

**A COMPARATIVE STUDY OF BARRIERS AND MOTIVATORS
TO PHYSICAL ACTIVITY AMONG EAST ASIAN AND
CAUCASIAN OLDER ADULTS**

by

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Abstract

This quantitative, exploratory study investigated potential differences between East Asian and Caucasian older adults in perceived motivators and barriers to attending exercise classes compared to those who do not attend. A total of 169 participants aged 50 and older were recruited into the study. Bivariate analyses showed statistically significant differences between ethnic groups for most barrier, motivator, and other exercise related variables. The barrier most strongly associated with ethnicity is bad weather, with East Asians more likely to report this than Caucasians. The motivator variable most strongly associated with ethnicity is increased muscle strength, which was reported more frequently by Caucasians than East Asians. Multivariate analyses revealed a persistent effect of ethnicity on the frequency of reporting barriers and motivators even after controlling for demographic, physical health, and activity limitation variables. Findings are discussed in terms of activity program recommendations targeting ethnic minority older adults.

Keywords: Older adults, exercise, physical activity, cultural differences, East Asian, Caucasian, exercise classes, seniors' centres

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Table of Contents

Approval Page.....	ii
Abstract.....	iii
Acknowledgements.....	iv
Table of Contents.....	vi
List of Figures.....	viii
List of Tables.....	ix
Chapter 1: Introduction.....	1
Rates of Physical Activity in Older Adults.....	4
Differences in Older Adults’ Physical Activity Levels Across Ethnic Groups.....	6
Benefits and Importance of Physical Activity in Later Life.....	7
Investigating Relationships between Ethnic Background and Physical Activity.....	10
What is ethnic background?.....	10
Why study physical activity and ethnic background?.....	11
Theoretical Perspectives.....	13
Social-ecological perspective.....	13
Health belief model.....	17
Social cognitive theory.....	20
Interdisciplinary model of culture and physical activity.....	24
Research Questions.....	27
Chapter 2: Literature Review.....	29
Barriers to Physical Activity.....	32
Cross-cultural person-based barriers.....	32
Cross-cultural program-based barriers.....	33
Culturally specific person-based barriers.....	35
Culturally specific program-based barriers.....	36
Motivators and Facilitators for Physical Activity.....	38
Cross-cultural person-based motivators.....	38
Cross-cultural program-based motivators.....	40
Culturally specific person-based motivators.....	41
Culturally specific program-based motivators.....	41
Cultural versus individual differences.....	41
Chapter 3: Study Methods.....	42
Design.....	42
Sampling and Recruitment.....	42
Measures.....	44
Data Analysis.....	47
Recoding missing data.....	47
Computed variables.....	48

Chapter 4: Results	50
Descriptive Statistics.....	50
Basic demographic variables.....	50
Health and activity variables.....	51
Exercise class variables.....	53
Barriers to attending exercise classes.....	58
Benefits of attending exercise classes.....	59
Cultural variables.....	60
Demographic variables.....	61
Bivariate Analyses.....	62
Multivariate Analyses.....	66
Chapter 5: Discussion	81
Research Question 1.....	81
Research Question 2.....	84
Research Question 3.....	86
Supplemental Research Points.....	86
Exercise-related self-efficacy.....	86
Outcome-expectancy values.....	86
Preference for cultural homogeneity.....	88
Analytical Typology.....	88
Links to Theoretical Perspectives.....	90
Recommendations for Physical Activity Programs.....	95
Logistic Challenges.....	97
Limitations.....	99
Future Research.....	101
Chapter 6: Conclusion	104
References	106
Appendices	115
Appendix A: Cultural differences in perceived motivators and barriers to physical activity (literature review).....	115
Appendix B: Detailed bivariate results.....	120
Appendix C: Survey for exercise class attendees.....	142
Appendix D: Survey for non-exercise class participants.....	147
Appendix E: Informed consent form.....	152
Appendix F: Study information letter.....	154
Appendix G: Chinese translation of survey for exercise class attendees.....	156
Appendix H: Chinese translation of survey for non-exercise class participants.....	161
Appendix I: Chinese translation of informed consent form.....	166

List of Figures

Figure 1:	Leisure-time physical activity levels by age and gender, Canada, 2008.....	5
Figure 2:	Interdisciplinary model of culture and physical activity.....	25
Figure 3:	Barrier and motivator survey variables and the interdisciplinary model of culture and physical activity.....	94

List of Tables

Table 1:	Research questions	28
Table 2:	Interactions between cultural and perceived predictors of PA: A framework	30
Table 3:	Types of physical activity engaged in outside exercise classes.....	52
Table 4:	Types of exercise classes non-class participants would like to attend.....	53
Table 5:	Perceived importance and likelihood of exercise class outcomes for non-class participants	54
Table 6:	Mean outcome-expectancy values (OEV) for non-class participants	55
Table 7:	Types of exercise classes attended by class participants.....	56
Table 8:	Perceived importance and likelihood of exercise class outcomes for class participants	57
Table 9:	Mean outcome-expectancy values (OEV) for class participants	58
Table 10:	Barriers selected by participants.....	59
Table 11:	Benefits selected by participants	60
Table 12:	Cultural variables split by ethnic group	60
Table 13:	Summary of demographic and descriptive results	62
Table 14:	Summary of statistically significant bivariate results	66
Table 15:	Logistic regression results – all participants; total physical activity DV.....	69
Table 16:	Logistic regression results – class participants; frequency of exercise class attendance DV.....	70
Table 17:	Logistic regression results – all participants; barrier DV	71
Table 18:	Logistic regression results – class participants; barrier DV.....	72
Table 19:	Logistic regression results – all participants; benefit DV	73
Table 20:	Summary of statistically significant multivariate results.....	79
Table 21:	Analytical typology and descriptive results.....	90

Chapter 1: Introduction

Physical inactivity is a major risk factor for chronic disease (King, Castro, Wilcox, Eyler, Sallis, & Brownson, 2000). Regular physical activity prevents, delays, and can even reverse the onset of numerous chronic conditions as well as mental health diagnoses such as depression (Umstattd & Hallam, 2007) – issues of particular concern for older adults, who have higher rates of chronic diseases than any other age group. The Seniors' Healthy Living Secretariat, a branch of the BC Government's Ministry of Healthy Living and Sport, identifies promoting healthy living among older adults as one of its foundational "cornerstones". The central goal of this cornerstone is to increase physical activity among adults aged 50 and older, given that approximately 50% of these individuals do not meet minimum recommended levels of physical activity. The Secretariat recognizes physical activity (PA) as essential in supporting longevity, quality of life, and independence; reducing the risk of diseases and chronic conditions; and minimizing or delaying seniors' health care costs (Ministry of Healthy Living and Sport, n.d.). As the population of older adults in Canada and elsewhere continues to grow, these issues will increase in significance in the health, fitness, and leisure sectors.

In 2006, 13% of Canadians were aged 65 and older. Population projections show that by 2015, the proportion of older adults may exceed the proportion of children aged 15 and under – currently 17% of the population. This would be a historic first. By the middle of the twenty-first century, the proportion of older adults could reach double that of children (Statistics Canada, 2008).

Older populations generally are less active than younger cohorts, with ethnic minority groups typically engaging in less PA than the majority culture (Lim, Waters, Froelicher, & Kayser-Jones, 2008). Increasing physical activity among older adults, especially those exhibiting low activity levels, is a significant health goal that would lead to a multitude of health benefits for these populations. The current study investigates perceived motivators and barriers of physical activity among culturally diverse older adults with a focus on structured, instructor-led physical activity programs or classes. Health and fitness professionals could use results and recommendations stemming from the study to create PA and health promotion programs tailored to specific ethnic groups, or to more effectively target multicultural groups of older adults.

A relatively large proportion of Canadian seniors are immigrants, and British Columbia has a higher proportion of immigrant older adults compared to most other provinces. In 2001, 28.6% of adults aged 65 to 74 and 28% of those aged 75 to 84 were immigrants. In comparison, 21.3% of Canadians aged 25 to 54 were immigrants. More than half (55%) of immigrant older adults arrived in Canada before the age of 34, and thus have been living in the country for more than three decades. In British Columbia, 39% of seniors are immigrants – the second-highest proportion in Canada after Ontario. Following Toronto, Vancouver has the second-highest proportion of immigrant seniors of any Canadian city (Turcotte & Schellenberg, 2007). The proportion of immigrants in Canada has been increasing for decades, and will continue to do so. By 2017, population projections predict that one Canadian in five could be a member of a

visible minority group (compared to 13% in 2001). This proportion is higher for large cities such as Toronto and Vancouver: Between 47% and 53% of Vancouver's population may be comprised of visible minorities by 2017. This figure was 36% in 2001. South Asians (countries of the Indian subcontinent) and Chinese are and will remain the largest visible minority groups in Canada (Bélanger & Malenfant, 2005). These population changes call for increased research attention to factors influencing the health of ethnic minority groups. This study is timely in that it contributes to the relatively small body of research on Canadian ethnic minority older adults' PA behaviours, focusing on one of the two most prevalent minority cultural groups in Canada – East Asians. For the purposes of this study, East Asia includes China, Hong Kong, Korea, Japan, and Taiwan.

The distinction between physical activity and exercise has long been made in the health promotion research field. Physical activity is defined as “any bodily movement produced by skeletal muscles that results in energy expenditure” (Caspersen, Powell, & Christenson, 1985, p. 126). Physical activity in daily life can be classified into types: occupational, sports, conditioning, household, and other activities. Exercise is a subset of PA that is planned, structured, and repetitive. It is purposive in that the objective is to improve or maintain one or more aspects of physical fitness (Caspersen, Powell, & Christenson, 1985). Leisure-time physical activity (LTPA) is a more specific subset of PA that is often used in research, defined as “exercise performed during free time for at least 20 minutes without stopping that is strenuous enough to make the heart rate and

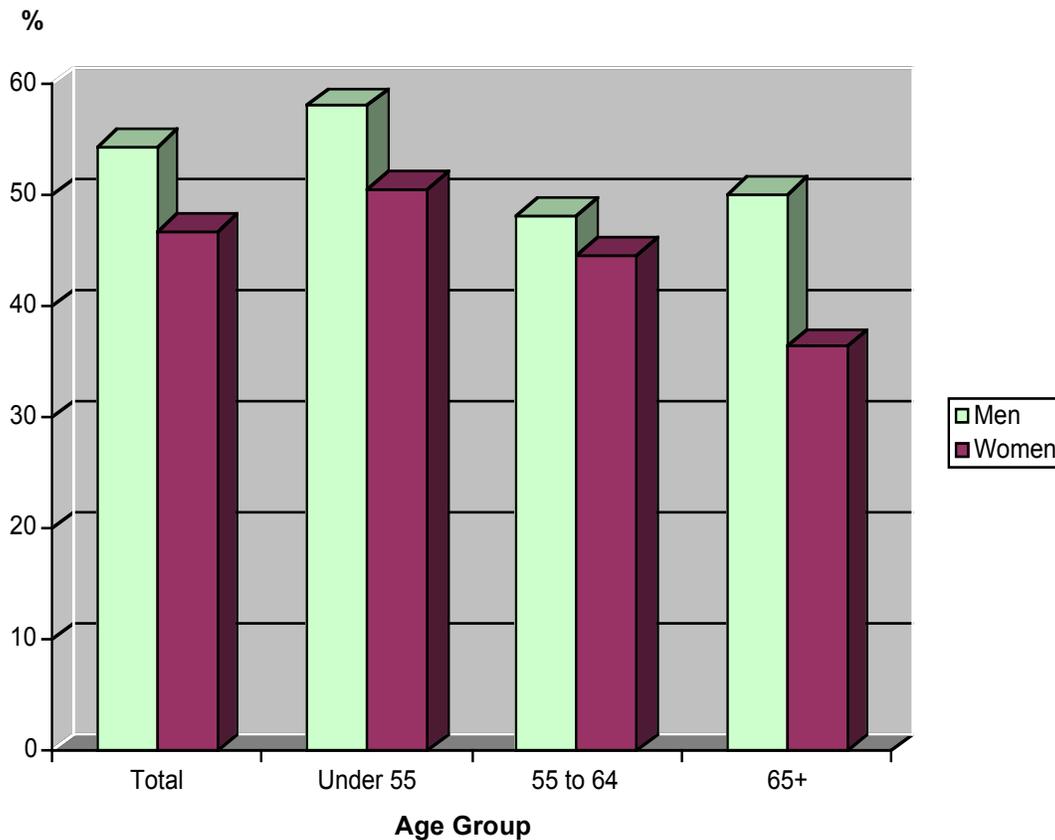
breathing increase substantially” (Dergance, Calmbach, Dhandra, Miles, Hazuda, & Mouton, 2003, p. 863). Other common categories of PA include energy expended in transportation (e.g., walking or bicycling to a destination) and at work. Here, the term physical activity will be used to describe both exercise and physical activity in general.

Rates of Physical Activity in Older Adults

Health benefits of regular physical activity for older adults have been reported in a vast body of research (e.g., Taylor, Cable, Faulkner, Hillsdon, Narici, & Van der Bij, 2004; Arent, Landers, & Etnier, 2000; Lord et al., 2003). The Canadian government recommends that older adults accumulate 30 to 60 minutes of moderate physical activity on most days of the week (Public Health Agency of Canada, n.d.). Most research studies interpret this to mean five days of the week. Rates of physical inactivity are high in the older adult population. In 2008, 50.6% of all Canadians were at least moderately active during their leisure time, meaning they engaged in the equivalent of 30 minutes of walking daily, or an hour-long exercise class three times per week.

Figure 1: Moderately active or active leisure-time physical activity levels by age and gender,

Canada, 2008



As presented in **Figure 1**, just under half (48.2%) of men and 44.7% of women aged 55 to 64 were considered at least moderately active in 2008. These figures drop to 48.2% of men and 36.5% of women in the 65 and older age group. Older women are the least active age cohort in the total population, and much research supports the assertion that women are consistently less active than men (e.g., Turcotte & Schellenberg, 2007). Activity levels typically decline with age – on average 58.2% of men and 50.6% of women younger than 55 are considered at least moderately active, with total (i.e., all age groups) averages at 54.5% for men and 46.8% for women.

Differences in Older Adults' Physical Activity Levels Across Ethnic Groups

Rates of physical activity vary across cultures, with ethnic minority seniors often exhibiting lower PA levels compared to older adults from majority cultural backgrounds. Ethnic minority older adults are often less physically active than Caucasian Americans (Lim et al., 2008), but the circumstances in Canada appear to be less clear. According to one source, Canadian-born adults of all ages exhibit a healthier pattern of leisure time PA compared to immigrants, who are more often physically inactive (Pérez, 2002). In another Canadian study, however, the rate of physical activity for recent immigrant seniors was no different from that of Canadian-born seniors. Long-term immigrant seniors are in fact slightly more likely to be active or moderately active than Canadian-born seniors (46% and 41%, respectively; Turcotte & Schellenberg, 2007). In contrast with other health behaviours and patterns (e.g., smoking and obesity), there appears to be no clear trend over time toward the convergence of Canadian-born and immigrant patterns of physical activity during leisure.

In a study of 2,912 middle-aged and older American women, King and colleagues found physical inactivity – defined as “no sports or exercise in the past two weeks or no increase in heart rate from activities” (King et al., 2000, p. 358) – to be lowest among White participants (46.7%) and highest among American Indian/Alaskan Native participants (58.7%). When both underactivity (neither inactive nor active) and inactivity are taken into account, Hispanics exhibit slightly lower rates than Whites (87.1% and 89.2%, respectively), with

African Americans reporting the highest (94.0%). Fewer than 30% of minority women in the United States engage in moderate activity “in amounts sufficient to derive health benefits” (Henderson & Ainsworth, 2003, p. 313).

In New Zealand, approximately 30% of adults aged 65 and older do not engage in enough PA to acquire health benefits. This figure is typically higher for those of Pacific ethnicity – up to 35% (Kolt, Paterson, & Cheung, 2006). In a study of female Somali immigrants to New Zealand, Guerin and colleagues (2003) found that 20% of participants reported no PA within the past week, and all participants had participated in less than 2.5 hours of PA during the past week. Ninety-six percent of the women interviewed believed they should exercise more often. Physical inactivity and underactivity are significant concerns for ethnic minority older adults, given the well-documented health benefits of regular exercise, as well as the increased risk of many chronic illnesses and early mortality stemming from physical inactivity.

Benefits and Importance of Physical Activity in Later Life

In older age, physical activity is crucial to maintaining independence, increasing quality of life, and decreasing disability. Research evidence suggests that regular physical activity can counteract age-related functional declines, preserving independence into older age. Many studies found increased levels of agility, balance, flexibility, and cardiovascular capacity with exercise training in participants, even those in advanced old age (80 and older; see Taylor et al., 2004, for meta-analytic review). Between ages 25 and 80, strength is estimated to decrease by 40 to 50 percent (Simons & Andel, 2006), implying decreases in

mobility and an increased risk of falls. Numerous studies have found significant gains in muscle mass and strength, with a lowered incidence of falls, following resistance-training programs.

Sarcopenia, the loss of muscle mass associated with the aging process, is one of the main factors influencing musculoskeletal frailty and reduced mobility in older age. Clinically significant sarcopenia is found in 13 to 24% of adults aged 65-70, and more than 50% of those aged 80 and older. Muscle weakness in the lower limbs is highly predictive of falls, often resulting in fractures, as bone density also decreases with age. More than 90% of hip fractures are due to falls, with 12 to 20% of these fractures leading to death (Taylor et al., 2004). A range of studies found a decreased incidence of falls with resistance training, but the respective roles of weight-bearing exercise, flexibility, balance, and reaction time in preventing falls warrant further investigation.

The cardiovascular system progressively deteriorates with age, decreasing in functional and endurance capacities. However, the ability of the cardiovascular system to adapt to endurance training does not change with age, with similar gains in maximal oxygen uptake (VO_{2max}) in younger and older adults in response to training programs (Taylor et al., 2004). The influence of endurance training programs on mortality and morbidity should be a major research focus because the major cause of death in older adults is cardiovascular disease. Unfortunately, no long-term prospective primary prevention data examining this area are available to date. Cross-sectional and intervention studies, however, have found increases in cardiovascular health (and thus decreases in risk factors

for cardiovascular disease), such as increased high-density lipoprotein ('healthy' cholesterol), decreased low-density lipoprotein ('unhealthy' cholesterol), and lowered rates of hypertension (Taylor et al., 2004).

Regular exercise also has benefits for emotional and mental health. Physical activity appears to have a protective effect on developing depression, as well as an antidepressant effect for older individuals already exhibiting clinical depression (Taylor et al., 2004). Randomized controlled trials, cross-sectional studies, as well as prospective longitudinal studies have found similar relationships in this area. Although some researchers argue that depression and poor physical functioning are mutually reinforcing, leading to a downward spiral in physical and psychological health, other scholars conclude that "the potential of physical activity to have an antidepressant effect outweighs the possibility that it may not" (Taylor et al., 2004, p. 713).

Aerobic exercise has been shown to decrease symptoms of anxiety, but this relationship is less clear with older compared to younger age groups. Some studies found small program effect sizes, while others found no effect. Many did not take co-existing morbidity into account – a factor especially relevant to older adults. Positive mood is found more often in individuals who exercise regularly in comparison to those who do not, even when those who reported poor health are not included in analyses. Based on a meta-analysis of 32 studies on older adults, individuals in exercise training groups exhibited greater improvements in mood compared to control groups (Arent, Landers, & Etnier, 2000). Physical

activity clearly has significant and broad implications for older adults' physical as well as psychological well-being.

Investigating Relationships Between Ethnic Background and Physical Activity

What is Ethnic Background?

The term *ethnic background* or *ethnicity* is often used interchangeably with terms such as *culture* or *race*. Studies conducted in the U.S. have typically focused on *race* (e.g. Hispanic, Black, White), whereas in Canada *ethnic background* is usually deemed more relevant as a construct in social-psychological studies. Similarly, in this study, “ethnic background” and “ethnicity” refer to participants' self-reported membership to a particular group, based on broad geographical areas and/or a common heritage (real or assumed). These terms also inherently pertain to shared physical or physiological characteristics potentially including genetics.

It is important to take into account within-group differences. Among individuals of any particular ethnic background, differences in preferred exercise types, physical activity patterns, as well as perceived motivators and barriers to exercise class attendance may be more pronounced than between-group differences (i.e., differences between ethnic groups such as Caucasians and East Asians). Acculturation may play a significant role in affecting within-group differences. For instance, ethnic minority older adults who have lived in Canada for many years may exhibit health behaviours more closely aligned with

Caucasian Canadians than recent immigrants who have lived in Canada for less than one or two years.

The term “culture” will be used to describe a much broader concept, taking into account the values, beliefs, knowledge, traditions, and lifestyles that are connected to ethnicity. Because of the broad nature of this term and the inherent challenges in formulating studies around it, the present research will focus on *ethnic background* as a socio-demographic variable self-selected by participants in surveys.

Why Study Physical Activity and Ethnic Background?

A range of variables has been found to predict older adults’ exercise behaviour. These include self-efficacy, outcome expectations (Resnick, 2001), beliefs about the benefits and costs of exercise (Paxton, 1997), built environment characteristics (Li, Fisher, Brownson, & Bosworth, 2005; King 2008), perceived physical and mental health, life satisfaction, perceived stress, sense of social belonging (Shilpa & Baker, 2008), and sociodemographic variables such as living arrangements (Chipperfield, 2008). The role of ethnic background, however, has received limited research attention and requires further study.

Although qualitative studies have investigated the influence of ethnic background on perceived barriers to and motives for engaging in PA, additional research in the area is required to deepen our understanding of how specific contexts influence older adults’ PA behaviours, as well as differences between ethnic groups. A greater understanding of the interaction between ethnicity and

PA could help health professionals to promote PA among diverse groups of older adults.

Across ethnic groups in Canada and the US, walking is the most common form of physical activity for adults of all ages (Taylor et al., 2004; Statistics Canada, 2008a). We can conclude from existing research that, although groups are typically more similar than divergent, differences in facilitators for, barriers to, and definitions of PA exist across ethnic groups (e.g. Belza et al., 2004; Dergance et al., 2003; Lim et al., 2008; Tudor-Locke, Henderson, Wilcox, Cooper, Durstine, & Ainsworth, 2003; Wilcox, 2002). It follows that PA interventions for older adults tailored to particular ethnic groups – currently an underdeveloped research area – would be beneficial, perhaps increasing older adults' participation rates, fitness levels, enjoyment of and motivation for PA, or long-term adherence to exercise programs or active lifestyles.

Therefore, future research should focus on the need for such interventions and programs. Are they more effective than conventional options? Which cultural aspects should be taken into consideration (e.g., family structure, religion, language, values, traditions)? How can health and fitness professionals address concerns from all ethnic groups when working with multicultural populations? A detailed understanding of how culture contributes to PA will aid health professionals and researchers to create successful PA intervention programs as well as PA promotion campaigns.

Theoretical Perspectives

The study of ethnic background and PA encompasses very broad concepts that need to be defined, synthesized, linked, and explained. The social-ecological theoretical perspective (Bronfenbrenner, 1992) is particularly relevant to the study of ethnicity and PA, and will be used as the overarching framework. Constructs from two other theories that have been applied to physical activity research – the health belief model (Rosenstock, Strecher, & Becker, 1988; Janz & Becker, 1984) and the social cognitive theory (Bandura, 1986) – will supplement the social-ecological perspective.

Numerous theories have been applied to the physical activity literature and the development of PA interventions; not all can be summarized here due to space limitations and the scope of the project. Stages of change models (e.g., the transtheoretical model) as well as theories of reasoned action and planned behaviour concern the decision-making processes involved in first adopting an exercise program or active lifestyle. The current study focuses on already-active older adults and variations in activity levels, which calls for a perspective that addresses not only sociocultural and environmental factors, but also individual or personal factors influencing PA behaviours over time. The three theoretical perspectives used in this study have been chosen based on their applicability to both personal and environmental influences on health behaviours.

Social-Ecological Perspective

The social-ecological perspective provides a framework to contextualize the correlates of physical activity. There are numerous theories under the umbrella

of social-ecological perspectives, including the biopsychosocial model and the person-environment fit theory (Stokols, 1996). Here, social-ecological perspectives will be described as meta-theory, organizing a vast range of concepts and sub-theories into a coherent framework. This perspective began with Urie Bronfenbrenner's (1992) ecological systems theory, which divided variables into macro-, exo-, meso-, and micro- levels, focusing on the person-environment interaction. Current social-ecological perspectives related to physical activity take into account micro-, meso-, and macro-level variables, thus mapping well onto the notions of culture as a shared social and environmental context as well as an influence on individual cognition and behaviour. Within this broad perspective, intrapersonal, interpersonal, physical environmental, and sociocultural factors interact to inhibit or facilitate engagement in physical activity (King, Stokols, Talen, Brassington, & Killingsworth, 2002).

Social-ecological perspectives emphasize the interactions between individuals and their environments: People-environment transactions involve mutual influence, whereby physical and social characteristics of an environment affect an individual's health and health behaviours, and individuals modify the healthfulness of their environments (either individually or through social action; Stokols, 1996). Environments have various social, physical, and cultural dimensions that interact to influence outcomes such as social cohesion, health status, emotional well-being, and health behaviours. Social-ecological perspectives also address personal factors such as psychological dispositions, genetic heritage, and behaviour patterns, focusing on the interactions between

personal and situational factors. Physical environment factors, such as the availability of recreational facilities, may not affect all individuals in the same way. Social-ecological perspectives take into account the mediating personal variables – such as culture – that could influence the “fit” between individuals and their surroundings. Thus, the key determinant of health and illness from within this framework is the degree of fit between an individual’s biological, behavioural, and sociocultural needs and the available environmental resources (Stokols, 1996).

From the field of ecologic psychology, *behaviour settings* are meso-level “regions of the physical environment that are associated with recurring patterns of organized social activities” (King et al., 2002, p. 19). These can include healthcare institutions, schools, workplace and business establishments, and recreational venues (e.g., gyms, ice skating rinks, sports stadia, parks, trails). Behaviour settings are specific physical locations characterized by sets of organized activities or predominant behavioural patterns, such as the procedures involved in school activity programs, or the athletic activities occurring at gyms. Behaviour settings can influence physical activity patterns both physically and socially. For example, older adult residents of neighbourhoods that have a high density of green and open spaces tend to engage in more PA than older adults living in neighbourhoods that incorporate fewer such areas (Li et al., 2008). As meso-level environmental units occurring in a community context, behaviour settings help to cultivate social exchanges and connections between individuals who frequent them. Residents living in areas that contain many behaviour

settings and a variety of setting types are likely to exhibit high levels of social trust and civic engagement (King et al., 2002) – aspects of social capital.

Culture influences the nature of behaviour settings as well as their uses by diverse cultural groups. The dominant culture in a certain society creates most behaviour settings and expects their users to follow social norms inherent in that culture. Community fitness centres in North America are designed to house a variety of equipment and spaces to facilitate being active, including fitness studios, weight rooms, swimming pools, and gymnasiums. The characteristics associated with this behaviour setting do not apply to all cultures, due to issues such as gender segregation and differences in exercise attire norms between North Americans and other cultural groups. According to the social-ecological framework, individuals whose behavioural and sociocultural needs are not met by environmental resources available in their communities should exhibit lower health status compared to groups that are able to attain their needs from the environment (Stokols, 1996). Indeed, ethnic minority groups often exhibit lower health status and lower physical activity levels than majority cultures.

The social-ecological approach is inherently interdisciplinary, drawing from diverse areas such as psychology, biology, urban planning, and sociology to adequately describe micro-, meso-, and macro-level interactions between individuals and their environments. The framework can integrate both behaviour change (on an individual level) and environmental change strategies to form broad health promotion interventions. By incorporating more than one level of analysis (e.g., personal, institutional, and societal levels), the social-ecological

perspective promotes a holistic view of health behaviours and prevents conceptual “blind spots” that could occur from focussing on solely behavioural or environmental factors (Stokols, 1996). However, such a comprehensive theoretical approach contains inherent logistical limitations. Interventions based upon social-ecological theory require the integration of methods and knowledge from different disciplines (e.g., psychology, urban planning, gerontology when focussing on older adults, medicine), and the close collaboration of professionals from different fields. A framework that aims to provide an all-encompassing description of health behaviours might not be as useful as more focused models in generating new research. It is also difficult to test. It would be difficult to determine which variables should be selected for study, and what types of interventions will provide the desired health behaviour results when practical complexities prevent a comprehensive analysis of all concepts included in the social-ecological perspective. However, the social-ecological perspective proves useful to meta-theoretical discourse by synthesizing concepts and results from numerous studies and providing an overarching context from which to develop new research that focuses on a particular branch of the area.

Health Belief Model

Complementing the social-ecological perspective’s broad reach with a more individual-level focus, the health belief model (HBM) is currently one of the most commonly used health promotion and health behaviour perspectives (Sharma & Romas, 2008). While it focuses on cognitive processes and does not directly take into account cultural factors, previous experience, or sociodemographics,

some of its constructs may vary across cultures and prove useful in an integrated model of health behaviour. It also applies well to the notion of culture as a network of knowledge – knowledge that could include health beliefs and other concepts described in the theory. Rosenstock and colleagues developed the HBM in the 1960's, originally meant to predict ill patients' behavioural responses to treatment.

The HBM has six key constructs. First, *perceived susceptibility* describes beliefs about the likelihood of acquiring a disease or reaching a harmful state. With regard to physical activity, this might manifest as beliefs about one's chance of developing heart disease due to inactivity. The more susceptible an individual feels, the more likely he or she will take preventative action. *Perceived severity* is one's belief about the extent of negative consequences that could result from a harmful state due to a particular behaviour. For example, regardless of conclusive research evidence supporting the risks of inactivity, individuals differ in their beliefs about whether inactivity will lead to chronic disease, and how severe these diseases will be. Proponents of the health belief model suggest health promotion programs should attempt to increase perceived susceptibility and perceived severity (together called perceived threat) through education about potential health and illness outcomes. For instance, health educators could mention prevalence rates of chronic diseases related to inactivity to build perceived susceptibility, and discuss specific symptoms and their effects on daily life to increase perceived severity.

The third construct is *perceived benefits*, referring to one's beliefs about the advantages of a particular method suggested by a health promotion program to reduce the risk or seriousness of a disease or harmful state. An individual may believe that cardiovascular exercise offered in an exercise class is more effective at reducing the risk for obesity than weight training, for example. In the current study, perceived benefits are synonymous with perceived motivators. *Perceived barriers* are beliefs concerning actual or imagined costs related to following a new behaviour. Barriers to physical activity often mentioned by older adults include lack of age-appropriate classes (Wilcox, Bopp, Oberrecht, Kammermann, & McElmurray, 2005), inclement weather, and the fear of falling (Belza et al., 2004). Future research should address in greater detail older adults' perceived costs to engaging in exercise programs or active lifestyles over time, rather than barriers to beginning such activities (the current research focus) – a research area that would be more in line with the definition of perceived barriers offered by the HBM.

The fifth construct in the HBM is *cues to action*, described as precipitating forces that increase a person's need to take action. These cues may be external (e.g., social interactions, media messages) or internal (e.g., perceptions of a bodily state). The HBM predicts that if one's perceived severity or perceived susceptibility is low, an intense stimulus will be needed to register as a cue to action. When perceived susceptibility and perceived severity are high, on the other hand, a slight stimulus may be enough to prompt the need for action. Finally, *self-efficacy*, a construct later added to the model as it developed, refers

to the confidence an individual holds in his or her ability to execute a behaviour (Sharma & Romas, 2008), or the “perceived confidence in one’s ability to perform a specific behaviour in a given setting” (Umstattd & Hallam, 2007, p. 207).

The HBM assumes that individuals have a certain level of knowledge related to health behaviours and health promotion, used in forming perceived susceptibility and severity of outcomes, for instance. This cognitive-focused view neglects a range of factors such as socio-demographic influences as well as previous experiences that could shape health behaviours.

The health belief model implies that humans act rationally, with conscious processing about all their health-related decisions. It has been criticized because it does not address emotions. Moreover, individuals may not always plan behaviours or know precisely why they engage in certain behaviours. In addition, the HBM does not take into account beliefs about what will happen in the future, such as social cognitive theory’s outcome expectations and outcome expectancies. As an individual (micro) perspective, the HBM also does not address the role of social contexts and cultural factors in making decisions.

Social Cognitive Theory

Broadening the theoretical scope to include interpersonal environments rather than solely individual variables, social cognitive theory (SCT) attempts to explain human behaviour using “triadic reciprocal causation” (Sharma & Romas, 2008, p. 164). Although the social-ecological approach also addresses interpersonal environments, the social cognitive theory focuses exclusively on this level and thus provides greater detail. The three factors involved are

behaviour, environmental factors, and personal or individual factors (e.g., affect, cognition), which are thought to interact. In this way, human functioning is neither driven solely by internal forces nor controlled and dependent upon the external environment (Bandura, 1986).

Having evolved from Bandura's social learning theory, SCT revolves around acquiring knowledge by observing various models. Interpersonal environments are hypothesized to be essential in predicting and influencing health behaviour, and thus health outcomes (Lim et al., 2008); the notions of culture as networks of knowledge and information passed between individuals fits very well here. Social cognitive theory provides a useful framework through which to understand cultural variations in PA patterns. Its wider scope and attention to environmental, individual, as well as interpersonal factors maps well onto the construct of culture – a broad shared context acquired through social learning (Heine, 2008) that influences individuals' values, beliefs, lifestyles, social norms, and expectations.

The *environment* comprises factors external to an individual, while *perceptions* of one's environment are also important. Access to exercise facilities, path continuity, crosswalks, and presence of sidewalks are among the many objectively measured environmental factors associated with physical activity (King, Brach, Belle, Killingsworth, Fenton, & Kriska, 2003; King, 2008). The current study investigates environmental barriers such as bad weather and inconvenient location of facilities. Perceptions of the neighbourhood environment, even when not correlated with objective measures of environment, have been found in numerous studies to affect physical activity behaviours (e.g.,

Wilcox et al., 2003). *Expectancies* are a significant component of SCT. In contrast to behaviourism (the dominant tradition at the time SCT was first developed), where actions are viewed as shaped entirely by reinforcements and punishments in the environment, SCT explains behaviour in terms of individuals' *expectations* about rewards and punishments in the environment (Cervone & Pervin, 2008). Thus, expectancies can help us to understand why two people may respond differently to the same environmental occurrences: They have differing expectations about what may happen. This adds the potential influence of future events and perceptions missing in the health belief model. *Outcome expectancies* are values one places on a particular outcome, which are contrasted with *outcome expectations* – perceived anticipatory outcomes of particular behaviours, such as improved health or weight loss due to physical activity. Outcome expectations are learned through previous experiences, emotional or physical responses, and observation, implying that modelling positive outcomes of health behaviour may help individuals to acquire and maintain these behaviours (Umstatted & Hallam, 2007). Three types of outcomes are described: (1) physical outcomes, including positive and negative consequences of behaviour, (2) social approval or disapproval related to engaging in a particular behaviour, and (3) positive and negative self-evaluations.

The current study focuses on the first type of outcome and variance between ethnic groups. As consequences of health behaviour (in this case participating in exercise classes), outcomes in this category include stress reduction, weight loss, increased mental and physical health, and increased muscle strength.

The second outcome type is particularly relevant to culture as an overarching context. For example, Latino older adult participants in one study believed that being physically active in later life was inappropriate, and instead emphasized relaxation and “slowing down” (Melillo et al., 2001). Active older adults in this community often felt shame and social disapproval related to their behaviours, and presumably experienced less social support for active lifestyles compared to groups in which social approval was stronger. Social cognitive theory posits that the higher the expectations, the greater the potential for behaviour change. Similarly, the higher one’s outcome expectancies are, the higher the likelihood of engaging in a behaviour (Sharma & Romas, 2008).

Expectations about one’s own performance in specific domains is termed *self-efficacy*, a construct often used to study PA behaviour, and shared with the health belief model. Self-efficacy is the most significant and empirically supported predictor contained in the SCT (Sharma & Romas, 2008); self-efficacy was likely added to the health belief model because of its strong empirical support.

Social cognitive theory has been supported in numerous physical activity studies; however, some of its constructs are more strongly related to PA outcomes than others. It has been used to study PA mainly in younger and middle-aged populations, most of which are Caucasian. Umstattd and Hallam (2007) tested whether self-regulation, self-efficacy, and outcome-expectancy value (the interaction between outcome expectations and outcome expectancies) predicted older adults’ exercise behaviour. *Self-regulation* is a personal variable

referring to the control of goal-oriented behaviour, potentially involving self monitoring, problem-solving, decision-making, and self rewarding (Umstaddt & Hallam, 2007) – constructs applicable to maintaining an active lifestyle and/or exercise program. After controlling for demographic variables, self-regulation was the only SCT construct that distinguished between participants who engaged in regular PA and those who were inactive.

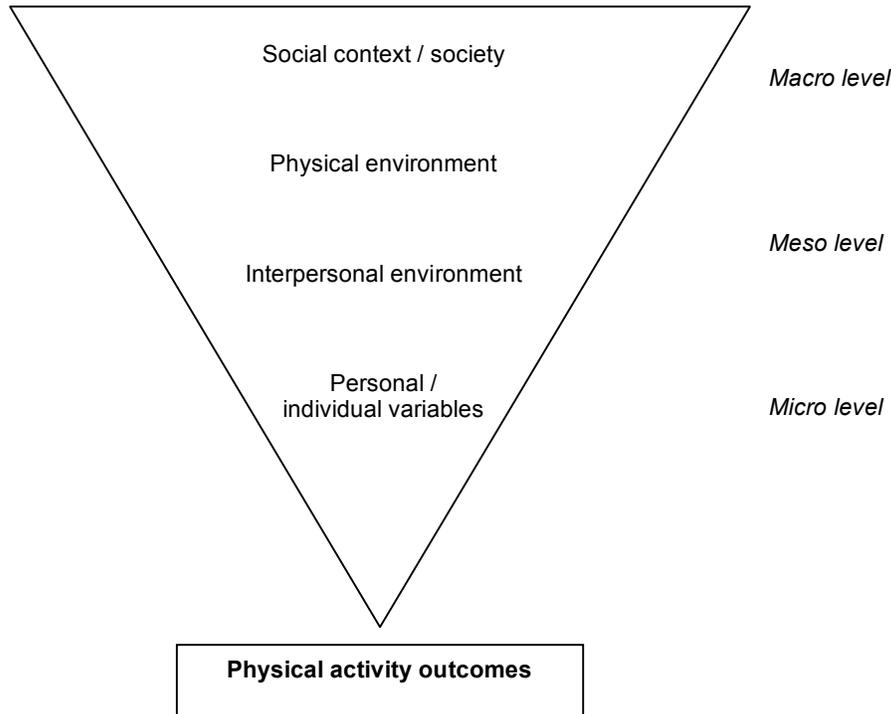
Social cognitive theory includes many constructs, which leads some scholars to criticize it for attempting to be too comprehensive. Because it is challenging, and indeed in many cases impossible, to reify all of SCT's numerous constructs in a single study, its usage may be limited (Sharma & Romas, 2008). Ideally, a theory is parsimonious, consisting of a few principles or assumptions that lead to many testable predictions. Prochaska (2006) criticizes SCT for lacking arrangements of constructs in mathematical relationships, or models, which may cause researchers to use different sets of constructs in different combinations. In other words, SCT provides a list of variables, but does not propose systematic relationships to connect them.

Interdisciplinary Model of Culture and Physical Activity

The interdisciplinary model of culture and physical activity was created for this study, synthesizing constructs of the health belief model and social cognitive perspective with the general framework of the social-ecological model (see **Figure 2**). It will be used to develop research questions and to direct the interpretation of study results. Based on definitions of culture as networks of knowledge, shared contexts, and information acquired through social learning,

this is a broad theoretical framework that takes into account both individual factors and the social environment to explain health behaviours.

Figure 2: Interdisciplinary model of culture and physical activity



The interdisciplinary model of culture and physical activity adopts the general ecological paradigm of differentiating between micro- (individual), meso-, (interpersonal) and macro- (societal) level contexts, organizing concepts into hierarchies beginning with personal variables and expanding to the social context/society. Its purpose is to conceptualize the influence of culture on correlates of physical activity, and to guide future theory-driven research in the field. Because culture can influence physical activity correlates at many different levels, a pyramid style depiction of influences on an individual's perceived

barriers and motivators for PA is presented, with constructs in decreasing broadness.

Concepts from the health belief model are situated near the bottom of the pyramid in the integrated model of culture and physical activity, representing personal, micro-level variables. The social cognitive theory is placed at the meso level, representing its focus on interpersonal environments. The social-ecological construct of behaviour settings is a meso-level variable representing interactions between individuals and their community environments. The interdisciplinarity of the model stems from its broad nature, taking into account individual factors (e.g., personality psychology), interpersonal and physical environments (e.g., social psychology, urban planning, environmental psychology), and societal factors (e.g., sociology, anthropology).

The current study focuses on physical activity motivator and barrier variables at the micro level, with a few at the meso level. Personal/individual variables at the micro level include the health belief model constructs of perceived benefits and perceived barriers – in this case, of attending exercise classes. Increased muscle strength, stress reduction, lack of time, lack of motivation, health issues, and the cost of classes, for instance, are potential motivators and barriers that occur on an individual level. Social cognitive theory at the meso level of the interdisciplinary model of culture and physical activity includes motivators such as social interaction and barriers such as family responsibilities and nobody with whom to attend classes. The physical environment is also included in the social

cognitive theory; this study includes bad weather and inconvenient location of exercise classes as potential barrier options.

Results from the study will be interpreted based on the integrated interdisciplinary model, categorizing perceived motivators and barriers into its micro or meso levels of analysis. The model will provide the basis for recommended future research, which should strive toward a more holistic view of the cultural factors influencing physical activity behaviours and how they do so, taking into account individual, environmental, and societal characteristics.

Research Questions

The main research question posed in this project is *How do perceived motivators and barriers to exercise class attendance vary across cultures?* Several secondary research points will be investigated via the survey, such as beliefs about the frequency with which older adults should engage in PA, types of PA most often engaged in, outcome-expectancy values, as well as frequency and duration of weekly PA. Results from the study will help to answer the broad question *What factors may contribute to the disparities in PA levels between ethnic groups (i.e., ethnic minorities exhibiting lower rates than the majority culture), documented among older adults as well as other age groups?* It is well known that this disparity exists; however, potential causal variables have not been often examined. The following table presents the study's research questions concerning differences between ethnic groups, formulated to guide data collection, data analysis, and results reporting.

Table 1: Research questions

Group Differences between Ethnic Minority and Caucasian Participants

1. How do perceived barriers and motivators to exercise class attendance vary by culture?

Do these potential differences remain statistically significant when controlling for basic demographic variables?

2. Is there a disparity in physical activity levels between ethnic minority participants and Caucasian participants?

Does this potential disparity remain statistically significant when controlling for basic demographic variables?

3. Do potential differences between ethnic groups in barriers, motivators, and activity levels vary by survey group (i.e., non-class versus class)?

Chapter 2: Literature Review

Perceived barriers and benefits of PA are – not surprisingly – associated with levels of exercise among older adults. In a study of older African American women, Jones and Nies (1996) found that participants who perceived exercise to be more beneficial and listed fewer barriers to exercise exhibited higher levels of PA compared to other participants. Although there are many other variables associated with PA, this thesis focuses on perceived barriers and motivators for two reasons. First, most cross-cultural research to date has investigated these constructs, forming the literature review and a research base from which to explore the more specific domain of exercise classes. Second, increasing perceived benefits while decreasing perceived costs of PA may prove to be a relatively straightforward health promotion approach to increasing seniors' physical activity levels. Future research should examine the respective roles of perceived benefits and costs in predicting PA outcomes versus each of the many other factors studied to date (e.g., health beliefs, stages of change, physical health, etc.).

Most research investigating older adults' barriers and motivators for being physically active has been conducted on White, sedentary or minimally active older adults in the United States. The typical study involves focus groups or interviews in which older adult participants discuss factors they believe to be interfering with their capacity to engage in PA, as well as factors they believe would increase their PA levels. Survey methods are also often used, either alone or in combination with focus groups and/or interviews. Some studies pose broad

open-ended questions, such as “Describe what you do on a regular basis that involves physical activity” (Belza et al., 2004, p. 12), while others investigate more focused aspects of PA (e.g., “How confident are you in your ability to exercise for at least 20 minutes, two times a week?”; Walcott-McQuigg & Prohaska, 2001, p. 198) or specific domains within PA (e.g., a focus on aquatic exercise; Kang et al., 2007). Concepts such as PA’s meaning, role in daily life, benefits, and costs are discussed. Psychological, social, cognitive, and physiological aspects of PA are also identified, including enjoyment, social benefits and group cohesion through physical activity, maintaining mental acuity, and managing chronic conditions (e.g., Kolt et al., 2006; Wilcox et al., 2003).

Table 2 presents a framework that conceptualizes how culture and perceived predictors of PA interact, from both person- and program-based approaches. The framework will be used to interpret data from the survey, which focuses on exercise class participation. Using the framework in the literature review will help to distinguish between the issues that relate to exercise classes from factors that apply to PA in general.

Table 2: Interactions between culture and perceived predictors of PA: A framework

	<i>Barriers</i>		<i>Motivators</i>	
	Person-based	Program-based	Person-based	Program-based
Culturally specific	e.g., language barriers	e.g., lack of gender segregation for Muslim participants	e.g., having a “workout buddy” who speaks the same language	e.g., classes held in languages other than English; cultural homogeneity in classes
Cross-cultural	e.g., physical health concerns	e.g., program cost, lack of transportation	e.g., opportunities to socialize while engaging in PA	e.g., encouragement from others in class

Perceived barriers and motivators of PA (including engaging in exercise classes) can be *culturally specific* or *cross-cultural*. Culturally specific predictors considered to be motivators or barriers describe factors stemming from specific cultural values, practices, or beliefs that are not shared among most cultures. They may be unique to one culture, or found in more than one culture (potentially to varying degrees in some cultures), but they are not universal. Accounting for these factors in multicultural settings would be extremely difficult, if not impossible. For example, an issue of unique importance to many Muslim individuals is gender segregation. Many older adults from Muslim cultural backgrounds feel uncomfortable exercising at non-gender-segregated facilities, and would find it inappropriate for a woman to lead an exercise class for men, for instance (Rogerson & Emes, 2006). Given that gender segregation in Muslims is based on religious and cultural beliefs and that it applies to exercise facilities and classes, we would classify this as a culturally specific program-based barrier. Language barriers (generally different for each culture) are categorized as culturally specific person-based barriers to PA. The same construct of cultural specificity in predictors of PA is also applied to motivators.

Cross-cultural perceived predictors of PA may vary among different cultures in prevalence and/or importance, but they could exist among most or all ethnic groups. Findings from several studies of African American older adults found an emphasis on social aspects of PA, such as the facilitating role of friends in maintaining an active lifestyle and the hindering role of familial responsibilities in being active (Belza et al., 2004; Richter, Wilcox, Greaney, Henderson, &

Ainsworth, 2002; Tudor-Locke et al., 2003) – concepts mentioned more often by this group than other ethnic groups studied. These factors are categorized as cross-cultural person-based motivators and cross-cultural person-based barriers, respectively. Cross-cultural program-based barriers include issues that older adults from many cultural backgrounds commonly mention in research studies, such as program costs and lack of transportation (Wilcox et al. 2005). Cross-cultural program-based motivators may encompass having a model leader and social opportunities in exercise classes (Clark, 1999; Kang et al., 2007).

Although the boundaries between culturally specific versus cross-cultural, and person-based versus program-based perceived predictors of PA are not always clear-cut, this typology provides a useful reference point and organizational scheme to guide both the literature review and study portions of the thesis. For a literature review table showing basic article summaries, see **Appendix A.**

Barriers to Physical Activity

Cross-cultural person-based barriers

Physical health problems and conditions are some of the most frequently reported barriers to PA, and are listed by older adults of most cultural backgrounds. Back pain, knee pain, shortness of breath, fatigue caused by exercise, dizzy spells, and lack of energy are other commonly mentioned physical barriers to PA (Jones & Nies, 1996; Belza et al., 2004). Health problems was the most frequently reported barrier to being active in a study of

African American and White women aged 50 and older (Wilcox, Oberrecht, Bopp, Kammermann, & McElmurray, 2005).

Older adults of most ethnic groups report personal barriers to engaging in PA. In a study of White and African American older adults, Wilcox et al. (2005) found that African Americans reported more personal barriers than White participants. The most common personal barrier cited by older adults is lack of motivation (e.g., Kolt et al., 2006; Walcott-McQuigg & Prohaska, 2001; Wilcox et al., 2003), but few studies investigate this point more closely. Perhaps a lack of knowledge about the importance of PA, no time, tiredness, or few perceived benefits of exercise factors into this construct.

Across several studies, African American older adult participants frequently mention the social environment as a barrier to engaging in regular physical activity – more often than other ethnic groups. Perceived social barriers of this group include the demands of single parenting (Richter et al., 2002), family responsibilities (Walcott-McQuigg & Prohaska, 2001), household responsibilities, community obligations (Wilcox et al., 2003), and caregiving duties (King et al., 2000).

Cross-cultural program-based barriers

Not living in proximity to a community centre or other exercise facility is a common barrier (e.g., Wilcox et al., 2005). The lack of a convenient facility was the most frequently mentioned barrier to PA in a study of Korean American women aged 60 to 78 (Kang et al., 2007). Lacking exercise-related outdoor spaces is also commonly mentioned, including not having a yard when living in

an apartment (Richter et al., 2002) and not having access to parks for walking or other activities (Belza et al., 2004; Richter et al., 2002).

Whaley and Ebbeck (1997) investigated older adults' barriers to structured exercise classes by interviewing 17 older adults who were active in a seniors' centre but did not attend exercise classes offered there. The most commonly reported constraint to participating in exercise classes was getting enough physical activity elsewhere, making classes unnecessary. Some participants also mentioned that the structure of classes was inconvenient, and that classes require too much commitment. Two participants (one female and one male) did not attend exercise classes because they wanted their physical activity to have a purpose, such as gardening or household work. "Kicking your feet in the air" (Whaley & Ebbeck, 1997, p. 199) was perceived to be a waste of time, with no benefit. In light of this finding, the authors note that exercise classes could be marketed differently, focusing on general health rather than specific outcomes such as muscle definition or flexibility. Tangible outcomes such as the ability to reach the highest cupboard in the kitchen may encourage participants to view benefits of exercise more holistically, applying to activities of daily living as well as to physical and psychological health. A few participants believed that greater flexibility in the times that classes were held would increase participation. Other class-specific constraints included the type of classes offered, the fact that classes are composed of mostly women (reported by two male participants), self-consciousness related to exercising with others, "rather organize activities myself", and "don't know what they do" (Whaley & Ebbeck, 1997, p. 198). In

addition to reporting self-identified constraints, participants chose barriers that applied to them from a list based on previous literature, compiled by the researchers. The three most commonly chosen constraints from previous research were structured classes are inconvenient, lack of time, and not enjoying the types of activities offered.

Culturally specific person-based barriers

In a study of Latino older adults, participants aged 59 to 76 viewed exercise in later life as inappropriate and attributed shame to engaging in physical activity (Melillo et al., 2001). These older adults believed that the retirement years were a time to slow down and to relax, and that engaging in PA as a senior implied not accepting that one's younger years were over. It follows that Latino seniors likely would not be encouraged to remain active in their later years, and social support for those who do may be sparse. In a correlational study of 2,912 women over the age of 40, King and colleagues (2000) found discouragement from others about being active to be associated with decreased self-reported PA.

Sedentary and underactive African American participants aged 50 and older discussed the lack of active role models during their childhoods. They stated that exercise had never been emphasized in their culture, and that previous generations had been active without deliberately exercising (e.g., household and agricultural work; Wilcox et al., 2005). Tongan older adults living in New Zealand mentioned activities such as mat weaving, gardening/harvesting, dancing, fishing, and climbing coconut trees traditionally performed by people of their

culture. Living in more modern contexts, however, limited their ability to be active in these ways (Kolt et al., 2006).

Culturally specific program-based barriers

Participants from certain ethnic groups represented in the current literature describe religious and cultural factors that may present barriers to being physically active in a North American context. Somali immigrants in New Zealand, for example, mention praying five times daily as a potential barrier, especially during scheduled programs such as exercise classes (Guerin, Diiriye, Corrigan, & Guerin, 2003). Language barriers are especially applicable to exercise classes, where verbal instructions are to be followed. The female refugee Somalis in this exercise intervention study emphasized the importance of exercising in a women-only facility, being able to dress appropriately for exercise without the presence of men or the possibility of being seen by men while exercising.

Religious issues also surfaced, including Ramadan and music. During Ramadan, which involves fasting from dawn until sunset for one month, exercise classes offered as part of Guerin and colleagues' study were cancelled. The authors note that a longer-term solution may be to offer such classes later in the evenings during Ramadan, after individuals have eaten. Thirty-five percent of the women in Guerin et al.'s study reported not liking the music played during exercise sessions, some mentioning that its messages ran against their religion. It is interesting to note that the average age of women reporting a dislike of the music was 52, compared to an average age of 26 for women who said they did

like the music or that it did not matter to them. These findings point toward the importance of maintaining a focus on individual differences within cultures when considering adherence to and enjoyment of physical activity programs.

The Somali women in this study also mentioned issues of safety and discrimination regarding outdoor physical activity. Walking and sports classes were held in a high school field. At the request of the participants, these sessions were held after dark due to the field's high visibility from surrounding streets. When car headlights would shine into the field on occasion, the women would stop walking or kicking a football and turn their backs to the road. The women felt walking on sidewalks would be unsafe, due to potential derogatory comments from New Zealanders aimed at them and their colourful clothing. A local mosque had been vandalized in light of the September 11, 2001 terrorist attacks, and the participants believed it was not safe for Muslim women to be out of their homes.

Certain ethnic groups represented in the literature express a desire to be active with other older adults of the same cultural background, citing the absence of such opportunities as barriers to PA. Tongan seniors living in New Zealand, for example, felt reluctant to exercise with non-Tongan others, describing cultural differences in exercise attire and embarrassment related to being active with other seniors (Kolt, Paterson, & Cheung, 2006). American Indian/Alaskan Native and Korean participants in Belza et al.'s (2004) study reported isolation from others of the same ethnic group as a barrier to PA. Older Latinos believed they would be more active if they could "get together as Latinos, to speak [their] own

language and to be taught the importance of exercise in [their] own language” (Melillo et al., 2001, p. 42). Although the preference for cultural homogeneity can occur across many different cultures, here it is classified as a culturally-specific program-based barrier because the reasons for such a preference may vary by culture.

Motivators and Facilitators for Physical Activity

Cross-cultural person-based motivators

Although physical health concerns frequently are reported as barriers to regular physical activity, American Indian/Native Alaskan participants in Belza et al.’s (2004) focus group study discussed the role of living with chronic illnesses in raising awareness of the importance of being active in later life. Improving one’s general health and losing weight are other common motivational factors mentioned across cultures. Wilcox and colleagues (2005) found that both African American and White older adult participants cited improved health and weight loss as motivators for being physically active, with weight-related benefits mentioned more often by African-Americans and mental health cited more often by Whites.

Older adults with East Asian or Southeast Asian backgrounds tend to report physical health benefits and motivators more often than other cultural groups, both holistically and in detail. In Belza and colleagues’ (2004) study of adults aged 52 to 85, Vietnamese participants mentioned blood circulation, avoiding medication, and longevity as benefits of and facilitators to being active. Chinese

older adults from Vietnam listed overall health, and Koreans reported relieving joint pain and aiding digestion.

For American Indian/Alaskan Native participants in King et al.'s (2000) correlational study, self-consciousness about physical appearance was positively associated with reported PA levels. Male African American participants aged 55 to 70 listed willpower and knowing the importance of regular PA as motivators for regular exercise (Clark, 1999).

Although social facilitators and benefits of PA are reported across cultures, African American, Latino, and Filipino older adults generally report more of these factors compared to other ethnic groups. Older African Americans in one study felt motivated by group activities and encouragement from friends (Belza et al., 2004). African Americans' reported PA levels are associated with observing others exercising in their neighbourhoods (King et al., 2000). Latino participants feel that their faith is an integral component of their daily lives, and often participate in church activities. Music, dance, singing, and socializing are facilitators for these older adults. Physical activity is viewed as part of a larger social context for Filipinos, who stress the importance of socializing with other Filipinos (Belza et al., 2004).

East Asian and Southeast Asian older adults commonly refer to the significance of a daily activity routine, such as walking or Tai Chi, in maintaining overall physical health (e.g., Belza et al., 2004). Rather than attributing differences in *levels* of PA to culture, younger African American women in Richter et al.'s (2002) study described perceived differences in preferred activity *types*

across cultures. They believed White women more often exercised in gyms and Latinas more often danced, for example. These participants also indicated that differences in PA levels could stem from differences in work environments, which may or may not vary by culture.

Cross-cultural program-based motivators

Research investigating older adults' perceived motivators and barriers to exercise class attendance is scarce. Although some researchers have investigated perceived barriers to engaging in structured group exercise (Whaley & Ebbeck, 1997), we know little about the factors that older adults believe would increase or support their participation in such activities. The aim of the study is to fill some of this gap in the literature.

Tu, Stump, Damush, and Clark (2004) investigated the effects of health and the environment on exercise class participation in urban African American and White women aged 50 to 82. Although this study does not directly address perceived barriers and motivators, it sheds light upon factors that may influence older adults' participation in structured exercise classes. The researchers found that participants who reported better health, less physical pain, and lived in census tracts where a higher percentage of workers walk to work were less likely to drop out of an exercise class program. Adverse weather conditions including extreme temperatures, snow, and overcast skies were associated with intermittent non-attendance.

Culturally specific person-based motivators

From the review of literature on ethnic minority older adults' perceived motivators and barriers to PA, no person-based motivators that would apply only to specific cultural groups were identified. Future research could investigate factors such as a culture's preferred body type or shape and its role in motivating individuals to exercise, or the role of traditional physical activities, for example.

Culturally specific program-based motivators

Older Latinos believed they would be more active if they could “get together as Latinos, to speak [their] own language and to be taught the importance of exercise in [their] own language” (Melillo et al., 2001, p. 42). In this way, group support that fosters socializing and cultural unity, as well as community resources where Latinos could gather, are motivators for being active.

Cultural versus individual differences

It is interesting to note that some participants mentioned individual differences, rather than cultural differences, leading to variations in PA behaviour (Richter et al., 2002). In a review article, Henderson and Ainsworth (2001, p. 28) note that future research should address the questions “Does race [ethnicity] matter relative to leisure and physical activity?”, and “How does the intersection of personal values and cultural values result in physical activity behaviour?”

Chapter 3: Study Methods

Design

This exploratory study builds upon our limited knowledge of cultural differences in older adults' perceived motivators and barriers to exercise class attendance. It utilizes cross-sectional quantitative surveys to address research questions (rather than hypotheses).

Sampling and Recruitment

This study involved a multicultural sample of seniors' centre members (N = 169) aged 50 and older, classified by exercise class participation. The two largest groups of visible minorities in Vancouver are East Asian (including China, Hong Kong, Japan, Korea, and Taiwan) and South Asian (including India, Pakistan, and Bangladesh; Statistics Canada, 2008). These groups are also underrepresented in the existing literature. The study focuses on East Asian older adults from Vancouver and Richmond. A common minimum age for membership to seniors' centres in the Lower Mainland is 55; spouses of eligible individuals typically can join at age 50.

Two study groups were chosen for comparison. One study group is older adults currently engaged in exercise classes, referring to structured, instructor-lead sessions. An additional study group of older adults was sampled – seniors' centre users who do not currently attend exercise classes. These participants could be active in other ways, or sedentary. Members of seniors' centres were used to target as similar a population as possible to the exercise class attendees. The group of non-exercise class attendees was used as a comparison to those

engaged in group exercise – what reasons do they give for not attending classes? Do their perceived barriers differ from those reported by exercise class attendees? The sample of exercise class attendees represents a very small subgroup of seniors. Indeed, many older adults are sedentary, and those who exercise regularly may not attend exercise classes (i.e. they may prefer to exercise alone).

Potential participants were recruited via seniors' centres and cultural centres in Vancouver and Richmond, including Kerrisdale Seniors' Centre, Cambie Community Centre, Minoru Place Activity Centre, South Arm Community Centre, Thompson Community Centre, and the S.U.C.C.E.S.S. program. The principal investigator (with research assistants for some visits) approached scheduled seniors' sessions (e.g., exercise classes, E.S.L. classes, lunch and craft groups, etc.) to briefly introduce the study and ask for participation before each session began. All participants read and signed an informed consent form prior to participating in the study (see **Appendix D** for English informed consent form, and **Appendix H** for Chinese translation).

Data were collected over a ten-month period from May 2010 to February 2011. The principal investigator made a total of 15 seniors' centre visits, for between 2 and 4 hours per visit. Most visits took place between 9:00a.m. and 1:00p.m., given that mornings and early afternoons are generally most busy at these facilities. Exercise classes are typically offered in the mornings, with centre members congregating for lunch between about 11:30a.m. and 1:00p.m.

When sampling ethnic minority groups, a volunteer research assistant speaking either Mandarin or Cantonese accompanied the primary investigator. The primary investigator visited numerous exercise classes at most of the centres involved in the study, giving a brief introduction to the project, asking for participation, and ensuring members were informed that participation was voluntary. The research assistant then translated the introduction into Mandarin or Cantonese (depending on the dominant language at each particular centre). After exercise classes concluded, the primary investigator and research assistant were stationed at a table to hand out surveys and informed consent forms, and to answer questions. Other seniors' centre members who passed by the table and were willing to participate were also recruited. Many of the passers-by fell into the non-exercise class study group.

A total of 169 seniors' centre members aged 50 and older (average age 72.6) participated in the study. The majority of the sample is female (75.7%). Most participants are Caucasian (n=101; 59.8%), with the next largest group being East Asian (n=55; 32.5%). Ninety-three respondents (55%) belonged to the exercise class group, and 76 (45%) completed the non-class version of the survey. Most surveys (n=145) were completed in English, with 24 completed in Chinese. This means that 43.6% of East Asian participants chose to use the Chinese translation versions of the survey.

Measures

The survey method was chosen for this study based on its applicability to quantitative data collection of a number of variables of interest (e.g.,

demographic variables, physical activity frequency, length of exercise class attendance, barriers, motivators, outcome-expectancy values, etc.). It was also selected due to its usefulness in easily collecting many responses rather than conducting in-depth interviews with only a few participants. It therefore offers strengths in generalizability and replication. Ideally, a multi-method approach would have complimented this study, but this was beyond the study's scope.

Two versions of the survey were developed. Version 1 (see **Appendix B**) was completed by exercise class participants, and Version 2 (see **Appendix C**) was completed by seniors' centre members who did not participate in exercise classes at the time of the study. Surveys were professionally translated into Chinese for use with non-English speaking older adults, and informed consent forms were translated into Chinese by a volunteer research assistant. Each version of the questionnaire obtained basic demographic information (i.e., age, ethnicity, income, and education), average weekly frequency and duration of PA, a listing of regular exercise activities, including types of classes (for class participants) and non-class PA, as well as beliefs about recommended PA levels for older adults. The survey was designed to take approximately 5 to 10 minutes to complete, with 31 questions for exercise class participants, and 30 for non-class comparison group participants.

Outcome-expectancy values – a construct from social cognitive theory – were calculated by multiplying participants' outcome expectations of their exercise classes by the importance the participants place on each outcome. Participants rated seven items on outcome expectations and importance. Based

on an instrument developed by Steinhardt and Dishman (1989), participants rated each item from one (“Unlikely to attain” for expectation; “Not important” for importance”) to five (“Likely to attain” for expectation; “Very important” for importance). Participants in the non-class group were asked to rate the same items for importance and likelihood of attaining if they were to attend exercise classes.

Participants in the exercise class group were asked whether they would attend classes more regularly if more members of their cultural group were present, and how important it is to them to exercise with others of the same cultural background. Non-class participants were asked to consider the latter point imagining that they would begin attending exercise classes. All participants selected from a list up to three benefits of exercise classes that are most important to them (hypothetically for those not taking classes), and up to three obstacles to class attendance that they most commonly experience. The lists of possible motivators and barriers were compiled based on the most commonly reported factors in previous literature concerning both ethnic minority and majority culture older adults.

Both versions of the survey contain questions regarding acculturation, adapted from work by Chang, Tracey, and Moore (2005). Their *American Orientation* scale assesses the degree to which attitudes and behaviours relate to American domains of living. Because participants in the current study came from many ethnic backgrounds, survey items analyzed attitudes and behaviours of Canadian culture, rather than addressed the degree to which

ethnic minority participants identify with their own cultures. The five survey items measured language use, cultural identity, relationships, values, and culture.

Data Analysis

The Statistical Package for Social Sciences (SPSS) versions 16.0 and 17.0 were used for all data analysis. Descriptive statistics will provide insight into what types of physical activity older adults in the Lower Mainland engage in, why they (and why they don't) attend exercise classes, the importance of cultural homogeneity in group exercise settings, and other exercise-related exploratory variables. Between-group differences will be examined in exercise class participants versus non-class participants, as well as between East Asian participants and Caucasian participants.

Recoding missing data

Where appropriate, missing data was recoded to either the mean (for interval variables) or the mode (for ordinal variables). Some variables were recoded for the entire sample (e.g. education, activity restriction, beliefs about recommended frequency and duration of PA). Others were recoded differently for class versus non-class respondents. For example, "ECOFTEN" ("How often do you usually attend exercise classes?") was recoded to the mode of 0 ("Never") for non-class participants, and the mode of 4 ("Twice a week") for class participants. Some variables required recoding only for one of the two main survey groups, when variables applied to only one or the other. For instance, asking whether or not respondents were interested in attending exercise classes applied only to the non-class questionnaire. By using the SPSS "Split file" function to calculate the

mode and its function to recode variables only if certain conditions are met, missing data for this variable were recoded to the non-class-specific mode of 0, or “Not interested”.

Computed variables

In order to create a dichotomy, an ethnic group variable was created. Caucasians (n = 101) were coded as “0”, and all others were coded as “1”. 55 of the 68 ethnic minority participants were East Asian (80.9%). Also included in the ethnic minority group were South Asian (n=2; 1.2%), Kenya (n=2; 1.2%), Philippines (n=1; 0.6%), and unspecified “Other” (n=8; 4.7%).

Outcome-expectancy values were computed for each of the seven potential outcomes of exercise classes presented in the questionnaire, based on work by Steinhardt and Dishman (1989). Both the class and non-class versions of the survey contained items assessing participants’ perceived importance and perceived likelihood of achieving these outcomes, on a scale from one (unimportant or not likely) to five (very important or likely). Outcome-expectancy values were calculated simply by multiplying the importance and likelihood values for each item. Thus, outcome-expectancy values ranged from 1 to 25.

The “class” version of the survey contained two items measuring activity levels – one for frequency of exercise class attendance (“ECOFTEN”), and one for frequency of physical activity completed outside of structured classes (“OCOFTEN”). The “non-class” survey version contained only the item assessing physical activity outside classes. In order to test for statistically significant differences in activity levels between ethnic groups, a new variable

was computed. Only one case from the exercise class group was missing data for the “ECOFTEN” variable, so this was recoded to the mean. Next, the remaining missing data – all 76 participants in the non-class group – were recoded to 0. The new variable (“ECOFT.all”) now included all 169 cases. All participants completed the item measuring physical activity outside exercise classes (“OCOFTEN”). The few missing cases in this variable were recoded to the mean, forming “OCOFT.r”. To create an aggregate measure of total physical activity, “OFOFT.r” and “ECOFT.all” were simply added together. The original measures ranged from 0 (“Never”) to six (“Four times a week or more”); thus, the aggregate measure ranged from 0 to 12.

Chapter 4: Results

Results will be presented for the entire sample, class versus non-class study groups, and East Asian participants versus Caucasian participants in order to compare basic physical activity variables, motivators and barriers to exercise class attendance, and outcome-expectancy values. A brief overview of general demographic variables will be presented first, followed by descriptive statistics concerning the study's research questions and relating to exercise and activity levels. These include whole-sample results for survey items that applied to both class and non-class respondents, and survey items that applied only to class participants or only to non-class participants. Physical activity related variables include activity levels, classes participants are interested in or currently enrolled in, perceptions of importance and likelihood of achieving seven potential exercise-related outcomes, as well as barriers and motivators of taking part in exercise classes. Cultural variables will be presented next (split between East Asian and Caucasian participants), and demographic descriptive statistics on the full sample will follow. Results from bivariate analyses will then be presented, addressing specific study research questions.

Descriptive Statistics

Basic demographic variables

A total of 169 adults aged 50 and older (average age 72.56) participated in the study, consisting of mostly females (75.7% female, 20.1% male, 4.1% not stated). The majority of the sample is Caucasian (n=101; 59.8%), with the next largest group being East Asian (n=55; 32.5%). Ninety-three respondents (55%)

belonged to the exercise class group, and 76 (45%) completed the non-class version of the survey. Most surveys (n=145) were completed in English, with 24 completed in Chinese. This means that 43.6% of East Asian participants chose to use the Chinese translation versions of the survey.

Health and activity variables

The study sample represents a very active, healthy subgroup of Canadian older adults who are long-term members of seniors' centres. 29.6% of the sample exercised *outside* of exercise classes four times a week or more, most commonly for between 31 and 60 minutes (60.4% of the sample). Using a scale of 1 to 10, respondents rated their certainty that they would maintain an active lifestyle (i.e., exercise for at least 30 minutes on most days of the week for the next six months) as 8.03 on average. This implies that participants are quite confident that they will continue living actively.

The most common physical activity engaged in outside of structured exercise classes is walking (n=111; 65.7%), followed by home exercises (n=47; 27.8%) and Tai Chi or yoga (n=26; 15.4%). **Table 3** lists "outside exercise class" activities by proportion of the sample that listed each option. Activity types were presented in surveys as a checklist, where respondents chose from the options all applicable activities. Since most participants chose more than one option, total sample size will not add up to 169. Italicized text in the table represents items that participants added by hand, under the "Other" option.

Table 3: Types of physical activity engaged in outside exercise classes

Activity	n	% of sample
Walking	111	65.68
Home exercises	47	27.81
Tai Chi or yoga	26	15.38
Swimming	25	14.79
Dance	21	12.43
Bicycling	16	9.47
Weight training	13	7.69
Jogging/running	12	7.10
Organized sports	5	2.96
<i>Gardening</i>	4	2.37
Other (unspecified)	2	1.19
<i>Dog walking</i>	1	.59
<i>Vacuuming</i>	1	.59
<i>Gym</i>	1	.59
<i>Golf</i>	1	.59
<i>Stretching</i>	1	.59
<i>Ping pong</i>	1	.59

Note: Sample size does not add up to 169 since most participants chose more than one option.

Most participants (n=137; 81.1%) rated their physical health as either “good”, “very good”, or “excellent” compared to others of their age group. Only 9.5% of the sample said a long-term physical condition, mental condition, or health problem *often* reduced the amount or type of activity they can do at home (50.3% answered “never”), and 8.9% encountered similar limitations outside the home (52.7% responded “never”). The majority of respondents (n=75; 44.4%) have been members of a seniors’ centre for more than five years.

All respondents filled in answers to the survey item, “Older adults should engage in physical activity ___ minutes per day on ___ days per week”. Participants believed older adults should spend an average 41.21 minutes engaged in physical activity on an average of 4.89 days per week. This is in line with the Government of Canada’s physical activity recommendations for older

adults, which suggests accumulating 30 to 60 minutes of moderate physical activity on most days of the week (Public Health Agency of Canada, n.d.).

Exercise class variables

Of the participants not currently engaged in structured exercise classes (n=76), 51.3% were not interested in participating in classes. About a third of the sample (34.2%) was interested in starting to attend exercise classes, and 14.5% weren't sure whether they were interested or not. The following table displays types of exercise classes participants would be interested in attending, in descending order of sample proportion choosing each from a checklist (thus, total sample size will not add to 169). Italicized table text represents items participants added by hand – that is, items that were not present on the survey, and were written under the “Other” option. Tai Chi or yoga was the most commonly chosen type of class (n=19; 11.24%), followed by the “Not interested in any” option (n=14; 8.28%).

Table 4: Types of exercise classes non-class participants would like to attend

Type of class	n	% of sample
Tai Chi or yoga	19	11.24
Not interested in any	14	8.28
Aquafit	13	7.69
Strength/weight training	13	7.69
Aerobic fitness	11	6.50
Dance	9	5.33
Other (unspecified)	5	2.96
<i>Osteofit</i>	2	1.18
<i>Low impact</i>	2	1.18
<i>Walking</i>	2	1.18
<i>Team sports</i>	1	.59
<i>Chair exercise</i>	1	.59
<i>Cardio with trainer</i>	1	.59

Note: Sample size does not add up to 169 since most participants chose more than one option.

Non-class participants were asked to rate on a scale of 1 (“not important”) to 10 (“very important”), “If you were to attend exercise classes, how important would it be to you to attend exercise classes with others of your cultural background?” Across non-class respondents, the mean rating was 5.61, although the mode was 1 (22.4% of non-class older adults rated this item as 1, or “not important”).

To measure outcome-expectancy values, respondents in the non-class survey group were presented with two similar items. First, “If you were to attend exercise classes, how important to you would be the following possible outcomes of exercise classes?”, from one (“not important”) to five (“very important”).

Second, “If you were to attend exercise classes, how likely is it that you would attain each of the following outcomes?”, from one (“unlikely”) to five (“likely”).

Table 5 presents the seven survey items for the importance and the likelihood questions, ranked by mean score from highest to lowest.

Table 5: Perceived importance and likelihood of exercise class outcomes for non-class participants

Survey item: Importance	Mean score	Rank	Survey item: Likelihood	Mean score	Rank
Better general health	4.00	1	Better general health	3.88	1
Increased physical fitness	3.96	2	Stress reduction	3.65	2
Increased mental health	3.72	3	Increased physical fitness	3.65	2
Managing chronic illnesses	3.58	4	Increased mental health	3.43	3
Stress reduction	3.54	5	Social interaction	3.29	4
Social interaction	3.50	6	Managing chronic illnesses	3.23	5
Weight loss	3.14	7	Weight loss	3.04	6

Better general health was seen as both most important and most likely to occur for participants if they were to take part in exercise classes in the future,

and weight loss was perceived as both least important and least likely to occur. All other outcome items did not match in rank order across importance and likelihood categories. For instance, stress reduction was not perceived to be very important and ranked five out of seven for importance (mean score: 3.54 out of 5), but it was perceived to be a likely outcome of exercise classes and ranked second out of seven for likelihood (mean score: 3.65 out of 5).

Importance and likelihood scores were multiplied to create outcome-expectancy values for each of the seven potential outcomes of participating in exercise classes. Thus, outcome-expectancy scores range from 1 to 25. **Table 6** presents mean outcome-expectancy values for the seven items listed in the survey, for non-class participants.

Table 6: Mean outcome-expectancy values (OEV) for non-class participants

Potential outcome of exercise class	Mean OEV	Rank
Better general health	16.58	1
Increased physical fitness	15.77	2
Stress reduction	14.29	3
Increased mental health	14.18	4
Managing chronic illnesses	13.16	5
Social interaction	12.61	6
Weight loss	11.27	7

Given that these values are based on importance and likelihood scores, they rank similarly to the importance and likelihood ratings presented separately. Outcome-expectancy values were computed to be used in bivariate analyses, which will be presented later.

Study participants in the exercise class group selected from a list the types of classes they were currently attending. **Table 7** lists exercise class participation

by proportion of class respondents attending each type. Italicized table text represents items added by participants by hand, under the “Other” option. Aerobic fitness, Tai Chi or yoga, and strength or weight training were the three most attended types of classes (n=28, 16.57%; n=27, 15.98%; n=26, 15.38%, respectively).

Table 7: Types of exercise classes attended by class participants

Type of class	n	% of sample
Aerobic fitness	28	16.57
Tai Chi or yoga	27	15.98
Strength/weight training	26	15.38
Other (unspecified)	16	9.45
Dance	13	7.69
Aquafit	7	4.14
<i>Better Backs & Balance</i>	5	2.96
<i>Joint Works/Range of movement</i>	4	2.37
<i>Ping Pong</i>	3	1.78
<i>Gentle Fit</i>	1	.59
<i>Ease into Fitness</i>	1	.59

Note: Sample size does not add up to 169 since most participants chose more than one option.

51.6% (n=48) of class participants had been taking part in exercise classes for more than five years, and 23.7% (n=22) had been attending for between three and five years. The mode for this survey item was five, which corresponds to “More than 5 years”. Older adult participants appear to attend classes frequently. 22.6% of exercise class respondents participated in classes four times a week or more, 24.7% participated three times a week, and 29% attended twice weekly.

Outcome-expectancy values were obtained via two survey items, similar to those answered by non-class participants. Importance of class outcomes was measured with the question, “Please think about your reasons for participating in

exercise classes. How important to you are the following possible outcomes of exercise classes?”. Likelihood of achieving certain outcomes through attending exercise classes was measured with the item, “How likely is it that you will attain each of the following outcomes from the exercise class(es) you are currently taking?” Each of these items were rated on a scale of one (unimportant or unlikely) to five (very important or likely). **Table 8** presents the seven survey items for the importance and the likelihood questions, ranked by mean score from highest to lowest.

Table 8: Perceived importance and likelihood of exercise class outcomes for class participants

Survey item: Importance	Mean score	Rank	Survey item: Likelihood	Mean score	Rank
Increased physical fitness	4.60	1	Better general health	4.39	1
Better general health	4.54	2	Increased physical fitness	4.29	2
Increased mental health	4.32	3	Stress reduction	4.18	3
Stress reduction	4.14	4	Increased mental health	3.93	4
Managing chronic illnesses	3.83	5	Social interaction	3.74	5
Social interaction	3.78	6	Managing chronic illnesses	3.47	6
Weight loss	3.59	7	Weight loss	3.21	7

It is interesting to note that mean scores of importance and likelihood were higher for class participants compared to non-class participants. Similar to non-class participants, weight loss was seen as least important and least likely to be achieved by attending exercise classes. Predictably, increased physical fitness and better general health were the two most important and two most likely outcomes for participants enrolled in exercise classes.

Outcome-expectancy values were calculated for these participants in the same manner as for the non-class group, with possible scores ranging from 1 to 25. **Table 9** lists potential outcomes of exercise classes for the group of

participants currently enrolled in classes, ranked from highest to lowest score.

Table 9: Mean outcome-expectancy values (OEV) for class participants

Potential outcome of exercise class	Mean OEV	Rank
Better general health	20.48	1
Increased physical fitness	20.06	2
Stress reduction	18.10	3
Increased mental health	17.55	4
Social interaction	14.87	5
Managing chronic illnesses	14.71	6
Weight loss	12.40	7

Barriers to attending exercise classes

All participants were asked to choose from a list up to three barriers to attending exercise classes. Across all participants, the most commonly reported barrier to attending exercise classes was bad weather (n=47; 27.81%), followed by “no barriers” (n=43; 25.44%), and “classes scheduled at inconvenient times” (n=34; 20.12%). Data were collected over a ten-month period from May to February, covering Spring, Summer, Fall, and Winter. It is possible that weather conditions at the time of data collection influenced participants’ likelihood of choosing “bad weather” as a barrier. Skewed results are not likely, however, given that all seasons were represented. The following table lists barriers by proportion of the sample that chose each. *Italicized table text represents items added by participants by hand on the survey forms.*

Table 10: Barriers selected by participants

Barrier	n	% of sample
Bad weather	47	27.81
No barriers	43	25.44
Classes scheduled at inconvenient times	34	20.12
Health issues	31	18.34
Get enough exercise elsewhere	28	16.57
Lack of time	25	14.79
Cost of classes	23	13.61
Family responsibilities	21	12.43
Inconvenient location	13	7.69
No transportation	12	7.10
Nobody to go with	6	3.55
Other (unspecified)	3	1.78
<i>No motivation</i>	2	1.18
<i>Don't like gyms</i>	1	.59
<i>No suitable class for interest</i>	1	.59
<i>Laziness</i>	1	.59

Note: Sample size does not add up to 169 since most participants chose more than one option.

Benefits of attending exercise classes

Participants chose from a list up to three benefits of attending exercise classes (hypothetically, for those not attending classes) that applied most to them. Not surprisingly, physical fitness was the most commonly listed benefit of engaging in exercise classes (n=135; 79.88%), followed by muscle strength (n=80; 47.33%) and social interaction (34.91%). The following table lists benefits by proportion of the sample that chose each.

Table 11: Benefits selected by participants

Benefit	n	% of sample
Physical fitness	135	79.88
Muscle strength	80	47.34
Social interaction	59	34.91
Stress reduction	54	31.95
Mental health	50	29.59
Managing chronic illnesses	44	26.04
Weight loss	43	25.44
No benefits	2	1.18
Other (unspecified)	1	.59

Note: Sample size does not add up to 169 since most participants chose more than one option.

Cultural variables

Five survey items assessed cultural attitudes and acculturation. These apply mostly to ethnic minority participants, but results are reported here for both the minority group and the Caucasian group, for comparison purposes. Items were ranked on a scale of 1 (strongly disagree) to 10 (strongly agree).

Table 12: Cultural variables split by ethnic background

Ethnic minority	Mean score	Caucasian	Mean score
Being able to speak English is important to me	8.41	Being able to speak English is important to me	9.04
I like to celebrate Canadian holidays	8.92	I like to celebrate Canadian holidays	9.08
I identify myself as Canadian	9.24	I identify myself as Canadian	9.53
It is important to me to have Canadian friends	8.65	It is important to me to have Canadian friends	8.05
Many Canadian values are important to me	9.01	Many Canadian values are important to me	9.39

Not surprisingly, most acculturation variables are rated higher by Caucasians than ethnic minority participants. All variables were rated slightly higher by

Caucasians, with the exception of “It is important to me to have Canadian friends”, which was rated higher by ethnic minority participants. All differences are relatively small, at less than one point (on a 10-point scale) per item. Given that most data collection occurred at English-speaking seniors’ centres in the Lower Mainland and most ethnic minority participants had been living in Canada for many years, high acculturation scores would be expected.

Demographic variables

Basic demographic variables were assessed for all respondents. The two largest ethnic groups are Caucasian (n=101; 59.8%) and East Asian (n=55; 32.5%). Also represented were South Asian (n=2; 1.2%), Kenya (n=2; 1.2%), Philippines (n=1; 0.6%), and unspecified “Other” (n=8; 4.7%). Most participants were married (n=84; 49.7%) or widowed (n=54; 32.0%), followed by divorced (n=18; 10.7%), single (n=10; 5.9%), separated (n=2; 1.2%), and in a non-marital relationship (n=1; 0.6%). The sample of older adults had an average yearly income of \$25,000 to \$39,000, and 63.3% spoke English as their first language. The majority of participants have lived in Canada for a substantial amount of time: 41.4% were born in Canada, and 40.2% had lived in Canada for more than 20 years. 8.3% lived in Canada for between 16 and 20 years, 5.9% for between 11 and 15 years, 3.0% for between 6 and 10 years, and 1.2% for between 1 and 5 years. No participants chose the “Less than 1 year” option for this survey item. Most older adults (55%) had a high school education or less. 17.8% of the sample had a non-university post-secondary certificate, and 27.2% had

completed a university degree or certificate. **Table 13** presents a summary of demographic and descriptive results.

Table 13: Summary of demographic and descriptive results

Sample characteristics	Sample size	n = 169
	Exercise class group	55% of sample
	Non-class group	45% of sample
Demographics	Average age	72.6 years
	Sex	75.7% female
	Ethnicity	59.8% Caucasian; 32.5% East Asian
	Average income	\$25,000 - \$39,000
	Education	55% high school or less; 27.2% university degree or certificate; 17.8% non-university degree or certificate
	Marital status	49.7% married; 32.0% widowed; 10.7% divorced; 5.9% single; 1.2% separated; 0.6% in non-marital relationship
	Years lived in Canada	41.4% born in Canada; 40.2% have lived in Canada for 20+ years
Physical activity & health	Good, very good, or excellent health	81.1% of sample
	3 most common activities engaged in outside of classes	Walking, home exercise, Tai Chi or yoga
	3 most commonly attended exercise classes	Aerobic fitness, Tai Chi/yoga, strength & weight training
Barriers to exercise class attendance	3 most commonly reported barriers	Bad weather, 'no barriers', classes scheduled at inconvenient times
Motivators for exercise class attendance	3 most commonly reported motivators	Physical fitness, muscle strength, social interaction

Bivariate Analyses

Crosstabulations were generated for a wide range of dependent variables (DV's), capturing multiple dimensions of physical activity and related constructs,

consistent with the exploratory study framework. Ethnic background was used as the independent variable (IV), and all crosstabs were layered by survey group (i.e., exercise class group and non-class group). Results will be reported only for statistically significant associations. A significance level of $p < 0.1$ will be used as the scientific criterion, given the relatively small sample size and the exploratory nature of the study. However, $p < .05$, $p < .01$, and $p < .1$ will be reported where found.

All variables were recoded into dichotomies for bivariate analysis. Due to the relatively small sample size, this ensured each variable level contained enough data for appropriate statistical power. Chi-square, degrees of freedom, and Pearson R will be reported for each DV that showed a statistically significant association with the IV (ethnicity). Ethnicity was recoded into “Caucasian” or “Minority”, and other variables, most of which were rating scales, were divided into two subsets. For example, the ten-point self-efficacy scale was recoded into “high” (ratings 6 to 10) and “low” (ratings 1 to 5). Most other DV’s were inherently dichotomous, such as barriers and benefit variables that were coded “0” for an unchecked item and “1” for a checked item. Given that all bivariate analyses consisted of two-by-two tables and can be treated as interval variables, Pearson R correlations were used in addition to Chi Square values, which is the more traditional statistic. A summary of statistically significant bivariate results follows, with detailed results tables and descriptions presented in **Appendix B**.

Table 14 presents a summary of all statistically significant bivariate results, for both the class survey group and the non-class survey group. Where an

association between a particular variable and ethnicity was statistically significant for only one of the two survey groups, “NS” is used in the table to signify “non-statistically significant” for one group.

Participants chose from a list up to three barriers and up to three motivators for attending exercise classes that applied most to them. Responses were coded as “0” for an un-checked item, and “1” for a checked item, essentially translating into “no” or “doesn’t apply” and “yes” or “applies”, respectively.

Five of 11 potential barriers to attending exercise classes showed statistically significant associations with ethnicity for at least one survey group. “Bad weather” had the strongest association with ethnicity ($r = .33$ for non-class survey group; $r = .38$ for class survey group; $p < 0.05$); ethnic minority participants were more likely than Caucasians to choose this barrier. Three of eight motivators or benefits of exercise attendance were statistically significantly related to ethnicity, with “Muscle strength” showing the strongest association ($r = -.28$ for non-class participants; $r = -.20$ for class participants; $p < 0.05$). Caucasians were more likely than ethnic minority respondents to choose this benefit. Exercise-related self-efficacy and activity levels were moderately associated with ethnicity, but only for one survey group each. Three of seven perceived importance and five of seven perceived likelihood variables were associated with ethnicity. Of the importance variables, “Managing chronic illnesses” was most strongly associated with ethnic background – ethnic minority older adults rated this item as more important compared to Caucasians ($r = .22$ for non-class group; $r = .25$ for class group; $p < 0.1$). For the likelihood variables,

“Weight loss” was most strongly associated with ethnicity – ethnic minority participants, compared to Caucasians, reported higher likelihood ratings for achieving weight loss by attending exercise classes. When importance and likelihood scores were combined into an aggregate measure of outcome-expectancy values, two of seven variables showed statistically significant associations with ethnicity. Lastly, preference for cultural homogeneity was associated with ethnicity: ethnic minority participants rated the importance of exercising with others of the same cultural background as more important than did their Caucasian counterparts ($r = 0.23$ for both survey groups; $p < 0.05$).

Table 14: Summary of statistically significant bivariate results

Variable		Non-Class Group		Exercise Class Group	
		Chi-Square	Pearson R	Chi-Square	Pearson R
Barriers to attending exercise classes	Lack of time	2.94 *	-.20 *	NS	NS
	“No barrier” option	2.94 *	-.20 *	7.33 ***	-.28 ***
	No transportation	2.51 *	.20 *	4.11 **	.22 **
	Bad weather	6.95 ***	.33 ***	12.37 ****	.38 ****
	Inconvenient location	3.76 *	.24 *	NS	NS
Motivators for attending exercise classes	Social interaction	NS	NS	3.78 **	.21 **
	Muscle strength	5.24 **	-.28 **	3.38 ***	-.20 ***
	Mental health	NS	NS	2.77 *	.18 *
Activity levels	Self-efficacy	7.88 ***	-.34 ***	NS	NS
	Level of physical activity	2.06 *	-.17 *	NS	NS
Importance of exercise class outcomes	Social interaction	NS	NS	2.50 *	.17 *
	Stress reduction	2.11 *	-.09 *	NS	NS
	Managing chronic illnesses	3.15 *	.22 *	5.11 **	.25 **
Likelihood of exercise class outcomes	Physical fitness	3.56 *	.22 *	NS	NS
	Better general health	NS	NS	2.86 *	-.18 *
	Increased mental health	3.14 *	.22 *	NS	NS
	Stress reduction	3.12 *	.21 *	NS	NS
	Weight loss	NS	NS	5.31 **	.24 **
Outcome-expectancy values	Stress reduction	5.10 **	.29 **	NS	NS
	Increased mental health	6.91 ***	.32 ***	NS	NS
Cultural preferences	Importance of cultural homogeneity at exercise classes	4.66 **	.23 **	4.75 **	.23 **

Coding: Caucasian = 0; East Asian = 1

NS = Not statistically significant
df = 1 for all variables
* p < 0.1; ** p < 0.05; *** p < 0.01; **** p < 0.001

Multivariate Analyses

Given that the dependent variables for all analyses were dichotomous, logistic regression was used to test for statistically significant associations between ethnicity and various dependent variables, while controlling for basic demographic variables. Nine logistic regression analyses were conducted. For

each dependent variable, analyses were carried out separately for all survey participants, as well as for a split between class and non-class participants. The first three logistic regressions used as the dependent variable total physical activity, using all participants, only non-class participants, and only class participants. Next, the barrier variable and the motivator variable with the strongest association to ethnicity in bivariate analyses were used as dependent variables for regression analyses (“no barrier” option and “muscle strength”, respectively). Again, these regressions were run three times each, using all participants, only non-class participants, and only class participants.

The same independent variables, in the same blocks (models), were used for each logistic regression. Model 1 consists of the ethnic group variable, split into Caucasian and ethnic minority. Model 2 adds age, sex, and marital status (married versus not married), and Model 3 adds education (high school or less versus university certificate or degree) and income (low versus high). Model 4 introduces self-perceived health (poor versus good), as well as the frequency of activity limitation – a variable assessing activity restriction at home due to long-term physical or mental conditions (never, sometimes, or often). The survey also contained a similar item assessing activity limitation outside the home. Regression results did not differ significantly when using this variable instead of the at-home activity limitation variable.

Five of the nine logistic regression analyses showed statistically significant results. For the analyses using total physical activity as a dependent variable, results were not statistically significant for the regression using only non-class

participants. Out of the three regressions using the “no barrier” option as a dependent variable, results for the non-class group were not statistically significant. For the regressions with the “muscle strength” benefit DV, only the analysis using all participants was statistically significant – that is, both the non-class and the class analyses were not statistically significant. Summary tables of statistically significant regression results are presented below, followed by descriptions.

Table 15: Logistic regression results – all participants; total physical activity DV

Independent Variables	Model 1		Model 2		Model 3		Model 4	
	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Ethnic group (ref = Caucasian)	-.286	.751	-.302	.739	.036	1.037	-.032	.968
Age (ref = 51)			0.031	.970	-.018	.982	-.021	.979
Sex (ref = male)			-.020	.980	.231	1.260	.044	1.045
Marital status (ref = married)			-.109	.897	-.051	.951	-.117	.889
Education (ref = low)					1.317**	3.732**	1.417**	4.124**
Income (ref = low)					.444	1.560	.372	1.450
Self-perceived health (ref = poor)							.794	2.212
Activity limitation: Never (= ref)	--	--	--	--	--	--	--	--
Activity limitation: Sometimes							-.006	.994
Activity limitation: Often							1.600	
	Model chi-square: .443 (df = 1)		Model chi-square: 1.80 (df = 4)		Model chi-square: 9.982* (df = 6)		Model chi-square: 14.347* (df = 9)	
* p < 0.1	DV: Total Physical Activity							
** p < 0.05	(0 = Inactive, 1 = Active)							
*** p < 0.01								
**** p < 0.001								

Table 16: Logistic regression results – class participants; frequency of exercise class attendance DV

Independent Variables	Model 1		Model 2		Model 3		Model 4	
	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Ethnic group (ref = Caucasian)	1.001**	2.720**	.900*	2.459*	.905*	2.471*	1.131**	3.098**
Age (ref = 51)			-.063**	.939**	-.061**	.941**	-.055*	.946*
Sex (ref = male)			-.065	.938	-.055	.947	-.012	.988
Marital status (ref = married)			.006	1.006	.016	1.016	.001	1.001
Education (ref = low)					.097	1.102	.078	1.081
Income (ref = low)					-.091	.913	-.254	.775
Self-perceived health (ref = poor)							.071	1.073
Activity limitation: Never (= ref)	--	--	--	--	--	--	--	--
Activity limitation: Sometimes							-1.162**	.313**
Activity limitation: Often							-.059	.943
	Model chi-square: 5.498** (df = 1)		Model chi-square: 10.745** (df = 4)		Model chi-square: 10.810* (df = 6)		Model chi-square: 16.135* (df = 9)	
	* p < 0.1		DV: Frequency of exercise class attendance (0 = Frequent, 1 = Infrequent)					
	** p < 0.05							
	*** p < 0.01							
	**** p < 0.001							

Table 17: Logistic regression results – all participants; barrier DV

Independent Variables	Model 1		Model 2		Model 3		Model 4	
	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Ethnic group (ref = Caucasian)	-1.202***	.301***	-1.339***	.262***	-1.043**	.352**	-1.012**	.363**
Age (ref = 51)			.002	1.002	.008	1.008	.006	1.006
Sex (ref = male)			-.081	.922	.155	1.168	.024	1.024
Marital status (ref = married)			.485	1.624	.435	1.545	.187	1.206
Education (ref = low)					.569	1.767	.461	1.586
Income (ref = low)					.884**	2.420**	.856**	2.354**
Self-perceived health (ref = poor)							.611	1.843
Activity limitation: Never (= ref)	--	--	--	--	--	--	--	--
Activity limitation: Sometimes							-.441	.643
Activity limitation: Often							-1.441	.237
	Model chi-square: 9.513** (df = 1)		Model chi-square: 11.264** (df = 4)		Model chi-square: 19.170*** (df = 6)		Model chi-square: 24.006*** (df = 9)	
	* p < 0.1		DV: "No barrier" option (0 = Unselected, 1 = Selected)					
	** p < 0.05							
	*** p < 0.01							
	**** p < 0.001							

Table 18: Logistic regression results – class participants; barrier DV

Independent Variables	Model 1		Model 2		Model 3		Model 4	
	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Ethnic group (ref = Caucasian)	-1.297***	.273***	-1.397***	.247***	-1.091**	.336**	-1.269**	.281**
Age (ref = 51)			.026	1.027	.030	1.031	.025	1.025
Sex (ref = male)			-.091	.913	.098	1.103	-.282	.754
Marital status (ref = married)			.601	1.824	.450	1.568	.064	1.067
Education (ref = low)					.587	1.799	.558	1.747
Income (ref = low)					1.189**	3.284**	1.217**	3.377**
Self-perceived health (ref = poor)							1.936	6.932
Activity limitation: Never (= ref)	--	--	--	--	--	--	--	--
Activity limitation: Sometimes							.044	1.045
Activity limitation: Often							-.306	.737
	Model chi-square: 7.492*** (df = 1)		Model chi-square: 9.426** (df = 4)		Model chi-square: 16.828*** (df = 6)		Model chi-square: 26.810*** (df = 9)	
	* p < 0.1		DV: "No barrier" option (0 = Unselected, 1 = Selected)					
	** p < 0.05							
	*** p < 0.01							
	**** p < 0.001							

Table 19: Logistic regression results – all participants; benefit DV

Independent Variables	Model 1		Model 2		Model 3		Model 4	
	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Ethnic group (ref = Caucasian)	-.825***	.438***	-.803**	.448**	-.593*	.553*	-.605*	.546*
Age (ref = 51)			-.021	.980	-.015	.985	-.016	.985
Sex (ref = male)			.831*	2.296*	1.032*	2.806*	1.081**	2.947**
Marital status (ref = married)			.408	1.504	.408	1.504	.450	1.569
Education (ref = low)					.490	1.632	.491	1.634
Income (ref = low)					.630	1.878	.647*	1.911*
Self-perceived health (ref = poor)							-.216	.806
Activity limitation: Never (= ref)	--	--	--	--	--	--	--	--
Activity limitation: Sometimes							.176	1.192
Activity limitation: Often							-.160	.852
	Model chi-square: 6.691*** (df = 1)		Model chi-square: 13.532*** (df = 4)		Model chi-square: 18.965*** (df = 6)		Model chi-square: 19.621** (df = 9)	
	* p < 0.1		DV: "Muscle strength" benefit (0 = Unselected, 1 = Selected)					
	** p < 0.05							
	*** p < 0.01							
	**** p < 0.001							

In the first logistic regression (**Table 15**) – using the total physical activity variable as a DV and including all participants – the first two models were not statistically significant. Model 3 (chi-square=9.982; df=6; $p < .1$) consists of ethnic group, age, sex, marital status, education, and income variables. Education was the only variable in Model 3 showing a statistically significant association with frequency of engaging in PA. The likelihood of reporting being active (i.e. exercising three times a week or more) versus inactive is increased by a factor of 3.732 for older adults who hold a university certificate or degree versus those who have high school education or less, controlling for all other variables in the model ($B=1.317$; $OR=3.732$; $p < .05$). Model 4 (chi-square=14.347; df=9; $p < .1$) adds self-perceived physical health and activity limitation variables. Again, the only variable showing a statistically significant relationship with the DV of total PA is education. The association strengthened from Model 3 to Model 4: The likelihood of reporting being active versus inactive is increased by a factor of 4.124 for participants with higher versus lower education ($B=1.417$; $OR=4.124$; $p < .05$).

Table 16 displays logistic regression results for exercise class attendees only, using frequency of exercise class attendance as the DV. Statistically significant results were found in each of the four models. Model 1 (chi-square=5.498; df=1; $p < .05$) contains the ethnic group variable. The likelihood of attending exercise classes frequently (i.e. three times a week or more) is increased by a factor of 2.720 for ethnic minority versus Caucasian participants ($B=1.001$; $OR=2.720$; $p < .05$). This association remains statistically significant

throughout all models. Model 2 (chi-square=10.745; df=4; $p<.05$) adds age, sex, and marital status variables. The likelihood of attending exercise classes regularly is decreased by a factor of .939 for each year increase in age ($B=-.063$; $OR=.939$; $p<.05$). Associations between exercise class attendance and both sex and marital status were not statistically significant. Model 3 (chi-square=10.810; df=6; $p<.05$) adds income and education variables, which did not show statistically associations with the DV. Associations between the DV and ethnic group as well as age increased in strength slightly from Model 2 to Model 3 ($B=.905$; $OR=2.471$; $p<.05$, and $B=-.061$; $OR=.941$; $p<.05$, respectively). The perceived physical health variable added in Model 4 (chi-square=16.135; df=9; $p<.05$) did not show a statistically significant relationship to frequency of exercise class attendance.

The likelihood of reporting frequent versus infrequent class attendance is decreased by a factor of .313 for older adults reporting sometimes experiencing activity limitations at home, compared to those who report no activity limitations at home ($B=-1.162$; $OR=.313$; $p<.05$). Interestingly, the association between reporting *often* experiencing activity limitations and the DV was not statistically significant. This could have been due to the small number of participants choosing the “often” option, and thus low statistical power. The association between ethnic group and exercise class attendance remained statistically significant throughout all models, and increased in strength slightly from Model 3 to Model 4 ($B=1.131$; $OR=3.098$; $p<.05$ in Model 4).

In the logistic regression analysis including all participants and using the barrier dependent variable (**Table 17**), once again the ethnic group variable remains statistically significantly associated with the DV throughout, controlling for all other variables in the models. In Model 1 (chi-square=9.513; df=1; $p<.05$), the likelihood of selecting (versus not selecting) the “no barriers” option from a list of potential barriers to attending exercise classes is decreased by a factor of .301 for ethnic minority participants compared to Caucasians ($B=-1.202$; $OR=.301$; $p<.01$). This relationship increased in strength slightly from Model 1 to Model 2 ($B=-1.339$; $OR=.262$; $p<.01$). No other variables in Model 2 showed statistically significant associations with choosing the “no barrier” option (model chi-square=11.264; df=4; $p<.05$). In Model 3, only ethnic group and income are statistically significantly associated with the DV ($B=-1.043$; $OR=.352$; $p<.05$ for ethnic group). The likelihood of selecting the “no barriers” option (versus leaving it blank in the survey) is increased by a factor of 2.420 for older adults reporting high versus low income ($B=.884$; $OR=2.420$; $p<.05$). This association remains statistically significant in Model 4 ($B=.856$; $OR=2.354$; $p<.05$, model chi-square=24.006; df=9; $p<.01$). In Model 3, the likelihood of choosing the “no barriers” option is decreased by a factor of .352 for ethnic minority older versus Caucasian older adults ($B=-1.043$; $OR=.352$; $p<.05$). This association also remains statistically significant in Model 4 ($B=-1.012$; $OR=.363$; $p<.05$).

Table 18 displays logistic regression results for class participants only, with the “no barrier” option as the dependent variable. Results are similar to those including all participants: The association between ethnic background and the

likelihood of choosing the “no barriers” option remains statistically significant even when controlling for all other variables in the models, and income is positively associated with choosing the “no barriers” option in both models that include this variable.

The last logistic regression analysis that showed statistically significant results included all participants and used the “muscle strength” benefit dependent variable (**Table 19**). In Model 1 (chi-square=6.691; df=1; $p<.01$), the likelihood of selecting “muscle strength” from the list of potential benefits to attending exercise classes is decreased by a factor of .438 for ethnic minority participants compared to Caucasian participants ($B=-.825$; $OR=.438$, $p<.01$). This association remains statistically significant in Model 2, and increases very slightly in strength ($B=-.803$; $OR=.448$; $p<.05$). Model 2 (chi-square=13.532; df=4; $p<.01$) adds age, sex, and marital status variables. Only sex showed a statistically significant relationship with the DV. The likelihood of choosing “muscle strength” as a benefit of exercise classes (versus not selecting this benefit from the list) is increased by a factor of 2.296 for females compared to males ($B=.831$; $OR=2.296$; $p<.1$). Model 3 (chi-square=18.965; df=6; $p<.01$) introduces education and income variables, which are not statistically significantly associated with the DV. Ethnic group and sex remain statistically significantly associated with choosing the “muscle strength” benefit of exercise class attendance ($B=-.593$; $OR=.553$; $p<.1$, and $B=1.032$; $OR=2.806$; $p<.1$, respectively). In Model 4 (chi-square=19.621; df=9; $p<.05$), the association between choosing the “muscle strength” benefit and income becomes statistically

significant. The likelihood of choosing “muscle strength” versus not selecting this benefit from the list is increased by a factor of 1.911 for older adults with higher versus lower incomes ($B=.647$; $OR=1.911$; $p<.1$). The likelihood of choosing “muscle strength” remains decreased (by a factor of .546) for ethnic minority participants compared to their Caucasian counterparts ($B=-.605$; $OR=.546$; $p<.1$), and increased (by a factor of 2.947) for females versus males ($B=1.081$; $OR=2.947$; $p<.05$).

Table 20 provides a summary of all statistically significant multivariate results.

Table 20: Summary of statistically significant multivariate results

		All Participants							
		Model 1		Model 2		Model 3		Model 4	
Dependent Variables	Independent Variables	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Total physical activity	Education (ref = low)					1.317**	3.732**	1.417**	4.124**
						Model chi-square: 9.982* (df = 6)		Model chi-square: 14.347* (df = 9)	
"No barriers" option	Ethnic group (ref = Caucasian)	-1.202***	.301***	-1.339***	.262***	-1.043**	.352**	-1.012**	.363**
	Income (ref = low)					.884**	2.420**	.856**	2.354**
		Model chi-square: 9.513** (df = 1)		Model chi-square: 11.264** (df = 4)		Model chi-square: 19.170*** (df = 6)		Model chi-square: 24.006*** (df = 9)	
"Muscle strength" benefit	Ethnic group (ref = Caucasian)	-.825***	.438***	-.803**	.448**	-.593*	.553*	-.605*	.546*
	Sex (ref = male)			.831*	2.296*	1.032*	2.806*	1.081**	2.947**
	Income (ref = low)							.647*	1.911*
		Model chi-square: 6.691*** (df = 1)		Model chi-square: 13.532*** (df = 4)		Model chi-square: 18.965*** (df = 6)		Model chi-square: 19.621*** (df = 9)	
* p < 0.1; ** p < 0.05; *** p < 0.01; **** p < 0.001									

		Class Participants							
		Model 1		Model 2		Model 3		Model 4	
Dependent Variables	Independent Variables	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Frequency of exercise class attendance	Ethnic group (ref = <i>Caucasian</i>)	1.001**	2.720**	.900*	2.459*	.905*	2.471*	1.131**	3.098**
	Age (ref = 51)			-.063**	.939**	-.061**	.941**	-.055*	.946*
	Activity limitation: Sometimes (ref = <i>never</i>)							-1.162**	.313**
		Model chi-square: 5.498** (df = 1)		Model chi-square: 10.745* (df = 4)		Model chi-square: 10.810* (df = 6)		Model chi-square: 16.135* (df = 9)	
"No barrier" option	Ethnic group (ref = <i>Caucasian</i>)	-1.297***	.273***	-1.397***	.247***	-1.091**	.336**	-1.269**	.281**
	Income (ref = <i>low</i>)					1.189**	3.284**	1.217**	3.377**
		Model chi-square: 7.492*** (df = 1)		Model chi-square: 9.426** (df = 4)		Model chi-square: 16.828*** (df = 6)		Model chi-square: 26.810*** (df = 9)	

* p < 0.1; ** p < 0.05; *** p < 0.01; **** p < 0.001

Chapter 5: Discussion

The purpose of this study was to use a quantitative, exploratory framework to investigate physical activity and exercise class attendance in older adults, focusing on potential differences between ethnic minority and Caucasian participants. Survey data were analyzed using both bivariate and multivariate methods, which led to many statistically significant results that addressed the study's research questions.

Research Question 1

The study's main research question is, "*How do perceived barriers and motivators to exercise class attendance vary by culture?*" Bivariate analyses (i.e., crosstabulations of dependent and independent variables) resulted in numerous statistically significant differences between ethnic minority participants – the majority of whom were East Asian – and Caucasian participants. Out of 12 potential barriers listed in the surveys, 5 showed statistically significant associations with ethnicity. Compared to their ethnic minority counterparts, Caucasian older adults were more likely to choose "lack of time" as a barrier, as well as the "no barriers" option. In contrast, ethnic minority respondents were more likely than Caucasians to select "no transportation", "bad weather", and "inconvenient location" as barriers – all commonly reported in existing literature (e.g., Belza et al., 2004; Whaley & Ebbeck, 1997). The "no barrier" option had the strongest association with ethnicity. Only one barrier was chosen more often by Caucasians than by ethnic minority seniors' centre members, and Caucasians chose "no barriers" more often. This implies that ethnic minority seniors may be

experiencing more barriers than Caucasians to regularly attending exercise classes.

Three of nine potential motivators (or benefits) of exercise class attendance showed statistically significant associations with the dependent variable of ethnicity: social interaction, muscle strength, and mental health. Ethnic minority participants were less likely than Caucasians to choose “muscle strength”, and more likely than Caucasians to choose “social interaction” and “mental health”. Wilcox et al. (2003) found in their study of Korean Americans that adherence to an exercise program was associated with social aspects of group cohesion more than interest in the exercise activity itself. Perhaps the importance of mental health as a result of physical activity stems from the frequency with which many East Asians engage in activities such as Tai Chi or yoga – practices that emphasize the connection between mind and body. “Muscle strength” showed the strongest association with ethnicity. We can see from these results that motivators and barriers to attending exercise classes do vary across ethnic background, since particular ethnic groups were more or less likely to choose certain items on the survey.

To address the secondary question posed by the first research issue (“*Do these potential differences remain statistically significant when controlling for basic demographic variables?*”), multivariate analyses were utilized. The “no barriers” option and the “muscle strength” benefit were used as dependent variables in logistic regression analyses. Even when controlling for all variables in the model (i.e., age, sex, marital status, education, income, self-perceived

health, and activity limitation), the association between barrier and motivator variables remained statistically significant. Logistic regression results mirrored bivariate results, in that the likelihood of selecting “no barriers” (versus leaving this option blank on the survey) was decreased for ethnic minority older adults compared to Caucasians in the final logistic regression model. This points toward Caucasians choosing the “no barriers” option more often, suggesting that ethnic minority older adults may experience a greater number of barriers to attending exercise classes than do their Caucasian counterparts. These findings were similar for the regression including all participants and the regression using only exercise class participants. The analysis including only non-class participants did not show statistically significant results.

For the “muscle strength” motivator variable, only the regression using all participants displayed statistically significant results (both the class and non-class analyses were not statistically significant). Again, even when controlling for demographic and health variables, the association between ethnicity and selecting the “muscle strength” benefit was statistically significant. The likelihood of selecting “muscle strength” from the list of barriers (versus not selecting this item) was decreased for ethnic minority participants compared to Caucasian older adults in the final model. The fact that the associations between ethnicity and barriers as well as motivators remain statistically significant after controlling for seven demographic and health variables implies that ethnic background plays a role in the quantitative differences found between ethnic groups.

Research Question 2

The study's second research question is, "*Is there a disparity in physical activity levels between ethnic minority participants and Caucasian participants?*", with a secondary question: "*Does this potential disparity remain statistically significant when controlling for basic demographic variables?*" Results in this area were contradictory and thus ambiguous.

In bivariate analyses, there was a small-to-moderate association between ethnicity and total physical activity. For the non-class group, Caucasian participants were more likely to exercise frequently (i.e., three times a week or more) compared to ethnic minority older adults. However, this relationship was not statistically significant for the class group. When a different activity level cut-off point was used – coding four times a week or more as "active" (instead of three times a week or more), more closely approximating Canadian government recommendations – results were also not statistically significant.

Multivariate analyses painted a slightly different picture. Using frequency of total physical activity as a dependent variable and including all participants in the analysis, there was no statistically significant association between ethnicity and PA. However, when running logistic regression analyses on class participants only, with frequency of exercise class attendance as the DV, the association between ethnicity and PA remains statistically significant even when controlling for all other variables in the model. The relationship does not match bivariate results: The likelihood of reporting being active versus inactive is increased by a factor of 3.098 for ethnic minority older adults compared to Caucasians.

In answer to the second research question and based on results from the current study, there is insufficient evidence to conclude that there is a disparity in activity levels between ethnic minority and Caucasian older adults. Bivariate analyses found activity levels to be slightly higher among Caucasians (but only for the non-class survey group), and multivariate results found no statistically significant associations among ethnicity and PA, and that ethnic minority respondents attended exercise classes more frequently than Caucasians.

Contrary to results from American studies, there is no clear trend in Canada for immigrant seniors to display lower levels of activity than Caucasians. Some studies do find that ethnic minority older adults in Canada are less active than the majority culture (e.g., Pérez, 2002). If this is the case, given that most participants in the current study attended English-speaking seniors' centres and had lived in Canada for a considerable amount of time, perhaps acculturation has played a role in "levelling" physical activity levels across ethnic groups. Other studies, however, find no differences in activity levels between ethnic groups, and one study (Turcotte & Schellenberg, 2007) found long-term immigrant seniors in Canada to be slightly more likely to be active than Canadian-born older adults. The ambiguity present in the existing literature regarding disparities in physical activity levels is represented in the current study's results. While no statistically significant differences in total physical activity level between ethnic groups were found, ethnic minority participants currently enrolled in exercise classes were more likely to attend classes regularly compared to Caucasian older adults. It is interesting to note that ethnic minority older adults were less

likely than Caucasian participants to choose the “no barriers” option, but nonetheless attended exercise classes more frequently than Caucasians.

Research Question 3

The third main research question is, “*Do potential differences between ethnic groups in barriers, motivators, and activity levels vary by survey group (i.e., non-class versus class)?*” No interaction effects were found – that is, a positive association between ethnicity and a certain variable for one survey group and a negative association between ethnicity and the same variable for the other survey group. Many associations showed statistically significant results for one survey group but not the other (both in bivariate and multivariate analyses. Where associations were statistically significant for both survey groups, the strength of associations varied only slightly between survey groups.

Supplemental Research Points

Additional associations were found via bivariate analyses that did not relate directly to the study’s main research questions, but provided insight into the area of older adults, physical activity, and exercise class attendance.

Exercise-related self-efficacy

The association between level of confidence that one will maintain an active lifestyle over the next six months and ethnicity was not statistically significant for the class survey group. For the non-class survey group, ethnic minority participants were less likely to report a high level of confidence that they will exercise most days of the week for the next six months compared to Caucasians.

Outcome-expectancy values

Outcome-expectancy values – a construct from social cognitive theory – were analyzed to broaden the scope of the study’s investigation of barriers and motivators to exercise class attendance. Ethnic minority participants gave higher importance ratings for social interaction and managing chronic illnesses compared to Caucasians, and Caucasians gave higher importance ratings for stress reduction. These findings map onto the existing knowledge base in that Caucasians more often cite stress reduction as a motivator compared to ethnic minority groups (Wilcox et al., 2005), and social interaction is often mentioned by East Asian participants as a benefit of structured exercise classes. In one study, for instance, Korean participants’ adherence to an exercise group program was associated more with social aspects of group cohesion than interest in the activity itself (Kang et al., 2007).

Ethnic minority older adults gave higher likelihood ratings for physical fitness, increased mental health, stress reduction, and weight loss compared to Caucasians, and Caucasians gave higher likelihood ratings for general health. When importance and likelihood ratings were combined into a single measure of outcome-expectancy values, ethnic minority older adults were more likely than their Caucasian counterparts to rate the importance of stress reduction and increased mental health as high. There may be preliminary support for the notion that higher outcome-expectancy values lead to higher levels of physical activity: Ethnic minority participants in the class survey group were more likely than Caucasians to attend exercise classes frequently (when controlling for a number of demographic and physical health variables). However, when using

total physical activity and all participants in analyses, results were not statistically significant.

Preference for cultural homogeneity

In line with existing literature, ethnic minority respondents rated exercising with others of the same cultural background as more important than did Caucasians. Cultural homogeneity, then, is of greater salience to ethnic minority participants than to Caucasian older adults. This finding is well represented in the existing literature, with a wide range of ethnic groups (e.g., Tongans living in New Zealand, American Indian, Alaska Native, Korean, Latino) expressing a similar preference for homogeneity (Kolt, Paterson, & Cheung, 2006; Melillo et al., 2001).

Analytical Typology

Descriptive results concerning barriers and motivators can be interpreted using the classification system presented in the literature review, classifying barriers and motivators into culturally specific versus cross-cultural, and person-based versus program-based. This analytical framework used to discuss existing literature concerning older adults' motivators and barriers to attending structured exercise classes can be applied to the current study's results. The survey focuses primarily on cross-cultural program-based or person-based barriers and motivators, rather than culturally specific factors. Although a cross-cultural factor must apply to groups of all ethnic backgrounds, its frequency of occurrence or the strength of its association with other factors may vary by culture.

From the 16 potential barriers to attending exercise classes (12 provided in the survey, 4 added by participants), cross-cultural person-based barriers included “health issues” (the most commonly selected barrier in this category, selected by 18.34% of the total sample), “get enough exercise elsewhere”, “lack of time”, “family responsibilities”, “nobody to go with”, “no motivation”, “don’t like gyms”, and “laziness”.

Cross-cultural program-based barriers consisted of “classes scheduled at inconvenient times”, “cost of classes”, “inconvenient location”, “no transportation”, and “no suitable class for interest”. The “bad weather” and “no barrier” options did not readily fit into the framework, and the “other (unspecified)” option was not included in this classification.

The survey provided a list of nine potential motivators to attending exercise classes from which participants chose up to three that applied most to them. Two options were not included in the classification – “no benefits” and “other (unspecified)”. Participants did not add additional motivators by hand. All but one motivator were classified as cross-cultural person-based motivators: “physical fitness”, “managing chronic illnesses”, “stress reduction”, “weight loss”, “muscle strength”, and “mental health”.

“Social interaction” was the cross-cultural program-based motivator represented in this study. **Table 21** classifies descriptive results regarding barriers and motivators into the typology used for the literature review, displaying the percentage of the total sample that selected each option.

Table 21: Analytical typology and descriptive results

	Barriers				Motivators			
	Person-based		Program-based		Person-based		Program-based	
Culturally specific	<i>NOT INCLUDED IN THE CURRENT STUDY</i>							
		% of sample		% of sample		% of sample		% of sample
Cross-cultural	Health issues	18.34	Classes scheduled at inconvenient times	20.12	Physical fitness	79.88	Social interaction	34.91
	Get enough exercise elsewhere	16.57	Cost of classes	13.61	Muscle strength	47.34		
	Lack of time	14.79	Inconvenient location	7.69	Stress reduction	31.95		
	Family responsibilities	12.43	No transportation	7.10	Mental health	29.59		
	Nobody to go with	3.55	No suitable class for interest	.59	Managing chronic illnesses	26.04		
	No motivation	1.18			Weight loss	25.44		
	Don't like gyms	.59						
	Laziness	.59						

Links to Theoretical Perspectives

Adopting the broad ecological paradigm of differentiating between micro-, meso-, and macro-level contexts, the interdisciplinary model of culture and physical activity was created for this study to integrate applicable constructs from several theoretical perspectives. At the micro level, personal/individual variables relate to the health belief model. *Perceived benefits* and *perceived barriers* are health belief model constructs that apply directly to the aim of the study. Results showed that even when controlling for demographic and physical health variables, perceived benefits and barriers of attending exercise classes varied by ethnic background. This implies that constructs inherent in cultures (rather than

intervening variables) – perhaps through networks of knowledge – directly influence older adults’ perceived barriers and motivators to exercise.

Self-efficacy is also an individual-level health belief model construct investigated by the current study (and shared by the social cognitive perspective). Results showed that Caucasian older adults were more certain than their ethnic minority counterparts that they would maintain an active lifestyle for the next six months. Self-efficacy was not included in multivariate analyses in the current study. Future research based upon the health belief model could focus on minimizing the effects of extraneous variables, while investigating reasons for this potential disparity in exercise-related self-efficacy across ethnic groups.

The health belief model assumes that individuals hold a certain level of knowledge related to health behaviours, with conscious processing of all health-related decisions. This concept maps well onto the notion of cultures as networks of knowledge, but may not include other, more intrinsic aspects of culture such as unconscious biases or scripts.

At the meso level of the interdisciplinary model of culture and physical activity, social cognitive theory encompasses interpersonal environment and physical environment variables. The study included several constructs from the social-cognitive theory. *Outcome expectancies* are the values one places on particular outcomes. In the study, outcome expectancies were framed as perceived importance of various potential outcomes of attending exercise classes. *Outcome expectations* – perceived anticipatory outcomes of particular

behaviours – manifested as survey items addressing participants' expectations about the likelihood of achieving certain outcomes through exercise class attendance. Perceived importance and perceived likelihood ratings varied by ethnic background. Compared to Caucasians, ethnic minority older adults reported higher importance ratings for social interaction and managing chronic illnesses, and higher likelihood ratings for physical fitness, increased mental health, stress reduction, and weight loss. Caucasians reported higher importance ratings for stress reduction, and higher likelihood ratings for better general health. Social cognitive theory states that outcome expectations are learned through previous experience, emotional or physical responses, and observation – constructs that could potentially vary by cultural background.

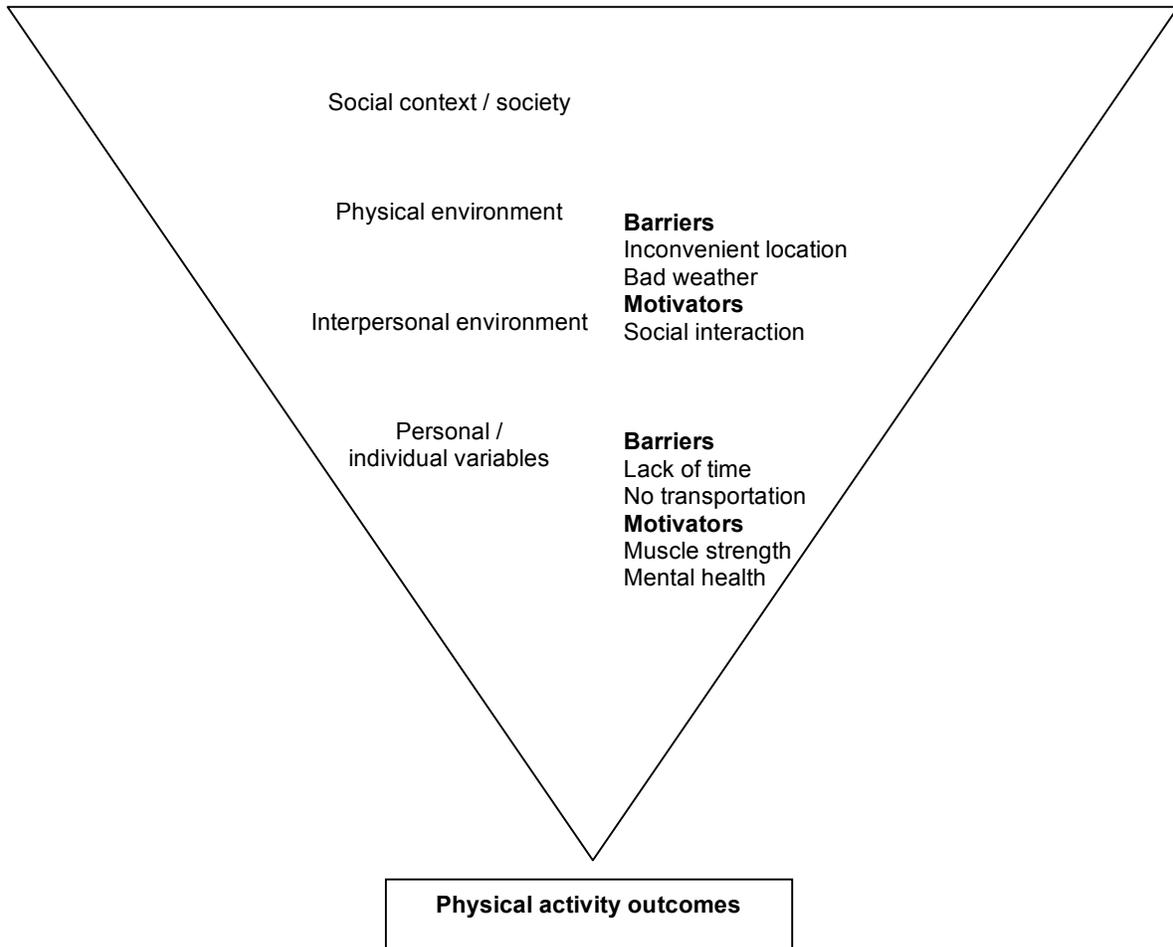
Social interaction as a potential motivator or benefit of taking part in exercise classes represents another variable included in the study that addresses the interpersonal environment. Ethnic minority seniors' centre members were more likely than their Caucasian counterparts to select social interaction as a benefit of exercise classes. This difference could be due to varying cultural emphases on individualism versus collectivism, for instance. Future research should include qualitative measures that address the role of culture in influencing preferences for different types of social situations related to exercise.

The interdisciplinary model of culture and physical activity presents a holistic overview of cultural factors that could influence physical activity-related behaviours. Personal/individual factors at the micro level included demographic, health, and activity level variables; barriers such as lack of time, no

transportation, health issues, get enough exercise elsewhere, no motivation, don't like gyms, and laziness; and motivator variables including physical fitness, managing chronic illnesses, stress reduction, weight loss, muscle strength, and mental health. At the meso level that focuses on the interpersonal and physical environments, variables in the study consisted of the family responsibilities, bad weather, nobody to go with, and inconvenient location barriers; and the social interaction benefit.

Although the current study focussed on personal/individual, interpersonal, and physical environmental factors (i.e., micro- and meso-level variables), future research could employ a model such as this to gain further insight into the role of culture in influencing older adults' perceived barriers and motivators to physical activity, particularly attending exercise classes. This research could focus especially on the macro-level factors of social context and society, perhaps best addressed through qualitative work. **Figure 3** presents a visual organization within the interdisciplinary model of culture and physical activity of perceived barriers and motivators to exercise class attendance that showed statistically significant associations with ethnicity.

Figure 3: Barrier and motivator survey variables and the interdisciplinary model of culture and physical activity



In order to aid the improvement and development of exercise programs for older adults, future research should further investigate perceived motivators and barriers to exercise and how they vary across cultures, focusing on barriers that could be feasibly addressed. Qualitative studies could utilize focus groups or individual interviews to examine participants' perceptions of how particular barriers could be diminished. Asking participants directly for ideas about what seniors' centres could do to lessen barriers to class attendance (e.g.,

inconvenient class scheduling, no transportation, cost of classes) would provide a wealth of potential solutions for facilities to implement.

Recommendations for Physical Activity Programs

Although the current study provides only preliminary insight into how motivators and barriers to exercise class attendance vary by ethnic group, results can be applied to improving existing exercise programs and creating new programs for older adults at seniors' and cultural centres.

Ethnic minority (mostly East Asian in this study) older adults may face more barriers to attending exercise classes than do their Caucasian counterparts. Compared to Caucasians, ethnic minority participants were less likely to choose the "no barriers" option on the survey, and they were more likely than Caucasians to choose all other barriers that showed statistically significant associations with ethnicity except for lack of time: No transportation, bad weather, and inconvenient location. In addition, ethnic minority participants were less certain than Caucasians that they would remain active during the next six months. Of course not much can be done on the part of seniors' centres to address weather and location issues, however, facilities could attend to members' transportation difficulties as resources allow. Volunteer drivers or a carpooling system are no-cost options that could translate into increased exercise class attendance. Lack of transportation may be particularly applicable to older female ethnic minority participants, who may be more likely than Caucasian older adults to not drive.

Promoting both benefits ethnic minority seniors already list and benefits that might not be as salient may make exercise classes more appealing to these groups. Ethnic minority seniors' centre members were more likely than Caucasians to choose social interaction and mental health, and less likely to choose muscle strength as benefits of exercise classes. A preference for social interaction could stem from the collectivistic nature of East Asian cultures. Although exercise classes are inherently more social than exercising on one's own, perhaps adding additional social elements such as brief socials with class instructors after classes, or scheduled gatherings of class attendees before sessions, would increase attendance by East Asian seniors' centre members. Employing multilingual fitness instructors would not only benefit attendees who may experience language barriers, but may also foster a greater connection between exercise class members and instructors (thus also addressing the issue of social interaction). East Asian older adults commonly engage in practices such as Tai Chi and yoga, which encourage mind-body connection and meditation. This is a possible explanation for greater emphasis placed on mental health as a benefit of exercise classes by East Asians compared to Caucasians. Offering additional Tai Chi and yoga classes, and perhaps more clearly incorporating meditation, may better meet the physical activity needs of East Asian older adults. Greater program diversity would benefit seniors' centre members regardless of ethnic background. Offering different types of classes (e.g. classes aimed at male participants, fitness classes for beginners, etc.) may

appeal to individuals who otherwise would not engage in structured exercise programs.

Cultural homogeneity is a construct difficult to address in multicultural seniors' centres. Consistent with previous research, ethnic minority participants placed more importance on cultural homogeneity (i.e., exercising with others of the same cultural background) than did Caucasians. However, the survey item investigated whether exercising with *more* members of the same culture, rather than *only* members of the same culture, would increase participants' attendance. Thus, recruiting more East Asian older adults to take part in exercise classes (e.g., via methods suggested above) at seniors' centres would address ethnic minority members' preference for increased East Asian representation, which in turn would address the concept of cultural homogeneity. Also, expanding programs such as the SUCCESS acculturation program offered for older Chinese immigrants, and developing such programs for individuals of other ethnic backgrounds, would facilitate social interaction among participants of the same ethnic background.

Logistic Challenges

The principal investigator encountered numerous and ongoing challenges during the ten month data collection period. Recruiting ethnic minority participants proved to be extremely difficult, which delayed analysis and completion of thesis requirements. As a Caucasian female visiting seniors' centres alone, virtually no East Asian members participated in the study. The two versions of the survey were professionally translated into Chinese. These

translations were preferred by some participants when used at a Richmond seniors' centre. With the help of a Chinese volunteer research assistant who accompanied the principal investigator, East Asian participation rose significantly but was still not nearly sufficient. The research assistant was available for only two seniors' centre visits.

Having exhausted resources in Richmond by visiting all community and seniors' centres in the city but still having collected not nearly enough responses, a Chinese seniors' immigrant services program (S.U.C.C.E.S.S.) was contacted and agreed to support data collection visits. Four new volunteer research assistants were recruited from the Psychology undergraduate department. However, only one spoke Cantonese (the only language spoken at S.U.C.C.E.S.S.) and all had limited availability. A Cantonese speaking volunteer from the Gerontology undergraduate department then agreed to assist with the project. Only the Chinese translations of the survey were used at this facility, and the research assistant introduced the project and answered questions in Cantonese.

Two visits were made to the S.U.C.C.E.S.S. program, with assistance from a staff member and two research assistants (one speaking Cantonese, the other Mandarin). The first visit resulted in extremely low participation rates. A few older adults did not read or write and thus could not fill out surveys. It is not uncommon for this cohort of Chinese older adults to have very low levels of education. Most members who did read and write were not accustomed to completing surveys and did not understand items such as rating scales. For

example, out of more than 20 E.S.L. class participants we visited, only three agreed to take part in the study. With a Cantonese-speaking research assistant explaining each item, it took more than 40 minutes for these older adults to complete the survey. Another group from a different E.S.L. class required less help from the research assistant, but nevertheless took 30 minutes to complete the survey. Surveys were distributed to a large number of centre members to complete at home, but only one completed survey was returned.

The second visit proved to be more successful. With three research assistants (one speaking Cantonese) as well as S.U.C.C.E.S.S. staff assistance, centre members completed surveys during class time. Although it took approximately 30 minutes for all interested participants to complete the surveys, the response rate was much higher than the first visit (about 80% of class members compared to about 15%).

Limitations

The study sample was a very active subgroup of older adults that may not represent older Canadians at large. Seniors' centre members are not necessarily representative of the general population of older adults; individuals with mobility or physical health limitations and those who are socially isolated, for instance, may be less likely to visit seniors' centres. Only those individuals interested in completing a 5- to 10-minute survey regarding physical activity and exercise classes were included in the study. The general topic of the survey may have deterred individuals who do not exercise, have never attended an exercise class and thus may believe they have minimal input, or have no interest in the

subject. It would be valuable to investigate these individuals' potential reasons for not exercising or attending classes, but recruitment of participants would be extremely challenging.

Most study participants were female, which also limits generalizability to the full population of Canadian seniors. Experiences relating to exercise, seniors' centre participation, as well as motivators and barriers to exercise class participation may vary by gender. Thus, the perspectives of male older adults are underrepresented by the current study.

Because a correlational rather than experimental design was used, we cannot be sufficiently certain that differences in participants' responses stem from their ethnic backgrounds. It is possible that extraneous variables not controlled for in the study could affect outcomes. In future experimental research, cultural icons or symbols could be used as primes in bicultural individuals, randomly "assigning" participants to one or the other culture.

In any study, the lack of random assignment minimizes its potential generalizability to the total population of older adults. Participants were included in the study based on seniors' centre attendance and willingness to participate. Ethnic background is clearly not a variable feasibly assigned during this study, and study groups (i.e., class versus non-class) were self-selected based on older adults' existing behaviour patterns. More refined future research may use the "priming" technique to activate certain culturally-based constructs in randomly-selected participants, and could randomly assign participants to either an

exercise class or a non-exercise class condition to minimize the potential influence of extraneous variables.

Several limitations in the structure of the surveys were observed. The 12-point font size was difficult to read for some older adults, especially given that many didn't have their reading glasses on hand. The principal investigator read aloud the questions for some participants, but this meant spending at least 15-20 minutes per respondent.

The survey could have been more accurate if it had included "not applicable" options for questions concerning chronic disease management. With the current survey, we are unsure of whether participants who chose "not important" or "not likely" to the importance or likeliness of managing chronic disease symptoms with exercise classes had no chronic conditions, or had conditions but did not find those points relevant.

Although the majority of ethnic minority participants were East Asian, classifying ethnic minority participants from diverse backgrounds into one general category glazes over potential nuances between groups and thus does not lead to accurate research practices. With limited numbers of participants, however, ethnic minority participants were grouped into one general category for statistical power purposes. Also, given that the study was exploratory in nature, results can serve as a catalyst for future, more in-depth, cultural research.

Future Research

The dataset obtained for the study could be used for further inquiry, and study results can guide future research. Although beyond the purpose and

research questions of the current study, its dataset could be examined to test for quantitative differences between exercise class and non-class survey groups. For instance, do motivators and barriers of exercise class attendance differ for those currently enrolled in structured exercise classes versus those who are not? Are older adults who participate in exercise classes more active than those who do not take classes or exercise on their own? Another research point that can be preliminarily addressed by the current dataset is whether particular barriers or motivators are more strongly associated with physical activity levels than others. For instance, does reporting not having time to attend exercise classes lead to less frequent exercise class attendance than reporting the cost of classes as a barrier?

Participants in one study included in the literature review raised a point that warrants further inquiry. African American women in Richter et al.'s (2002) study noted that perhaps culture plays a greater role in influencing the *types* of activities individuals engage in, rather than their frequency of engaging in PA in general. The current study did not investigate differences in activity choices across cultures, but provides a dataset that could be used for such analyses. Future research should focus on this issue in greater detail, perhaps by including qualitative interviews and focus groups regarding participants' preferred types of physical activity (rather than focusing solely on *frequency* of activity).

Future research should also investigate ethnic backgrounds other than East Asian. Given Canada's multicultural population of older adults, a deeper understanding of how physical activity relates to many different ethnic

backgrounds will be useful to health promotion and programming on both community and national levels.

To date, no studies investigating ethnic background and physical activity are longitudinal in nature. Longitudinal work would complement the many existing cross-sectional or cohort studies in this area by taking into account changes over time. Physical health can change drastically over time, which would impact an individual's ability to engage in physical activity. Perceived barriers and motivators to exercise may also change with time, such as when individuals progress through the stages of health behaviour change dictated by the Transtheoretical Model (Prochaska, 2006).

The current study focuses solely on cross-cultural barriers and motivators (as per the analytical typology used to classify these constructs) and does not include culturally specific barriers or motivators such as language barriers, lack of gender segregation, or having available more culturally homogeneous exercise classes. Future research should investigate culturally specific barriers and motivators to attending exercise classes – or engaging in physical activity more broadly. This would likely involve focusing on one ethnic minority group at a time, with preliminary studies identifying potential culturally-specific barriers and motivators that could then be investigated in more detail during in-person interviews or quantitative surveys.

Chapter 6: Conclusion

This study contributes intriguing quantitative data to an area of gerontology dominated by qualitative methods. It also offers insight into the scarcely studied field of ethnic background and older adults' motivators and barriers to attending exercise classes. The majority of previous literature investigated motivators and barriers to engaging in physical activity in general.

Results from the study could be used to facilitate program planning, mass media campaigns, and other health promotion efforts targeted toward ethnic minority older adults, and the Canadian senior population in general. For example, based on study results, ethnic minority older adults are less likely than Caucasians to select physical benefits of exercise classes such as muscle strength, and Caucasians are less likely to select psychological benefits such as an increase in mental health. Using results such as these to tailor health promotion campaigns to certain ethnic groups may prove useful in providing them with information their members may not have previously considered.

Study results will be distributed to all seniors' coordinators and other seniors' centre staff members who assisted the researchers or were contacted during the study. The review of research concerning the influence of culture on perceived motivators and barriers of PA will provide a foundation for creating future materials for fitness practitioners regarding cultural competency as well as culturally tailored exercise intervention programs for older adults. Information obtained from the surveys expands the existing knowledge base, which contains limited research concerning ethnic minority Canadians.

Understanding perceived benefits and barriers of being regularly active is relevant to both increasing and maintaining older adults' physical activity levels. Research in this area could aid health promotion campaigns in an effort to increase seniors' PA levels, which are often especially low in ethnic minority groups. Increasing older individuals' perceived benefits of PA may play a role in increasing their activity levels – a significant public health goal that could lead to decreased risks of falls and disability, as well as greater mobility, management of chronic illnesses, independence, and an improved quality of life. It is also important to consider support in *maintaining* already active older adults' physical activity levels. Current health promotion campaigns focus almost exclusively on motivating the older population to begin to become more active – presumably from being sedentary. Individuals such as the seniors' centre members in the current study are already very active; from a population health standpoint, becoming regularly active as well as maintaining an already active lifestyle are both vital to accomplishing health promotion goals.

By studying physically active participants, this study fills in one of many gaps in the existing literature base, which represents mostly sedentary participants. Instead of examining perceived motivators and barriers to PA in general, this study focuses on a specific type of physical activity – group exercise classes. It is hoped that future research will build upon the results found here, and make additional contributions to theory and empirical work that address the role of ethnic background in physical activity.

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Appendix A:

Cultural Differences in Perceived Motivators and Barriers to Physical Activity

(Literature Review)

Reference	Ethnic Group(s)	Sample Demographics	Methods	Definition of PA/Exercise	Motivators for & Benefits of PA	Barriers to & Risks of PA	Role of Culture
Wilcox et al. (2005)		n=39; age 50+; sedentary/underactive; rural South Carolina; patients at primary health care centre; mean age 67.5	Focus groups (3 with each ethnic group)				
	White	n=23; mean age 63.6		PA as general, including chores. Exercise as structured for particular result(s)	<p><i>Motivators:</i> Enjoyment cited more often</p> <p><i>Benefits:</i> Mental health cited more often (e.g. stress reduction)</p>	<p><i>Motivators:</i> Improve health, lose weight, 'feel better'; social support (friends, family, health care providers); want more info re: benefits and demos); church</p> <p><i>Barriers:</i> More personal barriers</p> <p><i>Benefits:</i> Physical health benefits</p>	<p><i>Barriers:</i> Competing responsibilities e.g. work & family); tired, lack of energy, no time for PA; lack of social support; rural areas (lack of facilities, sidewalks, safety, transportation), cost, lack of age-appropriate classes</p> <p><i>Risks:</i> 'Overdoing' it, especially re: age</p>
	African American	n=16; mean age 70.2		Moderate intensity: don't exert too much effort	<i>Benefits:</i> Weight-related benefits cited more often		Lack of role models growing up; exercise not emphasized; previous generations were active without 'exercising'
Kolt et al. (2006)	Tongans living in New Zealand	24 (12 male, 12 female); Auckland, New Zealand; 60-79 years, mean	Focus groups (separated by gender)		<p><i>Benefits:</i> Social, psychological, cognitive, health benefits</p> <p><i>Suggestions to</i></p>	<p><i>Barriers:</i> Education & motivation: how to carry out activities, and education re: benefits; lack of motivation</p> <p>Physical environment: weather, safety for walking, lack of transport</p> <p>Physical/health limitations: back pain</p>	Traditional activities such as Pule (making Tongan tapa), weaving mats, gardening/harvesting, dancing, fishing, climbing coconut trees

		age 69.1; sedentary			<i>encourage PA</i> : church leaders, health professionals, government; community PA programs aimed at specific ethnic groups	Cultural barriers: embarrassment engaging in PA with others, cultural differences in exercise attire (Tongans more coverage), resistance to exercise with non-Tongan others <i>Risks</i> : Cardiovascular concerns, fear of injury/ill health caused by PA
Walcott-McQuigg & Prohaska (2001)	African Americans	n=103; urban; 55+; 46 males & 57 females	Focus groups	Exercise: Calisthenics, physical exertion, formal programs, walking, home exercises, housework, dancing, general movement	<i>Benefits</i> : Physical & mental health benefits; alertness, energizing, relieving stress, uplifting attitude, weight loss, disease prevention (heart health, brain function, blood circulation)	<i>Barriers</i> : Health problems, lack of motivation, time constraints (family responsibilities) <i>Risks</i> : "Makes you tired"
Kang et al. (2007)	Korean American	n=72; age 60-78, mean age 66.1; women with arthritis; completed 6-week aquatic educational program; urban Korean cities	Surveys & structured interviews		<i>Motivators</i> : Adherence associated with social aspects of group cohesion more than interest in activity itself; higher self-efficacy in regular exercises	<i>Barriers</i> : (in order of frequency encountered) No convenient facility, exercise time not appropriate, no transportation, inclement weather, no time, excessive workload, potential injury, uncomfortable to change into swimsuit, cost, aquatic exercise is difficult
Wilcox et al. (2003)	African American & White	n=102; women age 50+, mean age 70.6; rural South Carolina; 41% African American	Surveys		<i>Motivators</i> : (In order of frequency reported) Health, social support, weight loss/ appearance, physical environment, mental health, better weather, GP recommendation	<i>Barriers</i> : (In order of frequency reported) Health problems, no barrier, self-motivation, lack of time, family/household responsibilities, too tired, work responsibilities, disability, no exercise partner, bad weather, pain, community obligations, physical environment, too old to exercise <i>Risks</i> : (In order of frequency reported) No risks, falls, injuries, heart attack, specific health problems, broken bones, few risks if careful, "overdoing it"
Jones & Nies (1996)	African American	n=30; age 60-90, mean age 72.7; seniors' centre	Surveys		<i>Benefits</i> : (In order of decreasing score/agreement) Decreases stress/tension, enjoy exercise, improves	<i>Barriers</i> : (In order of decreasing score/agreement) Places to exercise are far away, fatigued by exercise, people in exercise clothes look funny, afraid to walk in neighbourhood, exercise is tiring, exercise is hard work.

				mental health, increases muscle strength, good entertainment				
Clark (1999)	Primary care patients; age 55-70	Focus groups separated by gender & ethnic group						
	White	n=11; 8 female 3 male		<i>Motivators:</i> Model leader, group setting, slow progression, supportive (females); less pain, willpower (males)	<i>Barriers:</i> Places for activity, transportation, money, weather, motivation, energy, shortness of breath, fear of chest pain, confidence (females); weather, shortness of breath, back pain (males)			
	African American	n=17; 9 female 8 male		<i>Motivators:</i> Group setting, supportive, model leader (females); willpower, knowing its importance, health value (males)	<i>Barriers:</i> Weather, shortness of breath, knee & back pain, fear of chest pain, leg swelling, tired, fear of falling (females); weather, quality of sidewalks, shortness of breath, back pain (males)			
Gonzalez & Jirovec, (2001)	Mexican	n=50; female; ages 65-88, mean age 74; low-income	Individual in-home interviews		<i>Barriers:</i> 32% no obstacle to participate in exercise program; care of husband, care of grandchildren, job responsibilities, church commitments, child at home. Reasons inactive women did not exercise: Jealousy of husband, dislike of exercise, waste of time, physical infirmities, feeling it was not appropriate			
Belza et al. (2004)	American Indian/Native Alaskan	n=71; age 52-85, mean age 71.6; half reported exercising regularly	Ethnic-specific focus groups	<i>Motivators:</i> Chronic illnesses raising awareness of need to be active	<i>Motivators:</i> Health and social benefits, managing chronic illnesses	<i>Barriers:</i> Low self-esteem, isolated from other AI/NAS	<i>Barriers:</i> Chronic conditions, weather, neighbourhood safety, fear of crime, costs, lack of transportation	Cultural community connection as a key motivator
	African American			<i>Motivators:</i> Encouragement from friends, group activities		<i>Barriers:</i> Damp weather aggravating health conditions		
	Vietnamese			<i>Motivators:</i> Blood circulation, avoiding medication, longevity		<i>Barriers:</i> Lack of motivation, geographic isolation (from friends or parks), cold weather		Consistent routine of daily PA
	Chinese from Vietnam			<i>Motivators:</i> Overall health		<i>Barriers:</i> Snow (falling/injury), social obligations		Importance of a daily activity routine
	Korean			<i>Motivators:</i> Relieving joint pain; digestion, relaxation & happiness		<i>Barriers:</i> Tired, dizzy, isolation from other Koreans		Importance of a daily activity routine
	Filipino			<i>Motivators:</i> Socializing, counteracting US high		<i>Barriers:</i> Family and work obligations, illness, fear of falling;		PA as "part of a bigger social picture"; importance of

	Latino			fat diet, blood circulation & digestion	visual/ hearing impairments	socializing with other Filipinos	
	Latino			<i>Motivators:</i> Music, singing, dance; socializing, avoiding depression, being outdoors	<i>Barriers:</i> Not having a PA friend, dizzy spells, lack of energy; visual/ hearing impairments	Faith an integral part of life & daily activity	
Melillo et al. (2001)	Latino	n=18; age 59-76, mean age 66.3	Focus groups	<i>Physical fitness:</i> being able to do anything, mind and body working together, being healthy, feeling "light"	<i>Motivators:</i> Community resources (transportation, place for Latinos to gather), group support (cultural unity, socializing), health providers (guidance)	<i>Barriers:</i> Fear (health issues), feeling of inappropriateness <i>Risks:</i> Worsening health problems, exercising more than necessary leading to death	PA as inappropriate in older age; shame; not accepting that younger years are over; time to slow down/relax
King et al. (2000)	White	n=2912; women aged 40+ n=769	Surveys		<i>Stat. Sig.:</i> Presence of hills	<i>Stat. Sig.:</i> Lack of energy	
	African American	n=745			<i>Stat. Sig. (correlated with reported PA):</i> Observing others exercising in one's neighbourhood, presence of unattended dogs	<i>Stat. Sig.:</i> Caregiving duties	
	Hispanic	n=660			<i>Stat. Sig.:</i> Discouragement from others about being active, presence of hills in neighbourhood	<i>Stat. Sig.:</i> Too tired to exercise	
	American Indian/Alaskan Native	n=738			<i>Stat. Sig.:</i> Self-consciousness about physical appearance	<i>Stat Sig.:</i> Not being in good health	
Whaley & Ebbeck (1997)	Not reported	n=17 (8 male and 9 female); age 65-85; mean age 76.7; seniors' centre users who do not attend exercise classes	Interviews			<i>Self-identified constraints to attending exercise classes:</i> Get exercise elsewhere, health-related problems, time constraints, inconvenience of classes, types of classes offered, rather organize activity myself, want exercise with a purpose, no transportation, need someone with whom to exercise, don't know what they do in classes, mostly women attend, not strenuous enough, too much commitment, not interested, fear of injury, prefer different location, preference for sedentary activities	

Bird et al. (2009)	Italian	n=20; mean age 69.3; women living in Melbourne, Australia	Survey	Participants living alone were more likely to engage in PA	More likely to report poor health, being too tired, not liking exercise	Choice of the following: Not in good health, don't have the energy to exercise, too tired, bad weather, afraid of injury, no motivation, no exercise partner, no safe place to exercise, self-conscious about looks, no time, no care giving assistance, others discourage
	Vietnamese	n=26			More likely to report being self-conscious; less likely to report lack of time, poor health, being too tired, not having energy, not having an exercise partner, low motivation	
	Anglo-Celtic	n=26				
Mouton et al. (2000)	Mexican Americans	n=98; South Texas	In-home interviews	Greater perceived benefits of PA compared to European Americans	Fewer barriers than European Americans	Participants with 8 or less years of education reported greater benefits and fewer barriers compared to those with more education. Women and those with a greater number of chronic diseases reported more barriers to PA.
	European Americans	n=112				

Appendix B:

Detailed Bivariate Results

Exercise related DV's will be reported first, including perceived barriers and benefits of attending exercise class, outcome expectancy values related to exercise classes, self-efficacy concerning remaining active for the next six months, and activity levels. Preference for cultural homogeneity in exercise class settings will be presented next, followed by physical health and activity limitation variables.

Table 1: "Lack of time" barrier by ethnicity and non-class survey group

Survey group			Ethnic group			
			Caucasian	Ethnic minority	Total	
Non-Class	"Lack of time" barrier	No	Count	32	23	55
			% within Ethnic Group	76.2%	92.0%	82.1%
			% of Total	47.8%	34.3%	82.1%
		Yes	Count	10	2	12
			% within Ethnic Group	23.8%	8.0%	17.9%
			% of Total	14.9%	3.0%	17.9%
		Total	Count	42	25	67
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	62.7%	37.3%	100.0%
Chi Square: 2.94; df = 1; Pearson R: -.20; p < 0.1						

The association between listing the "lack of time" barrier and ethnic background was statistically significant only for the non-class survey group. Caucasian respondents were more likely than those of ethnic minority background to rate "lack of time" as a barrier to exercise class. The association ($r = -.20$) is moderate. 23.8% of Caucasian participants chose "lack of time" from the barriers list, while only 8.0% of ethnic minority participants chose this option.

Table 2: “No barrier” option by ethnicity and non-class survey group

Survey group				Ethnic group		
				Caucasian	Ethnic minority	Total
Non-Class	“No barrier” option	No	Count	32	23	55
			% within Ethnic Group	76.2%	92.0%	82.1%
			% of Total	47.8%	34.3%	82.1%
		Yes	Count	10	2	12
			% within Ethnic Group	23.8%	8.0%	17.9%
			% of Total	14.9%	3.0%	17.9%
		Total	Count	42	25	67
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	62.7%	37.3%	100.0%
Chi Square: 2.94; df = 1; Pearson R: -.20; p < 0.1						

Table 3: “No barrier” option by ethnicity and class survey group

Survey group				Ethnic group		
				Caucasian	Ethnic minority	Total
Class	“No barrier” option	No	Count	27	29	56
			% within Ethnic Group	52.9%	80.6%	64.4%
			% of Total	31.0%	33.3%	64.4%
		Yes	Count	24	7	31
			% within Ethnic Group	47.1%	19.4%	35.6%
			% of Total	27.6%	8.0%	35.6%
		Total	Count	51	36	87
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	58.6%	41.4%	100.0%
Chi Square: 7.33; df = 1; Pearson R: -.28; p < 0.01						

For both non-class and class survey groups, ethnic minority older adults were less likely than Caucasians to choose the “no barrier” option from the available survey items. The association was slightly stronger for class participants versus non-class participants ($r = -.20$ vs. $r = -.28$, respectively). For non-class older adults, 23.8% of Caucasian participants chose the “no barrier” option, while only 8.0% of ethnic minority participants said they encountered no

barriers to exercise class attendance. For the exercise class group, 47.1% of Caucasian and 19.4% of ethnic minority participants reported “no barriers”.

Table 4: “No transportation” barrier by ethnicity and non-class survey group

Survey group				Ethnic group		
				Caucasian	Ethnic minority	Total
Non-Class	“No transportation” barrier	No	Count	41	22	63
			% within Ethnic Group	97.6%	88.0%	94.0%
			% of Total	61.2%	32.8%	94.0%
		Yes	Count	1	3	4
			% within Ethnic Group	2.4%	12.0%	6.0%
			% of Total	1.5%	4.5%	6.0%
		Total	Count	42	25	67
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	62.7%	37.3%	100.0%
		Chi Square: 2.51; df = 1; Pearson R: 0.20; p < 0.1				

Table 5: “No transportation” barrier by ethnicity and class survey group

Survey group				Ethnic group		
				Caucasian	Ethnic minority	Total
Class	“No transportation” barrier	No	Count	49	30	79
			% within Ethnic Group	96.1%	83.3%	90.8%
			% of Total	56.3%	34.5%	90.8%
		Yes	Count	2	6	8
			% within Ethnic Group	3.9%	16.7%	9.2%
			% of Total	2.3%	6.9%	9.2%
		Total	Count	51	36	87
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	58.6%	41.4%	100.0%
		Chi Square: 4.11; df = 1; Pearson R: 0.22; p < 0.05				

Associations between choosing the “No transportation” barrier and ethnic group was statistically significant for both exercise class and non-class survey groups. Ethnic minority participants were more likely to choose this barrier than Caucasian participants. For the participants in the non-class group, 12.0% of

ethnic minority respondents chose “No transportation”, compared to only 2.4% of Caucasians. For the exercise class survey group, 16.7% of participants with ethnic minority background chose this barrier, compared to 3.9% of Caucasians. The association was slightly stronger for the class group versus the non-class group ($r = 0.22$ vs. $r = 0.20$, respectively), but moderate in both instances.

Table 6: “Bad weather” barrier by ethnicity and non-class survey group

Survey group				Ethnic group		
				Caucasian	Ethnic minority	Total
Non-Class	“Bad weather” barrier	No	Count	37	15	52
			% within Ethnic Group	88.1%	60.0%	77.6%
			% of Total	55.2%	22.4%	77.6%
		Yes	Count	5	10	15
			% within Ethnic Group	11.9%	40.0%	22.4%
			% of Total	7.5%	14.9%	22.4%
		Total	Count	42	25	67
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	62.7%	37.3%	100.0%
Chi Square: 6.95; df = 1; Pearson R: 0.33; $p < 0.01$						

Table 7: “Bad weather” barrier by ethnicity and class survey group

Survey group				Ethnic group		
				Caucasian	Ethnic minority	Total
Class	“Bad weather” barrier	No	Count	40	15	55
			% within Ethnic Group	78.4%	41.7%	63.2%
			% of Total	46.0%	17.2%	63.2%
		Yes	Count	11	21	32
			% within Ethnic Group	21.6%	58.3%	36.8%
			% of Total	12.6%	24.1%	36.8%
		Total	Count	51	36	87
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	58.6%	41.4%	100.0%
Chi Square: 12.37; df = 1; Pearson R: 0.38; p < 0.001						

Associations between choosing the “Bad weather” barrier and ethnic background were statistically significant for both non-class and class survey groups. Ethnic minority participants were much more likely to choose this option compared to their Caucasian counterparts. Associations were moderate ($r = 0.33$; $p < 0.01$ for non-class; $r = 0.38$; $p < 0.001$ for non-class). For non-class older adults, 40.0% of ethnic minority participants chose “Bad weather” as a barrier, while only 11.9% of Caucasians chose this from the list. In the class group, 58.3% of ethnic minority older adults and only 21.6% of Caucasians chose “Bad weather”.

Table 8: “Inconvenient location” barrier by ethnicity and non-class survey group

Survey group			Ethnic group			
			Caucasian	Ethnic minority	Total	
Non-Class	“Inconvenient location” barrier	No	Count	40	20	60
			% within Ethnic Group	95.2%	80.0%	89.6%
			% of Total	59.7%	29.9%	89.6%
		Yes	Count	2	5	7
			% within Ethnic Group	4.8%	20.0%	10.4%
			% of Total	3.0%	7.5%	10.4%
		Total	Count	42	25	67
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	62.7%	37.3%	100.0%
Chi Square: 3.76; df = 1; Pearson R: 0.24; p < 0.1						

The “Inconvenient location” barrier was statistically significant only for the non-class survey group, with a moderate association ($r = 0.24$; $p < 0.1$). Ethnic minority participants were more than four times more likely to choose this barrier from the list compared to Caucasian participants: 20.0% of ethnic minority older adults and only 4.8% of Caucasian respondents chose “Inconvenient location” as a barrier to attending exercise classes.

Benefits of attending exercise classes

Similar to the survey items concerning, participants chose from a list up to three benefits to attending exercise classes that they felt applied most to them. Responses were coded as “0” for an un-checked item, and “1” for a checked item, translating into “no” or “doesn’t apply” and “yes” or “applies”, respectively. Most perceived benefits did not show statistically significant relationships with ethnicity and survey group; benefit variables showing statistically significant associations are described below.

Table 9: “Social interaction” benefit by ethnicity and class survey group

Survey group			Ethnic group			
			Caucasian	Ethnic minority	Total	
Class	“Social interaction” benefit	No	Count	34	17	51
			% within Ethnic Group	66.7%	45.9%	58.0%
			% of Total	38.6%	19.3%	58.0%
		Yes	Count	17	20	37
			% within Ethnic Group	33.3%	54.1%	42.0%
			% of Total	19.3%	22.7%	42.0%
		Total	Count	51	37	88
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	58.0%	42.0%	100.0%
Chi Square: 3.78; df = 1; Pearson R: 0.21; p < 0.05						

The “Social interaction” benefit was statistically significant only for the class survey group. Ethnic minority participants were more likely to choose this benefit from the list compared to Caucasian participants. The association is moderate ($r = .21$; $p < 0.05$). 54.1% of ethnic minority participants and 33.3% of Caucasian participants selected “Social interaction” from the list of potential benefits of engaging in exercise classes.

Table 10: “Muscle strength” benefit by ethnicity and non-class survey group

Survey group			Ethnic group			
			Caucasian	Ethnic minority	Total	
Non-Class	“Muscle strength” benefit	No	Count	21	19	40
			% within Ethnic Group	51.2%	79.2%	61.5%
			% of Total	32.3%	29.2%	61.5%
		Yes	Count	20	5	25
			% within Ethnic Group	48.8%	20.8%	38.5%
			% of Total	30.8%	7.7%	38.5%
		Total	Count	41	24	65
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	63.1%	36.9%	100.0%
Chi Square: 5.24; df = 1; Pearson R: -.28; p < 0.05						

Table 11: “Muscle strength” benefit by ethnicity and class survey group

Survey group				Ethnic group		
				Caucasian	Ethnic minority	Total
Class	“Muscle strength” benefit	No	Count	15	18	33
			% within Ethnic Group	29.4%	48.6%	37.5%
			% of Total	17.0%	20.5%	37.5%
		Yes	Count	36	19	55
			% within Ethnic Group	70.6%	51.4%	62.5%
			% of Total	40.9%	21.6%	62.5%
		Total	Count	51	37	88
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	58.0%	42.0%	100.0%
Chi Square: 3.38; df = 1; Pearson R: -.20; p < 0.01						

More Caucasian participants viewed muscle strength as a benefit of exercise classes than did ethnic minority participants, across both class and non-class survey groups. For non-class participants, more than twice as many Caucasians selected “Muscle strength” as a potential benefit of engaging in exercise classes compared to ethnic minority participants (48.8% and 20.8% respectively). Within the exercise class survey group, 70.6% of Caucasians and 51.4% of ethnic minority respondents chose this benefit from the list. The associations for each survey group were moderate ($r = -.28$; $p < 0.05$ for non-class and $r = -.20$; $p < 0.1$ for class).

Table 12: “Mental health” benefit by ethnicity and class survey group

Survey group			Ethnic group			
			Caucasian	Ethnic minority	Total	
Class	“Mental health” benefit	No	Count	40	23	63
			% within Ethnic Group	78.4%	62.2%	71.6%
			% of Total	45.5%	26.1%	71.6%
		Yes	Count	11	14	25
			% within Ethnic Group	21.6%	37.8%	28.4%
			% of Total	12.5%	15.9%	28.4%
		Total	Count	51	37	88
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	58.0%	42.0%	100.0%
Chi Square: 2.77; df = 1; Pearson R: 0.18; p < 0.1						

Mental health was seen as a benefit of exercise class attendance by more ethnic minority participants than by Caucasians, but was statistically significant only for the class survey group. The association was small-to-moderate ($r = .18$; $p < 0.1$). 37.8% of ethnic minority and 21.6% of Caucasian older adults chose “Mental health” from the list of potential benefits.

Outcome-expectancy values

Importance and likelihood of seven potential outcomes of exercise class attendance were measured separately, then combined to create outcome-expectancy values. Bivariate results for importance and likelihood of these factors first will be presented separately, followed by the combined outcome-expectancy value variables.

Table 13: Importance of social interaction by ethnicity and class survey group

Survey group				Ethnic group		
				Caucasian	Ethnic minority	Total
Class	Social interaction	Not important	Count	25	11	36
			% within Ethnic Group	47.2%	30.6%	40.4%
			% of Total	28.1%	12.4%	40.4%
		Important	Count	28	25	53
			% within Ethnic Group	52.8%	69.4%	59.6%
			% of Total	31.5%	28.1%	59.6%
		Total	Count	53	36	89
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	59.6%	40.4%	100.0%
Chi Square: 2.50; df = 1; Pearson R: .17; p < 0.1						

The association between perceived importance of social interaction in exercise classes and ethnicity was statistically significant only for the class survey group. Ethnic minority participants compared to their Caucasian counterparts rated social interaction in exercise classes as more important ($r = .17$; $p < 0.1$). Of the ethnic minority participants, 69.4% rated social interaction as important (and 30.6% as not important), while 52.8% of Caucasians rated social interaction as important (with 47.2% choosing not important).

Table 14: Importance of stress reduction by ethnicity and non-class survey group

Survey group		Ethnic group				
		Caucasian	Ethnic minority	Total		
Non-Class	Stress reduction	Not important	Count	19	7	26
			% within Ethnic Group	44.2%	26.9%	37.7%
			% of Total	27.5%	10.1%	37.7%
		Important	Count	24	19	43
			% within Ethnic Group	55.8%	73.1%	62.3%
			% of Total	34.8%	27.5%	62.3%
		Total	Count	43	26	69
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	62.3%	37.7%	100.0%
Chi Square: 2.11; df = 1; Pearson R: -.09; p < 0.1						

The association between ethnicity and perceived importance of stress reduction as a potential outcome of attending exercise classes was statistically significant only for the non-class survey group. A greater proportion of Caucasians rated stress reduction as not important compared to ethnic minority participants (44.2% and 26.9%, respectively). The association between this variable and ethnicity is very weak ($r = -.09$; $p < 0.1$).

Table 15: Importance of managing chronic illnesses by ethnicity and non-class survey group

Survey group			Ethnic group			
			Caucasian	Ethnic minority	Total	
Non-Class	Managing chronic illnesses	Not important	Count	23	9	32
			% within Ethnic Group	60.5%	37.5%	51.6%
			% of Total	37.1%	14.5%	51.6%
		Important	Count	15	15	30
			% within Ethnic Group	39.5%	62.5%	48.4%
			% of Total	24.2%	24.2%	48.4%
		Total	Count	38	24	62
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	61.3%	38.7%	100.0%

Chi Square: 3.15; df = 1; Pearson R: .22; p < 0.1

Table 16: Importance of managing chronic illnesses by ethnicity and class survey group

Survey group			Ethnic group			
			Caucasian	Ethnic minority	Total	
Class	Managing chronic illnesses	Not important	Count	24	9	33
			% within Ethnic Group	50.0%	25.7%	39.8%
			% of Total	28.9%	10.8%	39.8%
		Important	Count	24	26	50
			% within Ethnic Group	50.0%	74.3%	60.2%
			% of Total	28.9%	31.3%	60.2%
		Total	Count	48	35	83
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	57.8%	42.2%	100.0%

Chi Square: 5.11; df = 1; Pearson R: .25; p < 0.05

The association between perceived importance of managing chronic illnesses by ethnicity was statistically significant for both class and non-class survey groups. For both groups, ethnic minority participants' importance ratings of managing chronic illnesses were higher than those of Caucasian participants. For the non-class survey group, 62.5% of ethnic minority participants rated this potential outcome of exercise classes as important, compared to only 39.5% of Caucasians. For the class survey group, 74.3% of ethnic minority and 50.0% of

Caucasians rated managing chronic illnesses as important (versus not important). Associations were moderate: $r = .22$ for non-class respondents ($p < 0.1$), and $r = .25$ for class respondents ($p < 0.05$).

Table 17: Likelihood of increased physical fitness by ethnicity and non-class survey group

Survey group			Ethnic group			
			Caucasian	Ethnic minority	Total	
Non-Class	Increased physical fitness	Not likely	Count	17	5	22
			% within Ethnic Group	39.5%	18.5%	31.4%
			% of Total	24.3%	7.1%	31.4%
		Likely	Count	26	22	48
			% within Ethnic Group	60.5%	81.5%	68.6%
			% of Total	37.1%	31.4%	68.6%
		Total	Count	43	27	70
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	61.4%	38.6%	100.0%
Chi Square: 3.56; df = 1; Pearson R: .22; $p < 0.1$						

The association between perceived likelihood of increased physical fitness due to exercise attendance and ethnicity was statistically significant only for the non-class survey group. Ethnic minority participants were more likely to rate this item as likely compared to their Caucasian counterparts. 81.5% of ethnic minority and 60.5% of Caucasians rated increased physical fitness as important ($r = .22$; $p < 0.1$).

Table 18: Likelihood of better general health by ethnicity and class survey group

Survey group				Ethnic group		
				Caucasian	Ethnic minority	Total
Class	Better general health	Not likely	Count	2	5	7
			% within Ethnic Group	4.0%	14.3%	8.2%
			% of Total	2.4%	5.9%	8.2%
		Likely	Count	48	30	78
			% within Ethnic Group	96.0%	85.7%	91.8%
			% of Total	56.5%	35.3%	91.8%
		Total	Count	50	35	85
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	58.8%	41.2%	100.0%
Chi Square: 2.86; df = 1; Pearson R: -.18; p < 0.1						

The association between perceived likelihood of achieving better general health and ethnicity was statistically significant only for the class survey group. Caucasian participants' likelihood ratings were higher for this item compared to ethnic minority participants. 96.0% of Caucasians and 85.7% of ethnic minority respondents rated better general health as likely to occur due to engaging in structured exercise classes, compared to unlikely ($r = -.18$; $p < 0.1$).

Table 19: Likelihood of increased mental health by ethnicity and non-class survey group

Survey group				Ethnic group		
				Caucasian	Ethnic minority	Total
Non-Class	Increased mental health	Not likely	Count	20	7	27
			% within Ethnic Group	50.0%	28.0%	41.5%
			% of Total	30.8%	10.8%	41.5%
		Likely	Count	20	18	38
			% within Ethnic Group	50.0%	72.0%	58.5%
			% of Total	30.8%	27.7%	58.5%
		Total	Count	40	25	65
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	61.5%	38.5%	100.0%
Chi Square: 3.14; df = 1; Pearson R: .22; p < 0.1						

The association between perceived likelihood of increased mental health due to exercise class attendance and ethnicity was statistically significant only for the non-class survey group. Ethnic minority participants rated this item as more likely to occur in contrast with Caucasian older adults. 72.0% of ethnic minority and 50.0% of Caucasians rated increased mental health as likely compared to unlikely ($r = .22$; $p < 0.1$).

Table 20: Likelihood of stress reduction by ethnicity and non-class survey group

Survey group		Ethnic group				
		Caucasian	Ethnic minority	Total		
Non-Class	Stress reduction	Not likely	Count	19	6	25
			% within Ethnic Group	45.2%	24.0%	37.3%
			% of Total	28.4%	9.0%	37.3%
	Likely	Count	23	19	42	
		% within Ethnic Group	54.8%	76.0%	62.7%	
		% of Total	34.3%	28.4%	62.7%	
	Total	Count	42	25	67	
		% within Ethnic Group	100.0%	100.0%	100.0%	
		% of Total	62.7%	37.3%	100.0%	
Chi Square: 3.12; df = 1; Pearson R: .21; $p < 0.1$						

The association between ethnicity and perceived likelihood of stress reduction with regular exercise class attendance was statistically significant only for the non-class survey group. In contrast to Caucasians, more ethnic minority seniors' centre members rated this item as likely to occur versus unlikely ($r = .21$; $p < 0.1$).

Table 21: Likelihood of weight loss by ethnicity and class survey group

Survey group				Ethnic group				
				Caucasian	Ethnic minority	Total		
Class	Weight loss	Not likely	Count	35	14	49		
			% within Ethnic Group	64.8%	40.0%	55.1%		
			% of Total	39.3%	15.7%	55.1%		
		Likely	Count	19	21	40		
			% within Ethnic Group	35.2%	60.0%	44.9%		
			% of Total	21.3%	23.6%	44.9%		
		Total	Count	54	35	89		
			% within Ethnic Group	100.0%	100.0%	100.0%		
			% of Total	60.7%	39.3%	100.0%		
		Chi Square: 5.31; df = 1; Pearson R: .24; p < 0.05						

The association between perceived likelihood of weight loss due to exercise class attendance and ethnicity was statistically significant only for class participants. Ethnic minority participants' likelihood ratings were higher than those of Caucasian respondents. 60.0% of ethnic minority and 35.2% of Caucasians rated this item as likely compared to unlikely, which resulted in an association of moderate strength ($r = .24$; $p < 0.05$).

Perceived importance and perceived likelihood scores were combined to create composite outcome-expectancy value scores for each of the seven potential outcomes of exercise classes (managing chronic illnesses, increased physical fitness, better general health, increased mental health, social interaction, stress reduction, and weight loss). Only two of the seven outcome-expectancy values showed statistically significant associations with ethnicity, and both only for the non-class survey group.

Table 22: Outcome-expectancy value for stress reduction by ethnicity and non-class survey group

Survey group				Ethnic group		
				Caucasian	Ethnic minority	Total
Non-Class	Outcome-expectancy for stress reduction	Low	Count	20	5	25
			% within Ethnic Group	50.0%	21.7%	39.7%
			% of Total	31.7%	7.9%	39.7%
		High	Count	20	18	38
			% within Ethnic Group	50.0%	78.3%	60.3%
			% of Total	31.7%	28.6%	60.3%
		Total	Count	40	23	63
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	63.5%	36.5%	100.0%
Chi Square: 5.10; df = 1; Pearson R: .29; p < 0.05						

Ethnic minority participants compared to Caucasians had higher outcome-expectancy value ratings for stress reduction. This association was moderate in strength ($r = .29$; $p < 0.05$). 78.3% of the ethnic minority sample reported a high outcome-expectancy value, while 50.0% of Caucasians chose a high outcome-expectancy value.

Table 23: Outcome-expectancy value for increased mental health by ethnicity and non-class survey group

Survey group				Ethnic group		
				Caucasian	Ethnic minority	Total
Non-Class	Outcome-expectancy for increased mental health	Low	Count	22	5	27
			% within Ethnic Group	55.0%	21.7%	42.9%
			% of Total	34.9%	7.9%	42.9%
		High	Count	18	18	36
			% within Ethnic Group	45.0%	78.3%	57.1%
			% of Total	28.6%	28.6%	57.1%
		Total	Count	40	23	63
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	63.5%	36.5%	100.0%
Chi Square: 6.91; df = 1; Pearson R: .32; p < 0.01						

Ethnic minority older adults compared to Caucasians had higher outcome-expectancy value scores for increased mental health. 78.3% of ethnic minority participants and only 45.0% of Caucasians reported a high outcome-expectancy value ($r = .32$; $p < 0.01$).

Self-efficacy

Self-efficacy showed a statistically significant relationship with ethnic background only for the non-class survey group.

Table 24: Exercise-related self-efficacy by ethnicity and non-class survey group

Survey group				Ethnic group		
				Caucasian	Ethnic minority	Total
Non-Class	Self-efficacy	Not certain	Count	5	11	16
			% within Ethnic Group	10.6%	37.9%	21.1%
			% of Total	6.6%	14.5%	21.1%
		Very certain	Count	42	18	60
			% within Ethnic Group	89.4%	62.1%	78.9%
			% of Total	55.3%	23.7%	78.9%
		Total	Count	47	29	76
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	61.8%	38.2%	100.0%
Chi Square: 7.88; df = 1; Pearson R: -.34; $p < 0.01$						

Caucasian older adults were more certain than their ethnic minority counterparts that they would maintain an active lifestyle for the next six months ($r = -.34$; $p < 0.01$). 89.4% of Caucasian participants felt very certain that they would be active (i.e., at least 30 minutes of moderate physical activity most days of the week) for the next six months, compared to 62.1% of ethnic minority participants. Conversely, 10.6% of Caucasians were not certain about remaining active, while 37.9% of ethnic minority participants were not certain.

Activity levels

Total activity levels for all participants were calculated from two survey items assessing frequency of physical activity (one for how often respondents attended exercise classes, and one for how often they exercised outside of structured class settings).

Table 25: Level of physical activity by ethnicity and non-class survey group

Survey group				Ethnic group		
				Caucasian	Ethnic minority	Total
Non-Class	Level of physical activity	Inactive	Count	12	12	24
			% within Ethnic Group	25.5%	41.4%	31.6%
			% of Total	15.8%	15.8%	31.6%
		Active	Count	35	17	52
			% within Ethnic Group	74.5%	58.6%	68.4%
			% of Total	46.1%	22.4%	68.4%
		Total	Count	47	29	76
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	61.8%	38.2%	100.0%
Chi Square: 2.06; df = 1; Pearson R: -.17; p < 0.1						

The association between ethnicity and physical activity was statistically significant only for the non-class survey group. Caucasian older adults were more likely to report being active (versus inactive) compared to ethnic minority participants ($r = -.17$; $p < 0.1$). 74.5% of Caucasians were classified as being active (i.e. exercising three times per week or more), while only 58.6% of ethnic minority older adults were considered active.

Preference for cultural homogeneity

Participants rated on a scale from one to ten the importance of exercising with others of the same cultural background in structured class settings. The

association between ethnicity and preference for cultural homogeneity was statistically significant for both non-class and class survey groups.

Table 26: Perceived importance of cultural homogeneity in exercise classes by ethnicity and non-class survey group

Survey group			Ethnic group			
			Caucasian	Ethnic minority	Total	
Non-Class	Importance of cultural homogeneity	Not important	Count	23	7	30
			% within Ethnic Group	54.8%	28.0%	44.8%
			% of Total	34.3%	10.4%	44.8%
		Important	Count	19	18	37
			% within Ethnic Group	45.2%	72.0%	55.2%
			% of Total	28.4%	26.9%	55.2%
		Total	Count	42	25	67
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	62.7%	37.3%	100.0%
Chi Square: 4.66; df = 1; Pearson R: .23; p < 0.05						

Table 27: Perceived importance of cultural homogeneity in exercise classes by ethnicity and class survey group

Survey group			Ethnic group			
			Caucasian	Ethnic minority	Total	
Class	Importance of cultural homogeneity	Not important	Count	31	13	44
			% within Ethnic Group	59.6%	36.1%	50.0%
			% of Total	35.2%	14.8%	50.0%
		Important	Count	21	23	44
			% within Ethnic Group	40.4%	63.9%	50.0%
			% of Total	23.9%	26.1%	50.0%
		Total	Count	52	36	88
			% within Ethnic Group	100.0%	100.0%	100.0%
			% of Total	59.1%	40.9%	100.0%
Chi Square: 4.75; df = 1; Pearson R: .23; p < 0.05						

For both class and non-class survey groups, the association between perceived importance of cultural homogeneity in exercise class settings and ethnicity was statistically significant and of moderate strength ($r = .23$; $p < 0.05$)

for both groups). Ethnic minority older adults rated cultural homogeneity in exercise classes as important (versus not important) more often than did Caucasians. 63.9% of ethnic minority participants and only 40.4% of Caucasians rated this item as important.

Physical health

The association between ethnicity and physical health was not statistically significant for either the non-class or class survey groups.

Activity limitation

For both non-class and class survey groups, the association between ethnicity and activity limitation was not statistically significant.

Appendix C:

Survey for Exercise Class Attendees

If you do not take part in exercise classes (e.g., Aquafit, Tai Chi, fitness class) at this seniors' centre or elsewhere, please ask for another version of this survey.

1.	2. Compared to others your age, how do you rate your physical health?	3. Gender	4. Marital status
Age: _____	<input type="checkbox"/> Excellent <input type="checkbox"/> Very good <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor	<input type="checkbox"/> Male <input type="checkbox"/> Female	<input type="checkbox"/> Married <input type="checkbox"/> Divorced <input type="checkbox"/> Separated <input type="checkbox"/> Widowed <input type="checkbox"/> Single <input type="checkbox"/> In a non-marital relationship
5. With which ethnic group to you most identify?	6. Highest level of education	7. Annual income	
<input type="checkbox"/> East Asian (China, Hong Kong, Japan, Korea, Taiwan) <input type="checkbox"/> South Asian (India, Pakistan, Bangladesh) <input type="checkbox"/> Black <input type="checkbox"/> Hispanic <input type="checkbox"/> Caucasian <input type="checkbox"/> First Nations <input type="checkbox"/> Other: _____	<input type="checkbox"/> Less than high school <input type="checkbox"/> Graduated high school <input type="checkbox"/> Non-university post-secondary certificate <input type="checkbox"/> University degree or certificate	<input type="checkbox"/> under \$10,000 <input type="checkbox"/> \$10,000 - \$24,999 <input type="checkbox"/> \$25,000 - \$39,999 <input type="checkbox"/> \$40,000 - \$54,999 <input type="checkbox"/> \$55,000 - \$69,999 <input type="checkbox"/> \$70,000 - \$84,999 <input type="checkbox"/> \$85,000 and up	
8. Is English your first language?	9. How long have you lived in Canada?	10. How long have you been a member of a seniors' centre?	
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Less than 1 year <input type="checkbox"/> 1 – 5 years <input type="checkbox"/> 6 – 10 years <input type="checkbox"/> 11 – 15 years <input type="checkbox"/> 16 – 20 years <input type="checkbox"/> More than 20 years <input type="checkbox"/> Born in Canada	<input type="checkbox"/> Not a member <input type="checkbox"/> 6 months or less <input type="checkbox"/> 6 – 12 months <input type="checkbox"/> 1 – 3 years <input type="checkbox"/> 3 – 5 years <input type="checkbox"/> More than 5 years	
11. Does a long-term physical condition, mental condition, or health problem reduce the amount or type of activity you can do at home?		12. Does a long-term physical condition, mental condition, or health problem reduce the amount or type of activity you can do outside your home, such as leisure or transportation?	
<input type="checkbox"/> Never <input type="checkbox"/> Sometimes <input type="checkbox"/> Often		<input type="checkbox"/> Never <input type="checkbox"/> Sometimes <input type="checkbox"/> Often	

13. How often do you usually attend exercise classes?

- Never
- Once a month or less
- Twice a month
- Once a week
- Twice a week
- Three times a week
- Four times a week or more

14. What types of exercise classes do you attend? Check all that apply.

- Aerobic fitness
- Aquafit
- Dance
- Strength/weight training
- Tai Chi or yoga
- Other: _____

15. How long have you been attending exercise classes?

- Less than 6 months
- 7 – 11 months
- 1 – 2 years
- 3 – 5 years
- More than 5 years

16. Please think about your reasons for participating in exercise classes. How important to you are the following possible outcomes of exercise classes? Please circle a number from 1 (not important) to 5 (very important).

Increased physical fitness:	Not Important				Very Important
	1	2	3	4	5
Social interaction:	Not Important				Very Important
	1	2	3	4	5
Increased mental health:	Not Important				Very Important
	1	2	3	4	5
Better general health:	Not Important				Very Important
	1	2	3	4	5
Weight loss:	Not Important				Very Important
	1	2	3	4	5
Managing chronic illnesses:	Not Important				Very Important
	1	2	3	4	5
Stress reduction:	Not Important				Very Important
	1	2	3	4	5

17. How likely is it that you will attain each of the following outcomes from the exercise class(es) you are currently attending? Please rate from 1 (unlikely) to 5 (likely).

Social interaction:	Unlikely				Likely
	1	2	3	4	5
Increased physical fitness:	Unlikely				Likely
	1	2	3	4	5
Weight loss:	Unlikely				Likely
	1	2	3	4	5
Managing chronic illnesses:	Unlikely				Likely
	1	2	3	4	5
Increased mental health:	Unlikely				Likely
	1	2	3	4	5
Better general health:	Unlikely				Likely
	1	2	3	4	5
Stress reduction:	Unlikely				Likely
	1	2	3	4	5

18. How important is it to you to attend exercise classes with others of your cultural background?

Not Important

Very Important

1 2 3 4 5 6 7 8 9 10

19. Would you attend exercise classes more regularly if more members of your cultural group were present?

Not Likely

Very Likely

1 2 3 4 5 6 7 8 9 10

20. How often should older adults engage in physical activity to maintain optimal health, in your opinion? Please fill in the blanks.

Older adults should engage in physical activity _____ minutes per day on _____ days per week.

21. Please select from the list up to **3** barriers to coming to exercise classes that you face most often:

- | | |
|--|--|
| <input type="checkbox"/> Lack of time | <input type="checkbox"/> Cost of classes |
| <input type="checkbox"/> No transportation | <input type="checkbox"/> Nobody to go with |
| <input type="checkbox"/> Family responsibilities | <input type="checkbox"/> Inconvenient location |
| <input type="checkbox"/> Bad weather | <input type="checkbox"/> Get enough exercise elsewhere |
| <input type="checkbox"/> Health issues | <input type="checkbox"/> No barriers |
| <input type="checkbox"/> Classes are scheduled at inconvenient times | <input type="checkbox"/> Other: _____ |
| | _____ |

22. Please select up to **3** benefits of exercise classes that apply most to you:

- | | |
|---|--|
| <input type="checkbox"/> Physical fitness | <input type="checkbox"/> Muscle strength |
| <input type="checkbox"/> Social interaction | <input type="checkbox"/> Mental health |
| <input type="checkbox"/> Managing chronic illnesses | <input type="checkbox"/> No benefits |
| <input type="checkbox"/> Stress reduction | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Weight loss | _____ |

23. How often do you usually exercise outside of exercise classes?

- Never
- Once a month or less
- Twice a month
- Once a week
- Twice a week
- Three times a week
- Four times a week or more

24. About how much time do you spend on each occasion?

- 1 to 15 minutes
- 16 to 30 minutes
- 31 to 60 minutes
- More than one hour

25. What types of exercise do you engage in? Check all that apply.

- | | |
|--|---|
| <input type="checkbox"/> Walking | <input type="checkbox"/> Weight training |
| <input type="checkbox"/> Jogging/running | <input type="checkbox"/> Tai Chi or yoga |
| <input type="checkbox"/> Bicycling | <input type="checkbox"/> Organized sports |
| <input type="checkbox"/> Swimming | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Dance | _____ |
| <input type="checkbox"/> Home exercises | _____ |

26. How certain are you that you will maintain an active lifestyle (i.e., exercise for at least 30 minutes on most days of the week) in the next 6 months?

Not Certain

Very Certain

1 2 3 4 5 6 7 8 9 10

Please rate the following statements from 1 (strongly disagree) to 10 (strongly agree).

27. Being able to speak English is important to me.

Strongly disagree

Strongly agree

1 2 3 4 5 6 7 8 9 10

28. I like to celebrate Canadian holidays.

Strongly disagree

Strongly agree

1 2 3 4 5 6 7 8 9 10

29. I identify myself as a Canadian.

Strongly disagree

Strongly agree

1 2 3 4 5 6 7 8 9 10

30. It is important to me to have Canadian friends.

Strongly disagree

Strongly agree

1 2 3 4 5 6 7 8 9 10

31. Many Canadian values are important to me.

Strongly disagree

Strongly agree

1 2 3 4 5 6 7 8 9 10

Thank you for your participation! Your time is greatly appreciated.

Appendix D:

Survey for Non-Exercise Class Participants

If you take part in exercise classes (e.g., Aquafit, Tai Chi, fitness class) at this seniors' centre or elsewhere, please ask for another version of this survey.

1.	2. Compared to others your age, how do you rate your physical health?	3. Gender	4. Marital status
Age: _____	<input type="checkbox"/> Excellent <input type="checkbox"/> Very good <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor	<input type="checkbox"/> Male <input type="checkbox"/> Female	<input type="checkbox"/> Married <input type="checkbox"/> Divorced <input type="checkbox"/> Separated <input type="checkbox"/> Widowed <input type="checkbox"/> Single <input type="checkbox"/> In a non-marital relationship
5. With which ethnic group do you most identify?	6. Highest level of education	7. Annual income	
<input type="checkbox"/> East Asian (<i>China, Hong Kong, Japan, Korea, Taiwan</i>) <input type="checkbox"/> South Asian (<i>India, Pakistan, Bangladesh</i>) <input type="checkbox"/> Black <input type="checkbox"/> Hispanic <input type="checkbox"/> First Nations <input type="checkbox"/> Caucasian <input type="checkbox"/> Other: _____	<input type="checkbox"/> Less than high school <input type="checkbox"/> Graduated high school <input type="checkbox"/> Non-university post-secondary certificate <input type="checkbox"/> University degree or certificate	<input type="checkbox"/> under \$10,000 <input type="checkbox"/> \$10,000 - \$24,999 <input type="checkbox"/> \$25,000 - \$39,999 <input type="checkbox"/> \$40,000 - \$54,999 <input type="checkbox"/> \$55,000 - \$69,999 <input type="checkbox"/> \$70,000 - \$84,999 <input type="checkbox"/> \$85,000 and up	
8. Is English your first language?	9. How long have you lived in Canada?	10. How long have you been a member of a seniors' centre?	
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Less than 1 year <input type="checkbox"/> 1 – 5 years <input type="checkbox"/> 6 – 10 years <input type="checkbox"/> 11 – 15 years <input type="checkbox"/> 16 – 20 years <input type="checkbox"/> More than 20 years <input type="checkbox"/> Born in Canada	<input type="checkbox"/> Not a member <input type="checkbox"/> 6 months or less <input type="checkbox"/> 6 – 12 months <input type="checkbox"/> 1 – 3 years <input type="checkbox"/> 3 – 5 years <input type="checkbox"/> More than 5 years	
11. Does a long-term physical condition, mental condition, or health problem reduce the amount or type of activity you can do at home?		12. Does a long-term physical condition, mental condition, or health problem reduce the amount or type of activity you can do outside your home, such as leisure or transportation?	
<input type="checkbox"/> Never <input type="checkbox"/> Sometimes <input type="checkbox"/> Often		<input type="checkbox"/> Never <input type="checkbox"/> Sometimes <input type="checkbox"/> Often	

13. How often do you usually attend exercise classes?

- Never
- Once a month or less
- Twice a month
- Once a week
- Twice a week
- Three times a week
- Four times a week or more

14. Are you interested in or have you considered joining an exercise class?

- Yes
- No
- Not sure

15. What types of exercise classes would you be interested in, if any?

- Aerobic fitness
 - Aquafit
 - Dance
 - Strength/weight training
 - Tai Chi or yoga
 - Other:
-
- Not interested in any

16. If you were to attend exercise classes, how important to you would be the following possible outcomes of exercise classes? Please circle a number from 1 (not important) to 5 (very important).

Increased physical fitness:	Not Important				Very Important
	1	2	3	4	5
Social interaction:	Not Important				Very Important
	1	2	3	4	5
Increased mental health:	Not Important				Very Important
	1	2	3	4	5
Better general health:	Not Important				Very Important
	1	2	3	4	5
Weight loss:	Not Important				Very Important
	1	2	3	4	5
Managing chronic illnesses:	Not Important				Very Important
	1	2	3	4	5
Stress reduction:	Not Important				Very Important
	1	2	3	4	5

17. If you were to attend exercise classes, how likely is it that you would attain each of the following outcomes? Please rate from 1 (unlikely) to 5 (likely).

Social interaction:	Unlikely				Likely
	1	2	3	4	5
Increased physical fitness:	Unlikely				Likely
	1	2	3	4	5
Weight loss:	Unlikely				Likely
	1	2	3	4	5
Managing chronic illnesses:	Unlikely				Likely
	1	2	3	4	5
Increased mental health:	Unlikely				Likely
	1	2	3	4	5
Better general health:	Unlikely				Likely
	1	2	3	4	5
Stress reduction:	Unlikely				Likely
	1	2	3	4	5

18. If you were to attend exercise classes, how important would it be to you to attend exercise classes with others of your cultural background?

Not Important

Very Important

1 2 3 4 5 6 7 8 9 10

19. How often should older adults engage in physical activity to maintain optimal health, in your opinion? Please fill in the blanks.

Older adults should engage in physical activity _____ minutes per day on _____ days per week.

21. Please select from the list up to 3 barriers to coming to exercise classes that you face most often:

- | | |
|--|--|
| <input type="checkbox"/> Lack of time | <input type="checkbox"/> Cost of classes |
| <input type="checkbox"/> No transportation | <input type="checkbox"/> Nobody to go with |
| <input type="checkbox"/> Family responsibilities | <input type="checkbox"/> Inconvenient location |
| <input type="checkbox"/> Bad weather | <input type="checkbox"/> Get enough exercise elsewhere |
| <input type="checkbox"/> Health issues | <input type="checkbox"/> No barriers |
| <input type="checkbox"/> Classes are scheduled at inconvenient times | <input type="checkbox"/> Other: _____ |

22. Please select up to 3 benefits of exercise classes that apply most to you:

- | | |
|---|--|
| <input type="checkbox"/> Physical fitness | <input type="checkbox"/> Muscle strength |
| <input type="checkbox"/> Social interaction | <input type="checkbox"/> Mental health |
| <input type="checkbox"/> Managing chronic illnesses | <input type="checkbox"/> No benefits |
| <input type="checkbox"/> Stress reduction | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Weight loss | _____ |

22. How often do you usually exercise outside of exercise classes?

- Never
If 'never', please skip to question #25
- Once a month or less
- Twice a month
- Once a week
- Twice a week
- Three times a week
- Four times a week or more

23. About how much time do you spend on each occasion?

- 1 to 15 minutes
- 16 to 30 minutes
- 31 to 60 minutes
- More than one hour

24. What types of exercise do you engage in? Check all that apply.

- | | |
|--|---|
| <input type="checkbox"/> Walking | <input type="checkbox"/> Weight training |
| <input type="checkbox"/> Jogging/running | <input type="checkbox"/> Tai Chi or yoga |
| <input type="checkbox"/> Bicycling | <input type="checkbox"/> Organized sports |
| <input type="checkbox"/> Swimming | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Dance | _____ |
| <input type="checkbox"/> Home exercises | _____ |

25. How certain are you that you will maintain an active lifestyle (i.e., exercise for at least 30 minutes on most days of the week) in the next 6 months?

Not Certain

Very Certain

1 2 3 4 5 6 7 8 9 10

Please rate the following statements from 1 (strongly disagree) to 10 (strongly agree).

26. Being able to speak English is important to me.

Strongly disagree

Strongly agree

1 2 3 4 5 6 7 8 9 10

27. I like to celebrate Canadian holidays.

Strongly disagree

Strongly agree

1 2 3 4 5 6 7 8 9 10

28. I identify myself as a Canadian.

Strongly disagree

Strongly agree

1 2 3 4 5 6 7 8 9 10

29. It is important to me to have Canadian friends.

Strongly disagree

Strongly agree

1 2 3 4 5 6 7 8 9 10

30. Many Canadian values are important to me.

Strongly disagree

Strongly agree

1 2 3 4 5 6 7 8 9 10

Thank you for your participation! Your time is greatly appreciated.

Appendix E:

Informed Consent Form

Informed Consent Form

This study is being conducted as part of a Master's degree requirement for Simon Fraser University. The seniors' centre you attend has given permission for this research to be carried out.

Principal Investigator: Karina Hackett, MA Candidate, Department of Gerontology

Title of the Study: Exploring Culture and Older Adults' Perceived Motivators and Barriers of Group Exercise

Goals of the Study: The purpose of this study is to gain insight into older adults' motivators and barriers for physical activity, including exercise classes, and how culture may influence these factors.

What You Will Be Asked to Do: The study involves a 5-minute survey concerning basic demographic information and your physical activity patterns. Participation is voluntary, and you can refuse to answer any question.

Risks and Discomforts: We do not foresee any risks or discomfort from your participation in the study.

Benefits of the Research: This research will provide valuable information to the academic literature as well as to health and fitness professionals about older adults' exercise patterns and programs available in the community.

Withdrawal from the Study: You can stop participating in this study at any time, for any reason. Withdrawing from the project will not result in any negative consequences for you.

Confidentiality: Your responses will be kept confidential and will not be linked to you personally (consent forms and surveys will be stored separately); your name will not be used in any report or publication of the research.

Questions about the Research? If you have questions about the research in general or about your role in the study, or to obtain research results upon completion of the study, please feel free to contact Karina Hackett by telephone at 778-230-6849 or by e-mail at KarinaH@sfu.ca. Unless specified by you, we will not be contacting you after your participation in the study.

For concerns regarding your rights as a participant, please contact:

Hal Weinberg, Director
Office of Research Ethics
Simon Fraser University
Burnaby, BC V5A 1S6
778-782-6593 / Hal_Weinberg@sfu.ca

By your signature below, you agree to participate in this study.

Signature

Participant

Date

Signature

Principal Investigator

Date

Appendix F:
Study Information Letter

#207 5955 Yew St.
Vancouver BC V6M 3Y7
KarinaH@sfu.ca
778-230-6849

Date

Name
Address
E-mail

Dear _____,

I am conducting research as part of a Master's degree requirement for Simon Fraser University's Gerontology department. My study is titled *Ethnic Background and Older Adults' Perceived Barriers and Motivators of Group Exercise*, using seniors' centre members as participants. Participants will complete a 5- to 10-minute survey. I would very much appreciate your permission for this research to be conducted at your organization.

The purpose of this study is to gain insight into older adults' motivators and barriers for physical activity, including exercise classes, and how culture might influence these factors. This research will provide valuable information to the academic literature as well as to health and fitness professionals about older adults' exercise patterns and programs available in the community.

The surveys contain questions concerning basic demographic information as well as physical activity patterns. Participation is voluntary, and each participant will sign an informed consent form before taking part in the study. We do not foresee any risks or discomfort from participating in the study, and individuals can stop participating at any time, for any reason. Responses will be kept confidential and will not be linked to individual participants; names will not be used in any report or publication of the research.

After obtaining permission from class instructors, I would appreciate being able to visit classes offered at your centre to briefly introduce the project. Surveys will be available for completion after classes.

Should you have any questions about the project please feel free to contact me at 778-230-6849 or by e-mail at KarinaH@sfu.ca.

Thank you – your time is greatly appreciated!

Sincerely,

Karina Hackett

Master of Arts Candidate
Department of Gerontology, Simon Fraser
University
2800 515 W Hastings St., Vancouver BC

Appendix G:

Chinese Translation of Survey for Exercise Class

Attendees

如果您沒有在此耆英中心或其他地方參加運動班（例如水中健身、太極、健身班），請索取另一個版本的調查表。

1.	2. 與您的同齡人相比，您如何評價您的身體狀況？	3. 性別	4. 婚姻狀況
年齡： _____	<input type="checkbox"/> 極好 <input type="checkbox"/> 很好 <input type="checkbox"/> 良好 <input type="checkbox"/> 一般 <input type="checkbox"/> 差勁	<input type="checkbox"/> 男性 <input type="checkbox"/> 女性	<input type="checkbox"/> 已婚 <input type="checkbox"/> 離異 <input type="checkbox"/> 分居 <input type="checkbox"/> 喪偶 <input type="checkbox"/> 單身 <input type="checkbox"/> 在非婚姻關係中
5. 您認為自己屬於哪個族裔？	6. 最高學歷	7. 年收入	
<input type="checkbox"/> 東亞人（中國、香港、日本、韓國、臺灣） <input type="checkbox"/> 南亞人（印度、巴基斯坦、孟加拉國） <input type="checkbox"/> 黑人 <input type="checkbox"/> 西班牙裔 <input type="checkbox"/> 白人 <input type="checkbox"/> 原住民 <input type="checkbox"/> 其他： _____	<input type="checkbox"/> 中學以下 <input type="checkbox"/> 中學畢業 <input type="checkbox"/> 大專證書 <input type="checkbox"/> 大學學位或證書	<input type="checkbox"/> 10,000加元以下 <input type="checkbox"/> 10,000 - 24,999加元 <input type="checkbox"/> 25,000 - 39,999加元 <input type="checkbox"/> 40,000 - 54,999加元 <input type="checkbox"/> 55,000 - 69,999加元 <input type="checkbox"/> 70,000 - 84,999加元 <input type="checkbox"/> 85,000加元及以上	
8. 英語是您的第一語言嗎？	9. 您在加拿大生活多長時間了？	10. 您成為耆英中心的會員已有多長時間了？	
<input type="checkbox"/> 是 <input type="checkbox"/> 否	<input type="checkbox"/> 不到一年 <input type="checkbox"/> 1 - 5年 <input type="checkbox"/> 6 - 10年 <input type="checkbox"/> 11 - 15年 <input type="checkbox"/> 16 - 20年 <input type="checkbox"/> 20年以上 <input type="checkbox"/> 出生在加拿大	<input type="checkbox"/> 不是會員 <input type="checkbox"/> 6個月或以下 <input type="checkbox"/> 6 - 12個月 <input type="checkbox"/> 1 - 3年 <input type="checkbox"/> 3 - 5年 <input type="checkbox"/> 5年以上	
11. 您在家裡的活動量或活動種類有沒有因為長期的身體狀況、心理狀況或健康問題而減少？	12. 您在外面的活動量或活動種類，例如休閒活動或交通，有沒有因為長期的身體狀況、心理狀況或健康問題而減少？		
<input type="checkbox"/> 從未 <input type="checkbox"/> 有時 <input type="checkbox"/> 經常	<input type="checkbox"/> 從未 <input type="checkbox"/> 有時 <input type="checkbox"/> 經常		

13. 您通常多久參加一次運動班？

- 從未
- 每月一次或更少
- 一個月兩次
- 一星期一次
- 一星期兩次
- 一星期三次
- 一星期四次

14. 您參加哪類運動班？勾選所有適用項目。

- 有氧健身
- 水中健身
- 跳舞
- 力量/舉重訓練
- 太極或瑜珈
- 其他：

15. 您參加運動班已有多長時間？

- 不足六個月
- 7-11個月
- 1-2年
- 3-5年
- 5年以上

16.

請想一想您參加運動班的理由。運動班可能帶來的以下結果對您有多重要？請從1（不重要）到5（很重要）選一個數字，在選中的數字上劃圓圈。

增進身體健康：	不重要				很重要
	1	2	3	4	5
社交往來：	不重要				很重要
	1	2	3	4	5
增進心理健康：	不重要				很重要
	1	2	3	4	5
改善總體健康：	不重要				很重要
	1	2	3	4	5
減輕體重：	不重要				很重要
	1	2	3	4	5
管理慢性病：	不重要				很重要
	1	2	3	4	5
減輕壓力：	不重要				很重要
	1	2	3	4	5

17. 您從目前參加的運動班取得以下每項結果的可能性有多大？請用1（不大可能）到5（很有可能）表示。

社交往來：	不大可能				很有可能
	1	2	3	4	5
增進身體健康：	不大可能				很有可能
	1	2	3	4	5
減輕體重：	不大可能				很有可能
	1	2	3	4	5
管理慢性病：	不大可能				很有可能
	1	2	3	4	5
增進心理健康：	不大可能				很有可能
	1	2	3	4	5
改善總體健康：	不大可能				很有可能
	1	2	3	4	5

減輕壓力：

不大可能

很有可能

1 2 3 4 5

18. 對您來說，與文化背景相同的人一起參加運動班有多重要？

不重要

很重要

1 2 3 4 5 6 7 8 9 10

19. 如果班上與您文化背景相同的會員較多，您參加運動班的次數會增多嗎？

不大可能

很有可能

1 2 3 4 5 6 7 8 9 10

20. 在您看來，年長者要保持理想的健康狀況，應該多久參加一次體育活動？請填空。

年長者應該每星期 _____ 天每天參加 _____ 分鐘的運動。

21.

請從下表中，選出您參加運動班最常面臨的障礙，最多可以選3項：

- | | |
|------------------------------------|-------------------------------------|
| <input type="checkbox"/> 沒時間 | <input type="checkbox"/> 運動班的費用 |
| <input type="checkbox"/> 交通不便 | <input type="checkbox"/> 沒有同伴一起去 |
| <input type="checkbox"/> 家庭責任 | <input type="checkbox"/> 地點不方便 |
| <input type="checkbox"/> 天氣惡劣 | <input type="checkbox"/> 在別處做了足夠的運動 |
| <input type="checkbox"/> 健康問題 | <input type="checkbox"/> 沒有障礙 |
| <input type="checkbox"/> 運動班的時間不方便 | <input type="checkbox"/> 其他： |
- _____
- _____

22.

請選擇最適合您自己情況的運動班的好處，最多可選3項：

- | | |
|--------------------------------|-------------------------------|
| <input type="checkbox"/> 身體健康 | <input type="checkbox"/> 肌肉力量 |
| <input type="checkbox"/> 社交往來 | <input type="checkbox"/> 心理健康 |
| <input type="checkbox"/> 管理慢性病 | <input type="checkbox"/> 沒有好處 |
| <input type="checkbox"/> 減輕壓力 | <input type="checkbox"/> 其他： |
| <input type="checkbox"/> 減輕體重 | _____ |
| | _____ |

23. 在運動班以外的時間，您常參加運動嗎？

- 從未
- 每月一次或更少
- 一個月兩次
- 一星期一次
- 一星期兩次
- 一星期三次
- 一星期四次

24. 您每次約花多少時間？

- 1到15分鐘
- 16到30分鐘
- 31到60分鐘
- 一個小時以上

25. 您參加哪類運動？勾選所有適用項目。

- 步行
- 慢跑/快跑
- 騎腳踏車
- 游泳
- 跳舞
- 家中運動
- 舉重訓練
- 太極或瑜珈
- 有組織的運動
- 其他：

26. 您認為自己有多大把握能做到今後6個月多參加運動（即一個星期的大多數日子都能每天堅持運動至少30分鐘）？

沒有把握

很有把握

1 2 3 4 5 6 7 8 9 10

請用1（強烈不同意）到10（強烈同意）給以下句子評分。

27. 能說英語對我很重要。

強烈不同意

強烈同意

1 2 3 4 5 6 7 8 9 10

28. 我喜歡慶祝加拿大節日。

強烈不同意

強烈同意

1 2 3 4 5 6 7 8 9 10

29. 我把自己看作加拿大人。

強烈不同意

強烈同意

1 2 3 4 5 6 7 8 9 10

30. 有加拿大朋友對我很重要。

強烈不同意

強烈同意

1 2 3 4 5 6 7 8 9 10

31. 加拿大的很多價值觀對我很重要。

強烈不同意

強烈同意

1 2 3 4 5 6 7 8 9 10

多謝您參與調查！非常感謝您抽時間配合我們的工作。

Appendix H:

Chinese Translation of Survey for Non-Exercise Class

Participants

如果您在此耆英中心或其他地方參加運動班（例如水中健身、太極、健身班），請索取另一個版本的調查表。

1.	2. 與您的同齡人相比，您如何評價您的身體狀況？	3. 性別	4. 婚姻狀況
年齡： _____	<input type="checkbox"/> 極好 <input type="checkbox"/> 很好 <input type="checkbox"/> 良好 <input type="checkbox"/> 一般 <input type="checkbox"/> 差勁	<input type="checkbox"/> 男性 <input type="checkbox"/> 女性	<input type="checkbox"/> 已婚 <input type="checkbox"/> 離異 <input type="checkbox"/> 分居 <input type="checkbox"/> 喪偶 <input type="checkbox"/> 單身 <input type="checkbox"/> 在非婚姻關係中
5. 您認為自己屬於哪個族裔？	6. 最高學歷	7. 年收入	
<input type="checkbox"/> 東亞人（中國、香港、日本、韓國、臺灣） <input type="checkbox"/> 南亞人（印度、巴基斯坦、孟加拉國） <input type="checkbox"/> 黑人 <input type="checkbox"/> 西班牙裔 <input type="checkbox"/> 原住民 <input type="checkbox"/> 白人 <input type="checkbox"/> 其他： _____	<input type="checkbox"/> 中學以下 <input type="checkbox"/> 中學畢業 <input type="checkbox"/> 大專證書 <input type="checkbox"/> 大學學位或證書	<input type="checkbox"/> 10,000加元以下 <input type="checkbox"/> 10,000 - 24,999加元 <input type="checkbox"/> 25,000 - 39,999加元 <input type="checkbox"/> 40,000 - 54,999加元 <input type="checkbox"/> 55,000 - 69,999加元 <input type="checkbox"/> 70,000 - 84,999加元 <input type="checkbox"/> 85,000加元及以上	
8. 英語是您的第一語言嗎？	9. 您在加拿大生活多長時間了？	10. 您成為耆英中心的會員已有多長時間了？	
<input type="checkbox"/> 是 <input type="checkbox"/> 否	<input type="checkbox"/> 不到一年 <input type="checkbox"/> 1 - 5年 <input type="checkbox"/> 6 - 10年 <input type="checkbox"/> 11 - 15年 <input type="checkbox"/> 16 - 20年 <input type="checkbox"/> 20年以上 <input type="checkbox"/> 出生在加拿大	<input type="checkbox"/> 不是會員 <input type="checkbox"/> 6個月或以下 <input type="checkbox"/> 6 - 12個月 <input type="checkbox"/> 1 - 3年 <input type="checkbox"/> 3 - 5年 <input type="checkbox"/> 5年以上	
11. 您在家裡的活動量或活動種類有沒有因為長期的身體狀況、心理狀況或健康問題而減少？		12. 您在外面的活動量或活動種類，例如休閒活動或交通，有沒有因為長期的身體狀況、心理狀況或健康問題而減少？	
<input type="checkbox"/> 從未 <input type="checkbox"/> 有時 <input type="checkbox"/> 經常		<input type="checkbox"/> 從未 <input type="checkbox"/> 有時 <input type="checkbox"/> 經常	

13. 您通常多久參加一次運動班？

- 從未
- 一個月一次或更少
- 一個月兩次
- 一星期一次
- 一星期兩次
- 一星期三次
- 一星期四次

14. 您是否有興趣或考慮過參加運動班？

- 是
- 否
- 不確定

15. 如果有興趣，您會對哪類運動班有興趣？

- 有氧健身
- 水中健身
- 跳舞
- 力量/舉重訓練
- 太極或瑜珈
- 其他：_____
- 對任何項目都沒有興趣

16. 如果您要參加運動班，那麼運動班可能帶來的以下結果對您有多重要？請從1（不重要）到5（很重要）選一個數字，在選中的數字上劃圓圈。

增進身體健康：	不重要				很重要
	1	2	3	4	5
社交往來：	不重要				很重要
	1	2	3	4	5
增進心理健康：	不重要				很重要
	1	2	3	4	5
改善總體健康：	不重要				很重要
	1	2	3	4	5
減輕體重：	不重要				很重要
	1	2	3	4	5
管理慢性病：	不重要				很重要
	1	2	3	4	5
減輕壓力：	不重要				很重要
	1	2	3	4	5

17. 如果您參加運動班，那麼您取得以下每項結果的可能性有多大？請用1（不大可能）到5（很有可能）表示。

社交往來：	不大可能				很有可能
	1	2	3	4	5
增進身體健康：	不大可能				很有可能
	1	2	3	4	5
減輕體重：	不大可能				很有可能
	1	2	3	4	5
管理慢性病：	不大可能				很有可能
	1	2	3	4	5

增進心理健康：	不大可能				很有可能
	1	2	3	4	5
改善總體健康：	不大可能				很有可能
	1	2	3	4	5
減輕壓力：	不大可能				很有可能
	1	2	3	4	5

18. 如果您參加運動班，那麼對您來說與文化背景相同的人一起參加運動班有多重要？

不重要 很重要

1 2 3 4 5 6 7 8 9 10

19. 在您看來，年長者要保持理想的健康狀況，應該多久參加一次體育活動？請填空。

年長者應該每星期 _____ 天每天參加 _____ 分鐘的運動。

21. 請從下表中，選出您參加運動班最常面臨的障礙，最多可以選3項：

<input type="checkbox"/> 沒時間	<input type="checkbox"/> 運動班的費用
<input type="checkbox"/> 交通不便	<input type="checkbox"/> 沒有同伴一起去
<input type="checkbox"/> 家庭責任	<input type="checkbox"/> 地點不方便
<input type="checkbox"/> 天氣惡劣	<input type="checkbox"/> 在別處做了足夠的運動
<input type="checkbox"/> 健康問題	<input type="checkbox"/> 沒有障礙
<input type="checkbox"/> 運動班的時間不方便	<input type="checkbox"/> 其他： _____

22. 請選擇最適合您自己情況的運動班的好處，最多可選3項：

<input type="checkbox"/> 身體健康	<input type="checkbox"/> 肌肉力量
<input type="checkbox"/> 社交往來	<input type="checkbox"/> 心理健康
<input type="checkbox"/> 管理慢性病	<input type="checkbox"/> 沒有好處
<input type="checkbox"/> 減輕壓力	<input type="checkbox"/> 其他： _____
<input type="checkbox"/> 減輕體重	_____

22. 在運動班以外的時間，您常參加運動嗎？

- 從未
如果回答「從未」，請跳到第25題
- 每月一次或更少
- 一個月兩次
- 一星期一次
- 一星期兩次
- 一星期三次
- 一星期四次

23. 您每次約花多少時間？

- 1到15分鐘
- 16到30分鐘
- 31到60分鐘
- 一個小時以上

24. 您參加哪類運動？勾選所有適用項目。

- | | |
|--------------------------------|---------------------------------------|
| <input type="checkbox"/> 步行 | <input type="checkbox"/> 舉重訓練 |
| <input type="checkbox"/> 慢跑/快跑 | <input type="checkbox"/> 太極或瑜珈 |
| <input type="checkbox"/> 騎腳踏車 | <input type="checkbox"/> 有組織的運動 |
| <input type="checkbox"/> 游泳 | <input type="checkbox"/> 其他：
_____ |
| <input type="checkbox"/> 跳舞 | _____ |
| <input type="checkbox"/> 家中運動 | _____ |

25.

您認為自己有多大把握能做到今後6個月多參加運動（即一星期的大多數日子都能每天堅持運動至少30分鐘）？

沒有把握

很有把握

1 2 3 4 5 6 7 8 9 10

請用1（強烈不同意）到10（強烈同意）給以下句子評分。

26. 能說英語對我很重要。

強烈不同意

強烈同意

1 2 3 4 5 6 7 8 9 10

27. 我喜歡慶祝加拿大節日。

強烈不同意

強烈同意

1 2 3 4 5 6 7 8 9 10

28. 我把自己看作加拿大人。

強烈不同意

強烈同意

1 2 3 4 5 6 7 8 9 10

29. 有加拿大朋友對我很重要。

強烈不同意

強烈同意

1 2 3 4 5 6 7 8 9 10

30. 加拿大的很多價值觀對我很重要。

強烈不同意

強烈同意

1 2 3 4 5 6 7 8 9 10

多謝您參與調查！非常感謝您抽時間配合我們的工作。

Appendix I:

Chinese Translation of Informed Consent Form

知情同意

您將配合完成的這份問卷是西蒙菲莎大學碩士學位研究報告的一部份。您所參與活動的耆英中心已經批准我們在此進行問卷調查活動。

研究人員：Karina Hackett, 老年學系研究生

研究項目：探索文化背景與老年人集體性運動的動機與障礙

研究目標：這項研究的目標在於探索老年人參加包括運動課程在內的體育活動的動機，障礙，以及他們所處的文化背景對以上方面的影響。

您將協助我們完成：一份在10到15分鐘內可以完成的問卷，涉部份個人信息以及您的體育活動習慣。您的參與是完全自願的，您可以隨時終止參與問卷調查活動。

終止參與調研：您可以因任何理由，在任何時間終止參與問卷調查。終止參與問卷調查將不會對您造成任何負面影響。

隱私保護：您的問卷回答結果將是機密的，您所簽署的知情同意書將會與您的匿名問卷嚴格區分管，不會與您的個人信息有任何關聯。您的姓名將不會被用於任何報告或此調研的出版。

對調研活動有疑問：如果您對此調研活動本身或者您在此活動的參與性質有任何問題，抑或您有興趣知道本次調研的成果，請撥打778-230-6849，或者以郵件方式KarinaH@sfu.ca聯繫Karina Hackett。除非您主動要求，否則我們將不會在您參與問卷調查后主動聯繫您。

有關您作為調研參與者所有的權益，請聯繫

Hal Weinberg, Director

Office of Research Ethics

Simon Fraser University

Burnaby, BC V5A 1S6

778-782-6593 / Hal_Weinberg@sfu.ca

以下簽名表示您同意參加問卷調查活動

參與者簽名：

日期：

調研人員簽名：

日期：