleagues (2002) argue that to affect entire populations, interventions must be directed toward physical and organizational structures rather than individuals. Therefore, we must further recognize that contexts or characteristics of the places where people live (i.e. features of the social or physical environment and/or their interaction with individual characteristics) may influence health in order to redirect policy and interventions at the environmental level (Macintyre & Ellaway, 2000). In addressing health issues, such as type 2 diabetes, the material context and conditions of everyday life must be considered (Ling Yu & Raphael, 2004), thus in accordance with Bandura (2004), “it is of limited value to motivate people to change if they are not provided with appropriate resources and environmental supports to realize those changes” (p. 151). We have a societal responsibility to provide resources and enable people to work together to improve health and broaden a perspective that focuses on individual level factors of health and disease to a “socially oriented agenda of research and practice” (p. 162).

Research on perceived environmental and policy determinants of physical activity revealed that neighborhood characteristics were positively associated with physical activity and strong support for health policy related measures (Brownson et al., 2001). Therefore, environmental and policy determinants should be incorporated into health and physical activity research and doing so may inform advances in physical activity interventions (Saelens et al., 2003). Policy approaches can create supportive environments and strengthen community action towards creating healthy physical and organizational environments (Kahn et al., 2002). Interventions that are implemented and evaluated over longer periods of time

and conducted by interdisciplinary teams of health and other professionals (urban planners, engineers), community agencies and organizations, legislators, and mass media can work to increase activity by changing policy, social networks, organizational norms, physical environments, facilities and laws (Kahn et al., 2002).

The purpose of this study was to examine factors that influence continued participation in physical activity and the relationship between these factors, based on the lived experiences of people of low income who had participated in a SPDPP program. This study identified factors influencing physical activity related to an ecological model (i.e. categorized by intrapersonal, interpersonal and environmental factors), and themes reflecting the barriers and facilitators to physical activity were best explained by the concept of social capital. In particular, participants described the significant role that trusting social relationships involving collaboration and supportive environments play in encouraging physical activity for this group of people of low income. The data were related to the components of social capital elucidated by Kawachi and Berkman (2000) as health behaviours, access to amenities, and psychosocial processes.

As we know, people of low income are at a greater risk of developing type 2 diabetes (Ling Yu & Raphael, 2004) and rates of type 2 diabetes are rising (CFLRI, 2004). This study, in its examination of means to support physical activity, contributes to our understanding of how to address this urgent health issue. As expressed by Ling Yu and Raphael (2004) it is of particular importance to consider how material conditions of everyday life influence the incidence of diabetes, and as examined in this study, to also consider physical activity within the context of daily life. Thus, the findings support practitioners and policy makers playing an integral role in encouraging physical activity through programs and services that foster

social capital and incorporate supportive social and physical environments. In particular, the results suggest that interventions address social contexts as being critical to targeting behaviour change in low income populations (Emmons, 2000). Apovian (2004) argues that addressing the worldwide obesity epidemic will require “not only behavioral changes at the individual levels but also changes in public policy, social environment, and cultural norms” (p. 979).

Given the need for the exploration of social and environmental variables and influences on health (Handy et al., 2002; Macintyre & Ellaway, 2000), this study contributes to further understanding the processes that shape health behaviours and interventions to improve health. Perceptions of social and community environments must be understood to develop appropriate indicators of social capital (Brennan et al., 2003) and this study provides information on physical activity (e.g. definitions of activity, factors influencing activity, suggestions to support activity) based on the lived experiences of people of low income from a qualitative perspective. Thus, this study broadens our grasp of the subject beyond what is known based on theoretical or deductive approaches of behaviour change and offers insights into the development of relevant interventions to support physical activity for this population. Furthermore, findings contribute to an enhanced understanding of the importance of social capital to people of low income, arguing for further interventions and policy relating to social capital and health inequality (Ziersch et al., 2005).

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## Appendices

## Appendix A. Findings of Studies Examining Variables of the Built Environment and Effects on Physical Activity

Table A1.  
Findings of Studies Examining Variables of the Built Environment and Effects on Physical Activity.

Reference	Number/ nationality	Setting	Methods	Significant findings
Humpel et al. (2004)	Australian adults N=399	coastal city (population 180,000); 43% response rate	Cross-sectional mail out survey; types of walking: neighbourhood, exercise, pleasure, to get to places; environmental attributes: aesthetics, accessibility, safety, weather	Environmental attributes associated with different types of walking; men with positive perceptions of neighbourhood aesthetics in highest category of neighbourhood walking; men who perceived weather not inhibiting were high exercise walkers; women who perceived weather not inhibiting were high neighbourhood walkers; women with moderate perceptions of accessibility more likely to walk for pleasure
DeBourdeaudhuij et al. (2003)	Belgian adults N=521	Random sample; 52.1% response rate	Cross-sectional analyses of self-reported survey	Environmental variables related to all types of PA in both sexes; walking duration & moderate activity related to quality of sidewalks and accessibility of shopping & public transport; vigorous PA related to presence of activity supplies at home and # of convenient facilities
Ewing et al. (2003)	US adults N=206,992 from BRFSS	US counties (448) & metropolitan areas (83)	Sprawl indices; self-reported behaviour and health status	Residents of sprawling counties walked less during leisure time, weighted more and greater prevalence of hypertension.
Giles-Corti & Donovan (2003)	Australian adults N=1,803	healthy workers & homemakers in metropolitan Perth	Cross-sectional telephone survey	Most respondents walked for transport or recreation; only 17.2% walked enough to accrue health benefit; individual, social environmental and physical environmental factors almost equally important
Huston et al. (2003)	US adults N=1,796	US counties (6) in North Carolina	Cross-sectional telephone survey	Neighborhood characteristics (trails, streetlights, access to places for PA) positively associated with leisure-time PA levels.
King et al. (2003)	US older, Caucasian women N=149	Community in Pennsylvania	Cross-sectional analysis of data from 1999	Living within 20 min-walk of home of a park, biking or walking trail or store related to higher pedometer readings; positive trend between sum of destinations within walking distance of home & activity levels; positive trend between neighbourhood 'walkability' rating & activity levels

Powell et al. (2003)	US adults N=4,532	Georgia Behavioural Risk Factor Surveillance System	Telephone survey	Neighborhood streets, sidewalks & public parks most commonly reported safe and convenient places for walking; direct relationship between convenience of walking place & meeting PA recommendations
Saelens, Sallis, Black, & Chen (2003)	US adults N=107	neighborhoods (2) in San Diego, California	Neighborhood environment survey; self-report & accelerometer	High-walkability neighborhood residents reported higher residential density, land use mix, street connectivity, aesthetics & safety & 70 more min. PA and lower obesity rates than residents of low-walkability neighborhoods
Salmon et al. (2003)	Australian adults N=1,332	Australia	Cross-sectional mail survey	Respondents reporting high enjoyment & preference for PA more likely to report high levels of PA; those reporting cost, weather & personal barriers to PA were less likely to be physically active
Berrigan et al. (2002)	US adults N=17,030	Data National Health & Nutrition Examination Survey	Logistic regression & 95% confidence intervals	Adults living in homes built before 1946 and from 1946-73 significantly more likely to walk 1+ miles $\geq$ 20x/mo than those in homes built after 1973. Present in urban and suburban counties, not in rural counties.
Craig et al. (2002)	27 CDN neighborhood observations & 1996 census	Canada	Hierarchical linear modeling; 18 neighbourhood characteristics	All neighbourhood characteristics, except visual interest & aesthetics contributed significantly to environment score; score positively associated with walking to work, with and without adjustment for degree of urbanization.
Brownson et al. (2001)	US adults; oversampled people of low income	United States	Cross-sectional study; telephone survey developed from BRFSS & other surveys	Availability of areas for PA higher for men than women; neighborhood characteristics positively associated with PA (sidewalks, scenery, heavy traffic, hills); high level of support for health policy-related measures; 1/3 of those who used environmental supports reported $\uparrow$ in PA
Sallis et al. (1997)	110 university students	San Diego, California	Questionnaire; self-report	Home equipment & convenient facilities correlated with PA; significant association between home equipment and strength exercise

US = American

CDN = Canadian

PA = physical activity

BRFSS = Behavioral Risk Factor Surveillance System

$\uparrow$  = increase

## Appendix B. Saanich Peninsula Diabetes Prevention Project Information Sheet

***PUBLIC RECREATION AND THE PRIMARY PREVENTION OF TYPE 2  
DIABETES ON THE SAANICH PENINSULA***

**WHAT'S THIS PROJECT ABOUT?**

The purpose of this participatory action research project is to understand and document how public recreation programs and services can make a difference in preventing **Type 2 Diabetes** (diabetes that is closely linked to certain lifestyle and social conditions) in those individuals who may be at risk of developing the disease.

**WHO MIGHT BE "AT-RISK"?**

Low income individuals, seniors, First Nations peoples, people living with disabilities and those of Hispanic, Asian or African descent are considered at greater risk than others. Individual risk factors include, among others, being overweight and physically inactive.

**WHO'S INVOLVED?**

The project is funded by Health Canada as part of the Canadian Diabetes Strategy. Project partners include: University of Victoria, School of Physical Education, Panorama Recreation Centre, Peninsula Community Services, the Aboriginal Sport Development Centre, Vancouver Island Health Authority, the Canadian Diabetes Association and others.

**WHAT WILL THE PROJECT DO?**

This project takes a community-based approach to diabetes prevention rather than a clinical one. Through informal focus group discussions, Saanich Peninsula community members, and in particular, those who are most at-risk for developing the disease, will be involved in identifying community needs as well as barriers which inhibit involvement in existing community programs and services. Some will participate in work groups which will develop strategies, new programs, and services shaped to the needs of those at-risk.

**HOW WILL THE PROJECT BENEFIT THE COMMUNITY?**

The project will identify and document the contribution of public recreation programs and services as an effective approach to the understanding and prevention or delay of Type 2 Diabetes. By the end of the project we hope to identify and address (where possible) barriers that may prevent at-risk populations from participating in recreation programs that may help to prevent Type 2 Diabetes. We also anticipate that the project will assist in building capacity for the community and its local agencies to sustain identified strategies, programs and services significant to the prevention of Type 2 Diabetes. In short, we anticipate that the project will help us to understand how we can make the community a healthier place to live for those at-risk for Type 2 Diabetes.

**HOW CAN I GET INVOLVED?**

If you consider yourself or a family member at risk for the development of Type 2 Diabetes, or if you feel you have something to contribute to this project and want to get involved, please contact us.

**FOR FURTHER INFORMATION or TO PARTICIPATE:**

Please contact Trina Rickert, Project Coordinator, at 656-0007 ext. 239.

### Appendix C. Saanich Peninsula Healthy Living Program

Due to life circumstances that create disadvantages, there are many people on the Saanich Peninsula that live without the resources to eat a healthy diet, engage in regular physical activity, or participate in community programs and services, putting them at greater risk for developing type 2 diabetes. Similarly, people living with disabilities or who have a family history of type 2 diabetes may be at greater risk of developing type 2 diabetes. The Saanich Peninsula Diabetes Prevention Project recognizes that individual decisions around health behaviors and lifestyle are complex, and influenced by many factors where citizens live, work and raise a family. This program has been designed to address active living, healthy eating, and social inclusion in a “support-group” format, tailored to the interests and needs (financial, transportation, health, location) of participants. Programs aim to reduce the barriers to participation by offering transportation, access to experts (dietitians, nurses, fitness leaders), and resources (journals, t-shirts, water bottles and pedometers) at no cost. Included in the four to eight-week ‘A Taste of Healthy Living’ program are activities such as:

- a tour of the Canadian Diabetes Association office, library, and store;
- educational sessions and cooking class with a nutritionist;
- blood glucose testing and education with a community health nurse;
- an orientation to Panorama Recreation Centre weight room, facility tour and introduction to L.I.F.E. program (‘Leisure Involvement for Everyone’ – a recreation subsidy program open to citizens with low incomes at all recreation centres in the region);
- hike with a naturalist

- Thrifty's grocery store tour with a nutritionist;
- a walk around Elk/Beaver Lake;
- P.A.C.E. (Physical Activity through Chair Exercises), yoga, tai chi and Swiss ball classes at Panorama;
- education and participation in goal setting, healthy eating, active living and feeling good about yourself (Vitality Message);
- discussion about and introduction to community resources (e.g. Food Bank, Good Food Box program, computer services at library, free lunches at local churches).

#### Appendix D. SPDPP and Community Based Participatory Research

Community-based participatory research (CBPR) is a collaborative research approach that involves community members as well as academic researchers throughout the research process, thus it is “research *with*, rather than *on* communities.” (Leung et al., 2004, p. 500). In echoing this, the SPDPP focused on “health promotion and disease prevention *with and for* the public rather than *on* the public” (p. 504). Researchers and community members work together to define the problem, integrate their knowledge, and focus on social change to improve the community’s health and eliminate health disparities while building on the strengths and resources within the community to improve their abilities to work together to improve health (Israel et al., 2003). A participatory approach requires “community and individual participation in planning, organization, operation, evaluation, and control” (Hills et al., 2001, p. 15); it is a collaborative process (Leung et al., 2004) that provides “resources to enable community members to fully participate”, and “fosters empowerment as a means of communities taking responsibility for their role in achieving health of their members” (Hills et al., 2001, p. 15). It involves disrupting the status quo and it strives for greater equality (Thomas & Nelson, 2001). The SPDPP upholds and integrates varying degrees of the CBPR principles outlined by Israel et al. (2003) (see Table 4).

It is important to note that CBPR does not hold the same meaning across contexts and there are many models or versions, which have been explained on a continuum with varying degrees of participation and involvement of researchers and participants (Naylor, Wharf Higgins, Blair, Green, & O’Connor, 2002; Petras & Porpora, 1993). CBPR principles occur on a continuum and vary depending on the context and participants involved (Israel et al., 2003). CBPR reflects the contexts, needs/issues, structure, resources and constraints of the

present reality and community it is involved with (Greenwood, Whyte, & Harkavy, 1993; Smith, 1997). Thus, CBPR is always changing, occurs on a continuum, and it is an emergent process; it is not a method, but an orientation to research (Leung et al., 2004) and these ideas are strongly evident in the SPDPP.

The project meets the definition of CBPR as a process of collaborative investigation, education and action to support those with less power in community settings (Hall, 2001; Tau Lee, Krause, & Goetchius, 2003). Specifically, community members work together to increase the awareness of diabetes prevention and create accessible opportunities for physical activity, as evidenced in the creation of 'A Taste of Healthy Living' programs. CBPR involves a full and active participation of the community and a range of marginalized populations (Hall, 2001). Stakeholders' involvement, organizational goals, mandates, clients and activities are different (Israel et al., 2003), as seen in the SPDPP whereby all project opportunities may not be of interest or applicable to each partner, thus having a full, active community participation and decision making may actually mean involving various partners at different stages of the research process. The project works with various populations at risk for type 2 diabetes, including isolated seniors, people of low income and first nations people. It also upholds the principle of equitable partnerships in that the community and project's partners have primary control of the project's decision-making. The project's funds are also allotted to programs which can be integrated within community organizations and the project aims to increase community capacity within community members and organizations to support healthy living behaviours.

Participation is a process that must be generated over time (Greenwood et al., 1993), which links to the principle of CBPR being a long-term process and commitment. The

project has been repeatedly faced with the challenge of either maintaining a community-based approach or meeting the priorities and timelines of a more traditional funding/researcher driven agenda. The project has nurtured partnerships and respected the community's own pace of work . It has promoted the ideal of collective collaboration and recognized the capacity and right of individuals to make their own decisions (Zakus & Lysack, 1998), thus, adhering to CBPR principles.

Table C1.

*Application of the SPDPP to Community-Based Participatory Research Principles.*

CBPR Principles <sup>1</sup>	Explanation	Examples in the SPDPP
Community as a unit of identity	research occurs in the context of a 'community' which can be defined as a geographical area, school, workplace, etc.	research was bound to the Saanich Peninsula and occurred primarily in social service agencies, a recreation centre and First Nations schools
Builds on community strengths and resources	focus on community empowerment and building on the strengths and resources of the community and researchers	expanded social connections and partnerships; fostered trusting relationships and increased awareness of existing community resources and services
Facilitates collaborative, equitable partnerships in all phases of research	empowerment and power sharing involves building trust and forming collaborative; equitable community involvement throughout all stages of research process (i.e. identifying the problem, data collection, interpretation and dissemination and application of the results)	created citizen advisory group and facilitated regular meetings with partner organizations; worked at the community's pace
Promotes co-learning and capacity building among partners	sharing of knowledge/skills, power and co-learning	promoted sharing of knowledge and skills through meetings, programs and newsletter; researchers and participants were equal learners in the project
Integrates a balance between research and action for benefits of all partners	balancing research and action with an intention of the research process producing social change and health improvement so that all parties benefit	positive findings indicated by process and outcome evaluations (e.g. increased knowledge of services provided by other organizations, increased adoption and adherence to exercise and utilization of local programs supporting healthy eating and active living)

Emphasizes local relevance of health problems and ecological perspectives that recognize multiple determinants of health	research within real-life settings and priorities; conducting research on needs that are relevant to the community; consideration of multiple determinants of health and the larger context within which people (i.e. the community) are embedded (e.g. social, economic, organizational circumstances)	need for diabetes prevention and promotion of physical activity among people at risk for type 2 diabetes was identified by recreation center administrator who contacted university faculty and developed further community partnerships; project adopted a population health approach; programs addressed multiple barriers to participating
Involves systems development through cyclical and iterative process	partnerships act as systems to develop competencies in community members in order to engage in a research process	partnership development; ongoing evaluation of the project; findings used in planning; collective decision making; establishment of mechanisms for sustainability
Disseminates findings and knowledge gained to all partners and partners are involved in dissemination process	self-explanatory	methods: co-presenters at meetings and conferences, co-authoring articles, meetings, reports in language that is understandable and respectable; use of results to inform action
Involves long term-process and commitment (beyond research process or funding period)	self-explanatory	further funding achieved for year four; commitment from partners to maintain relationships and collaborations between organizations

<sup>1</sup> based on principles outlined by Israel et al. (2003). Critical issues in developing and following community based participatory research principles. In M. Minkler & N. Wallerstein (Eds.), *Community based participatory research for health* (pp. 53-76). San Francisco: Jossey-Bass.

## Appendix E. Participant Letter of Invitation



Faculty of Education, School of Physical Education  
P.O. Box 3015 STN CSC  
Victoria, BC V8W 3P1  
Tel. 721-8373

February XX, 2004

Dear

I would like to invite you to participate in a study on “Exploring the Factors Associated with Sustaining Physical Activity in Individuals At-Risk for Type 2 Diabetes.” This study is being conducted in partial fulfillment of my requirements for a Masters of Arts degree at the University of Victoria.

This study is examining individual, social and environmental factors that influence continued participation in physical activity for people living with low incomes, a population that is considered at risk for type 2 diabetes. You have been invited to participate because you have completed a healthy living program with the Saanich Peninsula Diabetes Prevention Project. The benefits of being involved include furthering your understanding of factors that influence participation in physical activity and contributing to further societal knowledge of factors that influence active lifestyles and population needs which could lead to improvements in recreation and health programs and policies to better support physical activity and chronic disease prevention.

Your participation would involve one 60 minute individual interview and one 30 to 60 minute group community mapping exercise (drawing pictures or symbols that represent every day experiences and describing how different factors influence physical activity with about four other people). As a way to compensate you for any inconvenience related to your participation in the research study, you will be given a \$20 honorarium. It is important for you to know that it is unethical to provide undue compensation or inducements to research participants and, if you agree to be a participant in this study, this form of compensation to you must not be coercive. If you would not otherwise choose to participate if the compensation was not offered, then you should decline. If you have transportation or child care costs while you are participating in the study, these will be covered.

You are being asked to participate in this study because you have completed a healthy living program with the Saanich Peninsula Diabetes Prevention Project (SPDPP) for persons living with low incomes. The researcher is also the project coordinator of the SPDPP, and although she has minimal contact with program participants, to minimize any feelings that you may have about being coerced to participate in the study a staff member from Peninsula Community Services first contacted you about your potential involvement. It is important for you to know that your participation is entirely voluntary and it will not affect your past,

present or future participation in the SPDPP or your status as a client of Peninsula Community Services in anyway.

If you choose to be involved your identity will be protected and all information will remain confidential. Your name will not be attached to any documents and code names will be used. The interview will be anonymous although the community map is a group activity where you will see and hear what others contribute, so we will ask you not to repeat what others say, write or draw after the session is over. You should also know that other participants will see and hear your contributions to the community map, so we cannot guarantee complete anonymity for this part of the study. All documents, tape recordings and electronic files will be stored in a locked filing cabinet to protect your confidentiality. You may withdraw from the study at any time without any consequences or explanation. Upon completion of your involvement, if you would like, a report of the results will be provided to you.

If you would like to participate in this study, please contact me at 382-1743 (home) or 656-0007 x. 239 (work) or via email at [trickert@uvic.ca](mailto:trickert@uvic.ca).

Sincerely,

Trina Rickert  
Graduate Student

## Appendix F. Interview Questions

Participants were introduced to the purposes and objectives of the research study, the consent form and ways in which their anonymity and confidentiality would be protected. The potential risks and benefits of their participation were explained, as well as the protocol involved with the interview process and how the data would be used.

### *Opening comment:*

Thank you for participating in this study. Given that you participated in a Saanich Peninsula Diabetes Prevention Project healthy living program, which involved learning about community resources, nutrition and physical activity. Let's talk about the physical activity side of things and your experiences with physical activity. I am not looking for particular answers (i.e. whether you do or do not do physical activity is fine) and I am interested in learning about your experience.

1. Tell me a little about yourself and your life (*opening/rapport building questions*)
  - a. Age
  - b. Family
  - c. Interests
  - d. Health issues
  - e. How do you define physical activity?
  - f. When did you first start the healthy living program?
  - g. Were you active before the program?
  - h. Are you trying to be active now?
2. Can you tell me about your experience with the SPDPP healthy living program? For example, what was most memorable? most enjoyable? least enjoyable?
3. What was your social experience like in the program?
4. How did you feel in the social situation of the program?
5. How does a person of low income's social circumstances relate to personal, interpersonal and community factors?
6. What connections do you see between these factors? (or how do you see these factors interconnecting?)
7. You've tried a healthy behavior change, let's talk about the physical activity side of things. What does physical activity mean to you? What does participating in physical activity feel like to you?
8. In your view, what factors influenced (or would have influenced) your continuation in physical activity following the program?
9. What makes doing physical activity easy? Did anything help you to be active? If so, what?

10. Do your family and friends affect or influence your physical activity choices? If so, how?
11. How would you know that something supports your decision to be active?
12. What makes doing physical activity challenging? Or what got in the way of doing activity? Or in your view, what factors would not support your continuation in physical activity?
13. How would you compare your physical activity level following the SPDPP program to your level before the program?
14. Where are you at now with continuing physical activity?
15. What about your life at the
  - a) personal level influenced the experience of doing physical activity? (i.e. individual characteristics, knowledge, skills, attitude)
  - b) interpersonal level influenced this experience? (i.e. social network, friends, family)
  - c) community level influenced this experience? (i.e. institutions, relationships among organizations, informal networks, environmental influences, laws and policies)
16. Some people believe there are factors in the environment and community which encourage or discourage physical activity, what do you think?
17. What can be done on the Saanich Peninsula do to support or encourage physical activity for people of low income?
18. What advice would you give to professionals and policy makers on what can be changed in communities to encourage physical activity for people of low income?

### **Prompting Questions**

1. Can you elaborate on...
2. Can you explain.... (or Can you describe this situation some more?)
3. Do you have a specific example of this?
4. Is there another situation similar to that?
5. Is there anything else you would like to add that you haven't already mentioned?

## Appendix G. Interview Documentation Sheet

Date of the interview:

Place of the interview:

Duration of the interview:

Identifier for the participant:

Gender of the participant:

Age of the participant:

Profession of the participant or previous profession (if applicable):

Date participant completed SPDPP:

Peculiarities of the interview:

## Appendix H. Community Self-Portrait Guidelines

A community self-portrait is used to describe “how we look” as individuals and as a community to identify critical issues (Marino, 1997) concerning physical activity.

In order to describe the community, the group will be asked to draw pictures or symbols, as detailed as possible and by looking for differences between the pictures, to identify answers to the following questions/prompts:

1. Discuss and draw different ways in which the community sees itself (for example draw images for the following categories: map of town, neighborhood, institutions – religious, educational, political; market; kinds of work, places of work; ecology; daily activities of men, women and children; types of people and social aspects).
2. Draw and describe every day experiences, particularly focusing on physical activity. It may help to think of the answers to the following questions:
  - Where do you live?
  - What physical activity do you do?
  - Where do you do activity?
  - Who do you do it with?
  - What makes doing physical activity easy?
  - What makes it challenging?
  - What about the community would you change to make physical activity more accessible?
3. Draw relationships and systems by making diagrams or rearranging the pictures to show connections between the drawings (i.e. that show political, economic, educational and ecological connections by using symbols or pictures of local community landmarks, such as: city hall, government buildings, factories, workplaces, stores, restaurants, schools, churches, rivers and streets).
4. Explain and/or draw why and how specific problems exist.

## Appendix I. Informed Consent Form

***Participant Consent Form***

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**Exploring the Factors Associated with Sustaining Physical Activity in Individuals At-Risk for Type 2 Diabetes**

You are being invited to participate in a study entitled “Factors Which Influence Continued Involvement in Physical Activity for Individuals at Risk for Type 2 Diabetes” that is being conducted by Trina Rickert. Trina is a graduate student in the department of Physical Education at the University of Victoria and you may contact her if you have further questions by phoning 382-1743 or emailing [trickert@uvic.ca](mailto:trickert@uvic.ca).

As a graduate student, I am required to conduct research as part of the requirements for a masters of arts degree. It is being conducted under the supervision of Dr. Joan Wharf Higgins. You may contact my supervisor at 721-8377 and [jwharfhi@uvic.ca](mailto:jwharfhi@uvic.ca).

The purpose of this research project is to examine the inter-relationships between factors that influence physical active lifestyles among persons living with low incomes. Research of this type is important because type 2 diabetes is the 7<sup>th</sup> leading cause of death in Canada and the economic burden of diabetes was estimated at \$1.6 billion annually in 1998. This study will identify and provide information on individual, social and environmental factors affecting participation in physical activity in individuals who are of populations living with low incomes, as they may be at risk of type 2 diabetes.

You are being asked to participate in this study because you have completed a healthy living program with the Saanich Peninsula Diabetes Prevention Project (SPDPP) for persons living with low incomes. The researcher is also the project coordinator of the SPDPP, and although she has minimal contact with program participants, to minimize any feelings that you may have about being coerced to participate in the study a staff member from Peninsula Community Services first contacted you about your potential involvement. It is important for you to know that your participation is entirely voluntary and it will not affect your past, present or future participation in the SPDPP or your status as a client of Peninsula Community Services in anyway.

If you agree to voluntarily participate in this research, your participation will include: (1) participation in one audio taped interviews (approx. one hour in duration); (2) create a community self-portrait (drawing pictures or symbols that represent every day experiences and describing how different factors influence physical activity) with about four other people who have also completed a healthy living program with the SPDPP (approx. 30 to 60 minutes in duration and this activity will be audio-taped).

Participation in this study may cause some inconvenience to you, including your time to participate in the interview and mapping exercise. It may be possible during the interviews that you may feel sad or distressed as you reflect on your life and efforts to integrate physical activity. Should this occur, you will be referred to a physical activity counselor/professional

at Panorama Recreation Centre to help you address any emotional concerns related to active living.

The potential benefits of your participation in this research include: identifying environmental supports and barriers for physical activity, monitoring of personal activity levels for personal benefit and potential motivation, and contributing to further knowledge in the health promotion field and to the researcher's learning and further education.

As a way to compensate you for any inconvenience related to your participation in the research study, you will be given a \$20 honorarium. If you have transportation or child care costs while you are participating in the study, these will be covered. It is unethical to provide undue compensation or incentive to participants and, if you agree to be a participant in this study, this form of compensation must not be coercive. If you would not otherwise choose to participate if the compensation was not offered, then you should decline.

If you decide to participate, you may withdraw at any time without any consequences or any explanation. If you withdraw from the study you will be contacted to determine whether or not you approve of your existing records (i.e. interview and/or transcripts) being used in the analysis of data. If you do not approve or if I am unable to contact you after three attempts (by telephone and mail), records will be destroyed and your information will not be used in the data analysis. If you withdraw from the study after taking part in the community portrait/mapping exercise, it will not be possible to remove your data on the community mapping portion of the study.

In order to assure myself that you are continuing to give your consent to participate in this research, I will ensure that the study has been explained to you and you will be given the opportunity to ask questions about and discuss the study with myself and/or my supervisor at any time throughout the study. A signed copy of this consent form will be kept on file.

To maintain your anonymity your name will not be attached to any documents and only code names will be used. Access to the code-named data will be limited to the researcher. The community map is a group activity where you will see and hear what others contribute, so we will ask you not to repeat what others say, write or draw after the session is over. Other participants will see and hear your contributions to the community map, so we cannot guarantee complete anonymity for this part of the study. Your confidentiality and the confidentiality of the data will be protected by ensuring that all notes, transcriptions, maps, tape recordings and electronic files will be kept in a locked filing cabinet for three years. Then all data from this study will be disposed of via paper shredder and audio tapes and electronic files will be destroyed.

Other planned uses of these data include analysis and interpretation relating to environmental factors supporting or acting as barriers to physical activity and comparison between individuals within a population that is at risk for type 2 diabetes. It is anticipated that the results of this study will be shared with others through a written document for all participants, in a thesis presentation and in a published article or conference presentation.

In addition to being able to contact the researcher and the supervisor at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (472-4362).

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

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*Name of Participant*

*Signature*

*Date*

*A copy of this consent will be left with you, and a copy will be taken by the researcher.*