Exploring Aging Stereotypes and Age-Specific Physical Activity Factors Among Active Older Adults

by

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Submitted in partial fulfilment of the requirements
for the degree of Master of Arts

at

Dalhousie University
Halifax, Nova Scotia
July 2017

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ABSTRACT

Physical activity (PA) in later life acts as a modifiable and prevention factor of many chronic diseases, however the majority of older adults are inactive. Age stereotypes are an important psychosocial barrier to PA. To date, research has mainly focused on negative age stereotype, in inactive or competitive older adults, using quantitative-and-individually focused methodologies. The objective of this study was to explore aging beliefs in active older adults (i.e., age stereotypes), and the age-specific factors influencing the adoption and maintenance of PA using the social-ecological model. Results demonstrate participants believed aging-related decline to be both inevitable and controllable, and revealed multi-level age-specific PA factors. This study provides new perspectives on the multi-level age-specific factors influencing later-life PA. These results suggest that these age-specific multi-level factors should be considered and incorporated when implementing interventions (i.e., programs and/or policies) to increase PA uptake and support the maintenance of PA in later life.

LIST OF ABBREVIATIONS USED

PA .....Physical activity

CSEP .....Canadian Society for Exercise Physiology

WHO.....World Health Organization

SET..... Stereotype Embodiment Theory

ACKNOWLEDGEMENTS

With sincere and heartfelt appreciation I would like to thank the people that have supported me during the completion of this project.

First and foremost I would like to thank Dr. Brad Meisner for your unwavering support, wisdom, and generosity. Your passion for education and your thirst for knowledge have shaped the researcher I am today. While these pasts few years have at times been very challenging, both academically and personally, your compassion and dedication allowed me to persevere. I could not have dreamed a better supervisor - a million times, thank you.

Thank you to my thesis committee – Dr. Laurene Rehman and Dr. Sara Kirk. Your knowledge and insights were key to help me clarify my thoughts and polish my work.

To the participants of this study, who graciously offered up their time, thank you. Without your interest, and participation, this project would not exist. It was a pleasure to share your experiences and perceptions.

I would also like to thank members of REACH-U, and the graduate students of the School of Health and Human Performance. Thank you for being a group of inspirational colleagues and for sharing this journey with me.

Lastly, to my partner – my family – my friends thank you. Thank you for listening to me talk about this project day in and day out, and for your smiles and encouraging words. Mom, thank you for managing many breakdowns, and always knowing how to turn my tears into laughter. Matthew, thank you for your endless love and support, and for getting me up and moving after hours of staring at the computer.

Thank you.

CHAPTER 1: INTRODUCTION

Canada's population is aging. This year, in 2016, baby boomers (born from 1946 to 1964) will start to celebrate their 70th birthday. The current health implications of this demographic shift are paramount as older adults are vulnerable to negative health outcomes such as cardiovascular disorders, and cognitive decline (PHAC, 2014). Changes in behaviour, such as engagement in PA (PA) (specifically higher intensity PA), are proven to reliably prevent, improve, and support the maintenance of numerous negative health outcomes (Warburton, Nicol, & Bredin, 2006). However, the majority of older adults remain inactive and/or spend large amounts of their waking hours in sedentary behaviours (Crombie, et al., 2004; Harvey, Chastin, & Skelton, 2015). Moreover, adherence to community-based PA programming is minimal, even when such opportunities exist (Farrance, Tsofilou, & Clark, 2015). To help address this public health concern, factors contributing to PA disengagement are being explored. One identified factor that has emerged from the literature is the impact of age stereotypes on PA (or inactivity) in later life.

Age stereotypes are generalized beliefs about aging and/or older people (Levy, 2003). When individuals age and begin to associate with the "older adult group", age stereotypes are internalized and become *self-stereotypes*, these beliefs then exert influence on health related outcomes, performance, and behavioural processes (Levy, 2009). More specifically, if an older adult believes that physical decline, frailty, and functional dependence is a "natural" occurrence with aging, then the value, importance, or age-appropriateness of engaging in PA will be reduced or perhaps lost entirely (Levy & Myers, 2004). Hence, age stereotypes pose an important psychosocial barrier to PA in later life and may explain, at least partially, low levels of PA

engagement in this population. Conversely, positive age stereotypes are shown to improve physical function, as well as time spent in, and frequency of, PA (Meisner, Weir, & Baker, 2013; Sarkisian, Prohaska, Davis, & Weiner, 2007; Wolff, Warner, Ziegelmann, & Wurm, 2014).

While positive age stereotypes present an opportunity for the promotion of PA, research has primarily focused on the influence of negative age stereotypes in inactive older adults, and of the experiences of aging from the perspective of elite aging athletes (e.g., Diogini, Horton, & Baker, 2013; Stewart, Chipperfield, Perry, & Weiner, 2012). To date, no research has explored this topic in older adults who are active (but not elite athletes). This is an important gap in the literature given that: a) a deficit focused approach neglects the perspectives of active older adults who are engaging in PA and fails to take into consideration the apparent relationship between high expectations regarding aging (i.e., positive age stereotypes) and strenuous activities (Meisner, et al., 2013), and b) the PA engagement of masters athletes are well above what is recommended by current Canadian PA guidelines, and do not adequately represent the PA possibilities of the aging population. Exploring active older adults who engage in moderate- to vigorous- PA is therefore important to offer a positive and realistic representation of PA and aging.

Research exploring age stereotypes and PA has, as of yet, been mainly quantitative (e.g., cognitive-behavioural techniques), and individually focused (self-reported surveys). Although these methods outline the relationship between age stereotypes and PA, there is a noted lack of qualitative methodology and of the multidimensional perspectives of aging (Diogini, 2015; Meisner & Levy, 2016). Studies using qualitative methodology within theoretical frameworks that allow exploration beyond the individual, such as the social-ecological model (McLeroy,

Bideau, Steckler, & Glanz, 1988), are needed to offer new information on the complexities of aging beyond the individual.

Purpose of Study

As such, the purpose of this study is to: a) explore beliefs about aging (both positive and negative) in a population of active older adults, and b) to make recommendations for multi-level interventions that promote PA engagement in later life. By exploring age stereotypes in active older adults (i.e., those who embody the possibilities that can be achieved in PA with aging), this research aims to discover the perceptions and experiences of aging that support optimal health outcomes in later life from the individual to the population level. Furthermore this study will offer a more comprehensive understanding of age-specific factors influencing PA by exploring this problem through a multilevel lens. Overall, this study will address some gaps and limitations of the current literature on age stereotypes and later life PA factors.

Significance of the Study

This study is significant, as active older adults have, to date, been excluded from the current literature on age stereotypes and PA. Exploring the perspectives of active older adults is important given the seeming relationship between expectations regarding aging and PA (Meisner et al., 2013), and because these are the individuals who are currently engaging in the health promotion behaviour we are seeking to increase in the aging population. Understanding how they have benefitted from facilitators and/or overcome barriers can help inform multi-level efforts to increase PA in later life from the individual- to the population-level. Informing multi-level interventions requires the use of theoretical models that adequately capture multi-level factors. As such, the social-ecological model will be used as a theoretical framework.

Furthermore, this study is significant, as it will grow the current knowledge of aging beliefs and PA, and address some of the gaps found in the current literature. The use of qualitative methodology is significant as it offers an alternative to the current quantitative (e.g., Wurm, Tesch-Römer, & Tomasik, 2007) and individually-focused literature (e.g., Meisner, et al., 2013). Data generated through qualitative inquiry is well suited to address the subjective and complex nature of aging (Diogini, 2015, Meisner & Levy, 2016), and allows to uncover new aspects of later life, which have previously been discounted for aging adults (Lowton, 2012). Lastly, unlike quantitative methods, qualitative inquiry allows a deeper understanding of behaviours in the context in which they occur (Glanz, 2015), and is therefore valuable when informing the construction of interventions addressing contextual factors influencing behaviour.

Study Design

To address methodological gaps in the literature, this research study will use a qualitative methodology. Qualitative description will be used as the analytical framework for the purpose of exploration. While qualitative description is often removed from theoretical overtones to allow the data to speaks for itself and present a "rich, straight description of an experience or event" (Neergaard, Olesen, Andersen, & Sondergaard, 2009, p. 2), the present study opts to use the social-ecological model (McLeroy et al., 1988) as a theoretical framework for inquiry. The multi-level analysis gained from this framework is invaluable when making recommendations to practitioners and policy makers alike.

Data will be collected through one-on-one semi-structured interviews with approximately fifteen participants. In accordance with qualitative description methodology, purposeful and snowball sampling will be used as the recruitment strategy (Neergaard, et al., 2009;

Sandelowski, 2000). Older individuals who are physically active will be eligible to participate in this study. PA is a broad term that can be interpreted in many different ways; however, for the purpose of this study, the category of physically active older adults will contain those who are engaging in at least the recommended aerobic PA guidelines according to the Canadian Society for Exercise Physiology (CSEP, 2011). That is, older adults (i.e., age 65+) who are engaging in more than 150 minutes, two and a half hours, of moderate-to vigorous-intensity aerobic activity weekly.

Importance and Relevance to Health Promotion

This project is important and relevant to health promotion as physical inactivity has a significant impact on older adult health. The inactivity levels of this population make them vulnerable to developing multiple, yet preventable, chronic conditions (PHAC, 2014). Discourse regarding the public health "aging issue" is problematic as these adverse aging health outcomes are not inevitable processes of aging, but rather the result of other determining factors (e.g., poor diet/nutrition, smoking, lack of PA), which are modifiable. One of these factors is age stereotypes. Age stereotypes are harmful to health-related outcomes among older adults as they alter ones' beliefs of their PA abilities, which ultimately shape PA behaviour (Levy & Myers, 2004; Wurm et al., 2007). Therefore, this research emphasizes the importance of exploring psychosocial factors for older adult health. By challenging misconceived notions of what is appropriate PA behaviour in old age, older adults may be more inclined to adopt PA, and chronic conditions may be prevented or maintained more effectively.

Another way this study is relevant to health promotion is the possibility to increase older adults' control over their perceived PA abilities and behaviours. The World Health Organization (WHO) defines health as:

> "The process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment". (WHO, 1986, p. 1)

By challenging common myths and misconceptions regarding aging this project hopes to enable older adults to engage in those PA behaviours they may have previously believed to be "age appropriate".

Lastly, the social-ecological model has been shown to be an effective theoretical framework for health promotion research (McLeroy, et al., 1988). By exploring the multidimensionality of age stereotypes and PA this study will generate data to make informed recommendations regarding the promotion of PA. The hope is that these recommendations will help the development of future PA programming and health policy that support later life PA.

Summary

This chapter has given a broad overview of the upcoming chapters. Although the benefits of PA are well known and documented, age stereotypes are a serious psychosocial barrier to this health promoting behaviour in later life (Meisner, 2012; Meisner & Levy, 2016). This research project will explore both positive, and negative, age stereotypes in a sample of active older adults through the use of qualitative methodology. Moreover, this project will explore age stereotypes from the individual- to the population-level using the social-ecological model of health

promotion. Given the possibility of enabling older adults to engage in PA this research has important implications for health promotion given that greater knowledge of psychosocial factors for health may help delay or prevent the onset of chronic conditions often seen in later life. Moreover, data generated from this project hopes to challenge false beliefs regarding aging and make recommendations for effective PA programming and policy to support PA in the aging population.

CHAPTER 2: LITERATURE REVIEW

In 2016, baby boomers (born from 1946-1964) will start to celebrate their 70th birthdays. As well, Canadians are now waiting longer to have children, and birthrates have been on a steady decline since the end of the 1960s (Statistics Canada, 2016). The combination of these two factors (greater life expectancy and declining birthrates) is creating a demographic shift towards a top-heavy population age structure within many industrialized countries (Lee & Reher, 2011). In fact, Canadian older adults aged 65+ now outnumber children under the age of 15 (Statistics Canada, 2015). This change is especially salient in the Atlantic Provinces as they are home to a disproportionate amount of the aging population compared to the rest of Canada (Statistic Canada, 2015). This trend is even more pronounced for Nova Scotia. This is the province with the highest ratio of persons 65 years of age and older (1.35 persons over the age of 65 to every one child 0-14 years of age compared to the national average ration of 1.01 persons over the age of 65 to every one child 0-14 years of age).

Implications of the Growing Aging Population

The implications of this demographic shift are paramount given the relationship between older age and the incidence of many chronic conditions. Cardiovascular disorders (CVD) death rates are highest among those aged 65 years of age and older (PHAC, 2009), chances of developing type 2 diabetes drastically increases after the age of 40 – incidence rates are highest between the ages of 70 to 79 (PHAC, 2011), and those aged 80+ are the primary users of health services for mental illness (PHAC, 2015). Given this forecasted rise in prevalence and incidence of chronic conditions, public health efforts have focused on creating strategies to better the health of the aging population.

Given the evidence of the health benefits of PA, increasing uptake of PA in later life is one such strategy. Indeed, PA reliably improves, and supports the maintenance of, numerous health outcomes and conditions even among older adults who typically have the poorest states of health and the lowest PA rates across all age cohorts (Ceolim & Menna-Barretto, 2000; Chodzko-Zajko, Schwingel, & Park 2008; Meisner, Dogra, Logan, Baker, & Weir, 2010; Warburton, et al., 2006). Moreover, there is evidence to suggest significant cost effectiveness of PA programming through increases in quality adjusted life years (Windle, Hughes, Linck, Russell, & Woods, 2010). Thus, this age group has the most to gain from sustained PA participation.

Benefits of PA in Later Life

It is established that active aging is key to optimal health in later life. Keeping active into old age is widely researched and is known to be beneficial for multiple domains of health. More specifically, biological benefits of PA in later life include increased sleep quality (Ceolim & Menna-Barretto, 2000), increased cardiovascular endurance, muscle strength, flexibility, balance and coordination, walking speed, and reduce the risk of falls (Hill, Hunter, Batchelor, Cavalheri, & Burton, 2015). Continued engagement in PA also prevents several chronic diseases such as cardiovascular disorders, diabetes mellitus, cancer, and osteoporosis (Heckman & McKelvie, 2008; Warburton et al., 2006). Furthermore, these results follow a linear relationship such that increases in PA lead to increases in biological health (Warburton et al., 2006). Conversely, reports of low PA engagement are significantly associated with low functional abilities (Meisner, et al., 2010).

Psychological benefits of PA in later life include reduced stress and anxiety (Choszko-Zajko et al., 2008), as well as lower levels of depression (Heinzel, Lawrence, Kallies, Rapp, & Heissel, 2015). Participating in PA interventions also has positive health related impacts through increased self-efficacy, view of self, and overall wellbeing (Netz, Wu, Becker, & Tenenbaum, 2005). Moreover, PA engagement often offers the opportunity for older adults to be social with others, the social benefits of PA have important implications for psychological health that persist even after the PA participation takes place (Chodzko-Zajko et al., 2008).

Cognitive benefits of PA in later life include increased cognitive function and decreased risk of cognitive decline (Fratiglioni, Paillar-Bord, & Winblad, 2014). Moreover, older adults who engage in PA have better working memory than those who do not (Chang, Huang, Chen, & Hung, 2013). Lastly, PA has shown to reduce the rate of cognitive decline in older adults who are at risk of developing cognitive disorders (Kramer, Erickson, & Colcombe, 2006), for these reasons PA is recently established a an effective non-pharmacologic intervention for later life cognitive decline (Smart et al., 2017)

Health Promotion for PA in Later Life

In light of these findings, a focus on "active aging", emphasizing the value of PA as behavioural medicine for optimal health, healthy aging, and overall well-being in later life, has appeared as a priority area for many international, national, and provincial health- and/or aging-related authorities. Despite these efforts, data from the world health survey indicates a marked decrease in the number older adults meeting PA guidelines after the age of 60 (Bauman, Merom, Bull, Buchner, & Fiatarone Singh, 2016). National data indicates that approximately 12.5% of the Canadian population aged 60 to 79 met PA guidelines (as described above) (Statistics

Canada, 2015). Given the evidence, such low levels are alarming as biological, psychological, social, and societal benefits of PA are under- or un-realized at personal to public levels.

Globally, the World Health Organization (WHO) has developed a strategy and action plan on aging and health (WHO, 2016), which include increasing PA levels. Canada as a nation has placed the changing demographic as a priority area for health. PA policies have been implemented on a national scale to maximize the health of the aging population. One such initiative are the evidence-based Canadian PA guidelines created by CSEP. The CSEP guidelines have been separated by age group (aged 5 – 11 years; aged 12 – 17 years; aged 18 – 64 years; aged 65 years or older). Guidelines for older adults were guided by the relationship between PA and functional independence, and cognitive function, in older adults. Recommendations were made according to the types, volume, and intensities of PA related to higher functional status (Tremblay et al., 2011). These are at least 150 minutes of moderate-to-vigorous intensity aerobic PA per week, in bouts of 10 minutes or more, and muscle and bone strengthening performed twice weekly (CSEP, 2011).

Emphasis on PA is also apparent in provincial health strategies. Within Nova Scotia, the Positive Aging Strategy (2005) recognizes the benefits of PA for older adults and strongly supports health-promoting initiatives that expand community-based PA programming. For example, some goals are to increase active transportation, to encourage participation in leisure and active living, to develop an inventory for Active Living programs, and to create supportive communities. Although health promoting PA initiatives address individual responsibility and attempt to create physical and social environments that facilitate PA engagement, what has not been addressed are the psychosocial processes of aging itself (e.g., age perceptions).

The Need for a Psychosocial Approach in Health and PA Promotion in Later Life

Failing to address beliefs about aging is an important oversight considering there is a large, and growing, body of literature that supports the notion that beliefs (i.e., stereotypes) regarding the aging process have a significant impact on physical and functional performance, as well as health behaviours and outcomes among older adults. Popular aging stereotypes that present the older adult as frail or weak pose a challenge, as they lessen the physical abilities of this age group.

For example, using data from the Successful Aging Study (Sage stereotype), a branch of the Aging in Manitoba study, Stewart et al., (2012) explored whether the common belief 'to be old is to be ill' had negative consequences for the experience of health symptoms, the performance of health maintenance behaviours, and for longevity of older adults. Results from the multiple regression analysis found that those older adults who attributed 'old age' as the cause of poor health had: a) more negative experiences of health symptoms, independently of their objective health status, b) engaged in less health maintenance behaviours (e.g., PA, getting enough sleep, getting regular check-ups), and c) doubled their probability of death at a two-year follow up even after controlling for socio-demographic variables, severity of chronic conditions, functional restriction, and health locus of control. The above findings are alarming given that older adults are more likely to rate "old age" as the greatest contributor to chronic illness before many other, more determining factors (e.g., genetics, lifestyle, unhealthy behaviours) (Stewart et al., 2012).

Similarly studies have shown that older adults who report low expectations of aging (e.g., who expect decline and ill health) are less likely to engage health promoting behaviours, and

have lesser health than their counterparts who report high expectations of the aging process. A study by Wurm, Tesch-Römer, & Tomasik (2007) established a positive relationship between positive views on aging and higher engagement in PA. Data on frequency of PA, measures of positive views on aging, and physical health, demonstrates that views on aging contribute to higher levels of PA even in populations of older adults who have low levels of health. That is, older adults who had positive views on aging and low physical health were more likely to engage in PA than those with negative views on aging and high physical health. Comparable findings were found in a recent study, by Breda and Watts (2017), examining the influence of expectations regarding aging on PA participation and physical functioning in older adults. Participants from this study were over the age of 60 and had good cognitive functioning, survey results indicate that older adults with more positive expectations regarding aging (higher scores on the expectation regarding aging scale) had higher levels of PA and reported higher-levels of physical functioning.

These results demonstrate that the interpretation of the causality of health or illness has a vital role in the reasoning and motivation to engage in PA, when illness is attributed to aging as a biological process beyond one's control, the significance of preventing or maintaining health diminishes greatly. This is important as health promotion aims to enable people "to increase control over, and to improve, their health" (WHO, 1986, p.1). Challenging current myths and misconceptions of aging, such as those which present physical decline and disease as unavoidably linked with aging, has the potential to restore older adults' perceived control over their health and motivate the maintenance, or uptake, of preventative health behaviours, such as PA.

Age Stereotypes

Myths and misconceptions of aging are reflected as common age stereotypes, which can be understood as generalized beliefs about aging and/or older people (Levy, 2003; 2009). Age stereotypes are largely perpetuated by structural systems that continue to under-represent and/or represent negatively older adults. For example, the images of older adults in advertisement, television, books, and media shape perceptions aging and of the aging population (Lee, Carpenter, & Meyers, 2007; Mason, Darnell, & Prifti, 2010; Mason, Kuntz, & McGill, 2015; Zhang, Harwood, Williams, Ylänne-McEwan, Wadleigh, & Thimm, 2006)

Age stereotype can be both positive and negative in content. Popular positive age stereotypes present older adults as friendly, sincere, good natured, and warm; Whereas popular negative age stereotypes represent older adults as frail, weak, incompetent, and forgetful (Cuddy & Fiske, 2002). Unfortunately, in Western societies, negative age stereotypes largely outnumber positive ones (Kite, Stockdale, Whitley, & Johnson, 2005), are shown to have greater consequences on older adult health than positive age stereotypes (Meisner, 2012).

Moreover, age stereotypes are of particularly interest for health researchers, not only because of their impact on health outcomes in light of the aging population, but also because they differentiate themselves from other stereotypes. Unlike sex- and race-based stereotypes, age stereotypes will eventually apply to *all* members of society who have the opportunity to grow old. This is significant given all members of society will eventually move into the age group whom they have stigmatized throughout their lifetimes (Meisner & Levy, 2016).

According to Levy's (2003; 2009) Stereotype Embodiment Theory (SET), individuals develop self-perceptions of aging from continued exposure to age stereotypes across their

lifespan (Levy, 2003, 2009; Levy, & Meisner, 2016). When an individual begins to associate with the older adult group, internalized age stereotypes become *self*-stereotypes and are then shown to have deleterious influences on health-related outcomes, performance, and behaviours. Gaining a better understanding of aging beliefs, and what influence they exert on health processes can guide research into age stereotypes resiliency and PA promotion in later life. The implications of age stereotypes on the health of older adults give reason to explore further the specific ramification of both positive and negative age stereotypes.

Health Implications of Positive and Negative Age Stereotypes

As previously stated, age stereotypes are a psychosocial factor influencing later life health-related outcomes, performance, and behaviour. The following paragraphs outline previous research exploring the health implications of both positive and negative age stereotypes. Firstly the health implications of negative age stereotypes are discussed, followed by the limited but compelling evidence of the health implications of positive age stereotypes.

Negative age stereotypes. Experimental research, in laboratory settings, have found behavioural changes in older adults following exposure to both implicit (operating below levels of consciousness) and explicit (operating above levels of consciousness) age stereotype primes (Levy, Pilver, Chung, & Slade, 2014). Implicitly priming older adults with age stereotype has deleterious impacts on physical and cognitive functions. In an experimental study by Levy, Hausdorff, Hencke, and Wei (2000), community-dwelling older adults were randomly assigned to either positive or negative age stereotypes conditions. Those who were primed by negative age stereotypes had greater cardiovascular stress than those primed with positive age stereotype.

Cognitive functions as measured by performance scores on memory tasks have also been found to decrease following exposure to negative age stereotype (Levy, 1996). Furthermore, priming older adults with negative age stereotype can go so far as to impact their will to live. In an experimental study Levy, Ashman, and Dror (2000) participants were assigned to the negative age stereotype condition were less likely to accept lifesaving interventions in a hypothetical medical scenario compared to participants assigned to the positive age stereotype condition.

Experimental research has been able to demonstrate the implications of age stereotype for health outcomes, however a sizable limitation is the experimental nature of these experiments and the controlled laboratory setting. Although these settings can control for extraneous variables, extrapolating these findings to real world settings is limited (Creswell, 2014). Other methods of measuring age stereotype impact have been through self-reported measures of aging perceptions.

Self-reported measures of aging perceptions have predictive power for a wide array of health outcomes such as physical functioning (Levy, Slade, Kunkel, & Kasl, 2002; Sargent-Cox, Anstey, & Luszcz, 2012), cardiovascular health (Levy, Zonderman, Slade, & Ferrucci, 2009), longevity (Kotter-Grühn, Kleispehn-Ammerland, Gerstorf, & Smith, 2009), as well as many health behaviours (Levy, & Myers, 2004). Despite the large majority of the research on age stereotype has focused on negative age stereotype, there is evidence to support the idea that positive age stereotype have significant beneficial implications for numerous health outcomes.

Positive age stereotypes. Levy (1996) used priming methods to determine the impact of positive and negative age stereotype on performance in a memory test. A group of older adults was primed with negative stereotype (incompetent, decrepit, diseased), while the other was

primed with positive aging stereotypes (e.g., guidance, sage, and accomplished). Those assigned to the positive age stereotype condition performed significantly better on the memory task than those assigned to the negative age stereotype condition. A similar study establishing the impact of age stereotypes on walking speed gait in older adult participants found comparable results (Hausdorff, Levy, & Weiss, 1999). A main criticism of this research is that they were conducted in laboratory settings, which may not be reflective of the everyday impact of age stereotypes.

Studies using self-reported measures of aging perceptions found positive self-perceptions of aging lead to greater engagement in health behaviours (e.g., eating a proper diet, exercise, medication compliance) (Levy & Myers, 2004; Meisner & Baker, 2013). It is important to note, however, that one study found no changes in performance in older adults who are primed with positive age stereotypes (Stein, Blanchard-Fields, & Hertzog, 2002) and other found a decrease in age satisfaction following exposure to positive age stereotypes, which they attributed to the result of social comparison (Kotter-Grühn & Hess, 2012). Given the importance of both positive and negative age stereotypes on the health behaviours of older adults, and the importance of PA for optimal health in later life there is value in investigating both positive and negative age stereotypes, and exploring positive age stereotypes further.

Implications of Age Stereotypes on PA Behaviour

As mentioned above, the connection between age stereotypes and health behaviours has been established. PA is an important health behaviour with many benefits. Research on age stereotypes has begun to explore the connection between age stereotypes and PA in later life. Walking has often been used as a measure of physical function as it is necessary to independently and to complete many activities of daily living (ADLs). In a randomized

intervention study by Hausdorff, et al., (1999), healthy community dwelling older adults were assigned to either a positive, or negative, age stereotype group. Participants were instructed to play a computer game, while they played prime words were flashed upon the screen at a speed too fast to be consciously recognized. Following this game, researchers measured the time it took for participants to walk down the hall. Those who were assigned to the positive age stereotype condition had faster walking speed than those assigned to the negative age stereotype condition. Moreover, results from a study by Robertson, Savva, King-Kallimanis, and Kenny (2014) suggest age stereotype may have longitudinal implications on physical functioning. Self-reports of aging perceptions were collected over a two-year period. They found older adults who reported lower self-perceptions of aging at baseline had slower walking speed than those who reported higher self-perceptions at a two-year follow up.

Applied research suggests targeting positive views on aging, within the context of a PA intervention, can increase levels and frequency of PA (Sarkisian, et al., 2007; Wolff, et al., 2014). In a pre-post community-based pilot study, Sarkisian, et al., (2007) investigated whether adding an educational component to an exercise class, which teaches older adults that physical decline is due to lifestyle factors not the aging process itself, would increase walking levels of sedentary older adults. This added component was shown to be lead to a rise in both aging expectations and walking levels. Similarly, a randomized controlled study by Wolff et al., (2014) evaluated the influence of targeting positive views on aging in a PA intervention. Older adults were randomly assigned to one of four groups: a) a PA intervention with an added 'positive views on aging' component, b) a PA intervention without 'positive views on aging' component, c) an active control group (targeted volunteerism as behaviour not PA), and d) a passive control

group. All groups took part in an intervention aimed to increase PA. The positive views on aging group benefitted from an additional intervention challenging misconceptions of aging, and were also prompted with positive views on aging to reconstruct negative interpretations into positive ones. Results showed those in the positive views on aging group had more positive attitudes towards aging following the intervention, and that this change as associated to higher PA levels. Results from these studies demonstrate the possibility of applying age stereotype knowledge to community-level interventions, and offers an avenue for real world application and meaningful change of PA behaviour in community dwelling older adults.

While there is little qualitative research exploring the specific impact of age stereotypes on PA participation, exploring factors influencing later life PA suggests perceptions of aging exert influence on the adoption and maintenance of PA. A recent study by Schmidt, Rempel, Murray, McHugh, and Vallance (2016) found aging perceptions of family members of older rural Canadians influenced PA. While some participants were encouraged by family to engage in PA, others were cautioned and discouraged from this behaviour because of family members age-related concerns (e.g. "you're not 59 anymore" p. 5).

This is positive news for health care professionals and policy makers alike as they suggest targeting positive age stereotypes may increase the physical function and PA levels of older adults. However, to create high-level interventions that target the root of the problem it is necessary to determine what age stereotypes are present in real world environments. There is currently a lack of qualitative study describing older adults' perceptions of, and experience with, age stereotypes and PA. Specifically the perspectives of active older adults who are engaged in the health promoting behaviours we aim to promote.

Currently qualitative research in this field has explored perceptions of aging Masters athletes (older elite athletes). Diogini, et al., (2013) investigated factors that facilitate sport participation among older adult athletes. They found that this population negotiates negative age stereotype, rather than embodying them, through engagement in PA for personal empowerment and/or to negate the aging process. Although masters athletes largely defy what is expected of older adults in terms of PA performance and abilities, the competitive nature of their sport, along with higher levels of PA than is recommended to the average ager, and therefore do not accurately represent the experience of those older adults who are physically active but not competitive or elite athletes.

Furthermore, research suggests the experience of masters' athletes may not be transferable to the rest of the older adult population. Horton, Baker, and Deakin (2007) conducted semi-structured interviews to explore reactions to exemplar role models of aging. Participants were shown the picture of Ed Whitlock, an elite septuagenarian runner, many found the image to be "too extreme" and an inappropriate role model. Horton et al., (2007) state some participants found him to be a good role model, however these positive accounts really only presented feelings of admiration. Although admiration may be inspirational they did not initiate action towards PA uptake. Similarly consumer marketing research, attempting to motivate older adults to engage in PA through visual imagery, found the most effective images are those of "ordinary people doing ordinary things". Focus group participants preferred images that presented images of individuals who they could relate to, many reported being intimated by images of "super fit" older adults (Ory, Hoffman, Hawkins, & Mockenhaupt, 2003).

To date, no research has investigated age stereotypes in those adults who continue to

engage in PA at, or above, the recommended Canadian PA guidelines but who are not competitive or elite. Exploring active older individuals is important as they represent a more realistic representation of the PA possibilities in later life. Moreover, research exploring the population of older adults who engage in higher-intensity PA is important as there appears to be a relationship between high expectations regarding aging (i.e., positive age stereotypes) and strenuous activities (Meisner, et al., 2013). These findings suggest that targeting age stereotypes may be more important when attempting to increase high frequency, duration, and/or intensity levels of PA among older adults.

Overall, there is a need to explore the presence and experience of age stereotypes and PA from active older adults to further understand the meanings of aging, as well as a need to uncover what aging representations occur in their lived environments to shape or create these meanings of aging. Moreover, there is a need to explore and clarify what positive age stereotypes facilitate PA behaviour, and what negative age stereotypes act as a PA barrier, but may be overcome, by this group of active older adults. Finally the extant of the research on age stereotypes has been individually focused, health promoters would benefit from a multi-level perspective in order to create coordinated action plans for PA strategies.

The Social-Ecological Model

To expand the scope of research beyond the individual, this research will use the social-ecological model as a theoretical framework. The social-ecological model of health promotion outlines five levels of interactions: a) intrapersonal (e.g., attitudes, knowledge and behaviours); b) interpersonal (e.g., family, friends, social networks); c) community (e.g., settings); d) institutional (e.g., organizations and social institutions); e) public policy (e.g., national and

provincial laws and legislation) and is known to be an effective model for research on health behaviours (McLeroy, Bibeau, Steckler, & Glanz, 1988).

Sallis, Owen, & Fisher (2015) have outlined four core principles of ecological models of health behaviours. The first is the influence of multiple levels of factors on health behaviours. The second notes the influence of factors on health behaviours across these levels. For example, when thinking of PA behaviour in later life, an older adult with a chronic condition (individual level), little social supports (interpersonal level), and reduced accessibility to sport facilities (community level) is less likely to be active than his counterpart who has little physical impairments, strong friendships with other physically active older adults, and lives across the street from a park and a community center. The third stipulates interventions that solely target one level are unlikely to be successful. Rather, the strength of ecological models is their ability for multi-level interventions. The fourth indicates that ecological models are most effective when they are adapted to fit the needs of a specific behaviour. From this perspective, promoting PA as a health behaviour in later life is contingent on a comprehensive understanding of the intersection of these multiple level factors. Therefore, for the purpose of this research project is to explore multiple-level age-specific factors influencing PA as a health behaviour, and to offer recommendations for multi-level interventions.

The social-ecological model has been used in previous research to uncover factors influencing PA in later life. A study by Pan, Cameron, DesMeules, Morrisson, Craig, & Jiang (2009) measured correlates of PA among Canadians 15 to 79 years of age. A survey was developed according to the social-ecological model and captured individual (self-rated health, education, family income, intention, self-efficacy, perceived barrier/facilitator), social (social

support), and environmental (facility availability) correlates of PA among older Canadians. Likewise, A recent study by Schmidt, et al., (2016) explored beliefs about PA among older adults in rural Canada. Results from semi-structured interviews found social-ecological factors influencing PA. Emergent facilitators were: a) maintaining health b) social interactions, c) volunteering opportunities, and d) accessibility and safety. Emergent barriers were: a) age-related physical decline, b) concerned families, and c) fear of falling. Despite demonstrating the benefit of exploring PA in later-life from a multi-level perspective these studies have looked at broad multi-levels factors and have not captured the age-specific factors shaping behaviours (e.g., age stereotypes)

To our knowledge, only one other recent study has explored age-specific perceptions of barriers and facilitators influencing PA (Zimmerman, Carnahan, & Peacock, 2016). Results found individual age-specific PA motivators were relieving chronic pain and managing illness, improving mental health, and feeling more energetic. Individual age-specific barriers included lack of knowledge, physical and mental challenges, and maintenance of a PA routine. Interpersonal (social environment) factors included time constraints and competing priorities (particularly care taking roles), and a desire to stay healthy for their loved ones (grandchildren). Factors relating to the physical environment included the natural and built environment (e.g., parks and trails), affordability, availability, and accessibility). However, participants from this research were rural women residing in Southernmost Illinois aged 18 to 70 years of age or older and were for the most part inactive.

While these studies lend support to the validity of the social-ecological model for research exploring factors influencing PA in later life, they also point to some important gaps in

the literature. To date, very little research has explored *age-specific* factors of later life PA, and no research has done so in a population of active older adults. The present study will attempt to fill these gaps by exploring multi-level age-specific PA factors in a population of active older adults.

Research Gaps and Significance of Study

The current review of the literature outlined notable gaps that merit further investigation. Firstly, the perspective and experiences of active older adults in age stereotypes and PA research is missing. To date, research has explored age stereotypes from the perspective of randomly selected community-dwelling older adults (e.g., Meisner et al., 2013) or masters' athletes (e.g., Diogini, 2006). Although this research offers a range of perspectives from sedentary older adults to elite athletes (who are not necessarily 65+ years of age), there has not yet been a study focusing specifically on active agers. To bridge this gap, and offer a perspective from a group of older adults who currently engage in these wanted health-promoting behaviours, this research project will purposefully select active older adult participants.

Secondly, within this research area there are conflicting results regarding the effectiveness of positive age stereotypes, and of what constitutes realistic and positive age stereotypes (e.g., Diogini, 2015; Horton, et al., 2007; Horton, et al., 2008; Ory et al., 2003). To bridge this gap, and offer a balanced perspective, this research study will explore both negative and positive age stereotypes, through exploratory qualitative methods working from findings of past research.

Thirdly, from a methodological viewpoint the majority of research on age stereotypes and PA employ quantitative methods (i.e., experiments or surveys). Qualitative research is valuable

in this research area given the subjectivity and complexity of aging experiences. Additionally, this research aims to increase the current knowledge of age stereotype and PA not only pertaining to individual-level experiences, but also to explore ways in which age stereotype act as a barrier and/or facilitators of PA at individual, interpersonal, community/organizational and societal levels. This developed understanding will help fill in the existing gaps in the literature and it will help guide future research and health promotion interventions (e.g., healthy aging and/or PA programs and policies related to older adults) to support health and well being in later life.

Research Questions

Ultimately, this study will explore the following research questions pertaining to age stereotypes and PA among active older adults in the Halifax Regional Municipality:

a) What do they, active older adults, believe about the/their aging process (i.e., age stereotypes, both positive and negative)?
b) What age-specific factors (barriers/facilitators) do they encounter when adopting or maintaining PA? How have they overcome and/or managed these age-specific PA barriers? How have they benefitted from these age-specific PA facilitators?

Summary

The following chapter has presented and outlined the gaps in the literature on age stereotypes and PA in later life. The findings show that PA is paramount for numerous health outcomes. However many older adults are not reaching the required PA guidelines. A common misconception about aging is that of inevitable physical decline, false as they may be, these beliefs are harmful as they diminish the possibility of PA engagement in this population. Positive

age stereotypes have been less explored but seem to act a facilitator for PA. Therefore, health promoters should explore the influence of both positive and negative age stereotypes.

Previous research on age stereotypes has mainly used quantitative methodology and has been individually focused. Although these methods have confirmed the relationship between age stereotypes and PA they cannot capture the subjective and complex experience of aging. The available qualitative research has mainly focused on inactive community dwelling older adults or masters athlete; this group however is not representative of the aging population. Moreover accounts of community dwelling older adults have found images of masters athlete to be unrealistic, no research yet has explored this topic in active older adults. This research project will attempt to fill these gaps by a) using qualitative methods, b) exploring this problem from a multidimensional perspective, and c) offering a voice to active older adults. The following chapter will present this research projects' methodology and design.

CHAPTER 3: METHODS

The following chapter will outline the methods used for the present study. The following paragraphs will outline the study methodology, followed by an explanation of the study design and data type. After which, an explanation of the desired participants and recruitment strategy participants is given, as well as an explanation of the setting and procedures of this study is given. Following these explanations, the collection and management of data is described and the chosen analytic framework data is discussed. A brief paragraph is given on researcher detail and reflexivity, followed by an explanation of ethical considerations. Lastly, the dissemination strategy for results is described.

Study Methodology

As previously stated, the current research project followed an exploratory qualitative approach. The reason for this was twofold: a) The majority of age stereotype research is quantitatively-focused, which has resulted in a lack of complete understanding of this research area in terms of both breadth and depth (Diogini, 2015), and b) a qualitative approach is appropriate when exploring a topic that has not yet been fully explored (Marshall & Rossman, 1999). Moreover, previous qualitative research exploring PA in elite older adult athletes has found this method to be "sensitive to the ambiguity and subjectivity of the aging experience" (Diogini, 2006, p. 376). Thus, generating data through qualitative inquiry allows researchers, health promoters, community-based organizations, and other stakeholders to create holistic PA programming and policies that acknowledge psychosocial factors for PA in later life, as well as uncover new knowledge that will guide further research in this field.

To answer the research questions, fundamental qualitative description served as methodological framework. Qualitative description is an inductive research approach that offers "a comprehensive summary of an event in the everyday terms of those events" (Sandelowski, 2000, p. 336). The naturalistic principles of qualitative description are suitable for this study as it did not aim to create an interpretation of events but rather give a surface understanding of beliefs about aging and age-specific factors influencing later life PA (Neergaard, et al., 2009; Sandelowski, 2000). Additionally, the exploratory nature of this project is fitting for the pragmatic approach of qualitative description as it allows a "rich, straight description of an experience or event" (Neergaard, et al., 2009, p. 2). In order to give an accurate description of the experiences of participants' researcher reflexivity needed to be addressed. To increase the dependability of findings, thematic maps were reviewed with the supervisor at each step of the research process (Neergaard et al., 2009).

The social-ecological model was used as theoretical framework to capture the multi-faceted and interactive factors of later life PA. Exploring a broad range of factors that influence health is foundational to health promotion (PHAC, 2012), and therefore the use of models that capture such factors was appropriate for this research project. For the purpose of this research special attention was given to the individual-, interpersonal-, community/organizational-factors. The above-mentioned levels of this framework were used during data collection (creation of a semi-structured interview guide) and data analysis. No efforts were made to uncover societal level factors in the interview guide, however factors at this level were uncovered as they emerged naturally from conversation.

Study Design & Data Type

The naturalistic principles of qualitative description demand "person-to-person data collection with a human being" (Lincoln & Guba, 1989). As such, one-on-one interviews were conducted for data collection. For an exploratory study, interviews were appropriate as they offered the opportunity to answer broad research questions with ample detail and description (Creswell, 2007). Additionally, previous research shows this type of data collection method to be effective when gathering information pertaining to both matters of aging and PA (e.g., Diogini, 2006).

In accordance with qualitative description, a semi-structured interview guide (Appendix A) was created based on "expert knowledge to focus on the areas that are either poorly understood… or amenable to intervention" (Neergard et al., 2009, p. 2). The interview guide ensured that the primary research questions were answered systematically; but allowed for the use of off-script probing questions to facilitate a deeper exploration of discussion topics.

More specifically, semi-structured discussions were initiated using three broad guiding questions: *What do you think of aging? What do you think led you to be physical active? What about aging makes it easier/harder to be physically active?* Additional probing questions were used to explore the complexity of aging and its connection with PA (i.e., *Have you always believed this about aging - What led you to believe this? / How do others reacts when they see you engaging in PA?*)

Additionally, to offer practical recommendations for future coordinated action among health professionals, community organizations, and policy makers, the interview guide was created using the social-ecological model as a framework to explore the multi-faceted aspects of

age stereotypes and PA. Interview questions were developed to uncover individual-, interpersonal-, community/organizational- levels of this model. No questions were developed to uncover societal-level factors, rather the interviewer let these factors emerge naturally from conversation. Interviews lasted between 45 to 60 minutes per participant.

Throughout the interview process the researcher was aware of the age difference between herself and the participant. This was important, as previous research outlined the effect of intergenerational interactions in interview settings. Seeing as how interview data is co-constructed between the interviewer and the interviewee, special consideration was given to factors that may define or draw attention to this age gap (Grenier, 2007). For example, participants were free to choose the location and time of the interview, the interviewer was careful to use neutral language around aging to let participants interpret for themselves questions surrounding aging, and finally prior to beginning the audio recording the interviewer dedicated time to talk to the interviewee about topics unrelated to the research in an effort to build trust and rapport.

Participants and Recruitment

The inclusion criteria for the participants of this study (i.e., active older adults) were as follows; Participants were: a) at least 60 years of age or greater, b) regularly engaged in moderate- to high-intensity PA (150mins per week in bouts of 10 minutes or more, as described by CSEP guidelines), and c) currently residing in the Halifax Regional Municipality, and d) willing to participate in a 45- to 60-minute interview on the topic of age stereotypes and PA. 15 older individuals were purposefully selected as participants. This was found to be an appropriate

number of participants for meaningful themes and useful interpretations to emerge from the data (Mason, 2010).

Purposeful selection was facilitated through the use of a screening tool (Appendix B). The screening tool gathered demographic information on the participant such as age, gender, ethnicity, income, and level of education. These measures were included in light of previous research recognizing the gender- and ethnicity-based differences in experiences and perceptions of both aging and PA (e.g., O'Brien-Cousins, 2000; Sarkisian, Shunkwiler, Aguilar, & Moore, 2006; Smith, et al., 2012), as well as evidence that perceptions of aging impacts PA in adults of varying social economic status differently (Dogra, Al-Shabab, Manson, & Tamim, 2015). Levels of PA were assessed through yes/no questions regarding frequency, duration, and intensity. Only participants who fit the inclusion criteria were contacted to participate in the research study.

In accordance with qualitative description, this study employed both purposeful and snowball recruitment techniques to recruit active older adults. These appropriate strategies ensured "information-rich" participants who displayed the desired attributes of the research population (Green & Thorougood, 2014; Sandelowski, 2000), and who were interested in speaking and sharing their ideas on a research topic, were selected (Berg, 2007; Creswell, 2007).

As often found, purposeful recruitment for this study drew on researcher knowledge, expertise, and networks (Berg, 2007). The professional connections of the research team were used as a recruitment resource. During this study many recruitment strategies were used. Firstly the researcher met with an active member of Canada 55+ Games Society to discuss her involvement in the recruitment. She agreed to circulate the recruitment poster (Appendix C) via e-mail to her connections. Secondly, the researcher was invited to give a presentation, to older

adults enrolled in a biweekly CrossFit class, at a local CrossFit Box, regarding the objectives of the study and potential for participation. Recruitment handouts were given to those in attendance. Thirdly, a recruitment poster was circulated to other individuals known to the researcher who have connections to organizations that promote later life PA. Lastly, at the end of each interview participants were told that they could forward the information regarding this study to any other older adults who met inclusion criteria, and whom they may think would want to participate.

Participants contacted the primary research via phone and email. Once participants demonstrated an interest, an invitation for participation was sent via email (Appendix D) along with the screening tool (Appendix B). Potential participants were asked to complete the screening tool and return it to the researcher. If the potential participant met inclusion criteria, a date and location for interview were selected.

Setting & Procedure

Following Creswell (2007), to ensure the accuracy and privacy of the recording information, one-on-one interviews were held in a quiet and private location to facilitate uninterrupted and effective audio recording for data collection purposes. Where face-to-face interviews were not possible, for reasons such as geographical location and scheduling, data was be collected from one-on-one, over-the-phone interviews. Both the researcher and participant selected their own quiet and private locations for this phone interview. Locations were determined before the date and time of the interview, participants were briefed to find a comfortable and quiet location free of distraction for the full duration of the interview. On the day of the interview, the primary researcher briefed each participant with the purpose of the study and walked him or her through the informed consent form (Appendix E). Verbal consent

was obtained and recorded before beginning the interview (Appendix F). Participants were explicitly reminded that all information collected throughout the interview process will remain confidential, and all identifiers will be removed from the transcripts to maintain confidentiality.

Data Collection and Management

As noted above, the interviews were audio recorded to provide the verbal data, which was transcribed verbatim to provide textual data. Thus, special care was given to audio recording arrangements, such as the use of a backup audio recording device. To facilitate audio recording for over-the-phone interviews, participants were placed on speakerphone. It is important to note some disadvantages of phone interviews such as phone expenses, and the researcher was not able to note non-verbal communication (Creswell, 2007).

A password-protected computer on a secure network was be used to store, manage, and analyze all audio-recorded and resulting transcript data. Following transcription the audio-recorded files will be protected on an encrypted hard drive that will be stored on Dalhousie University property, no paper copies were made of transcripts. Data will be retained for five years after the conclusion of the study. After this time, all digital files will be wiped from the hard drive.

Data Analysis

As advised by Creswell (2014), data collection, data management, data analysis, and preliminary reporting of findings occurred simultaneously. Rigorous data analysis commenced soon after the first interview was transcribed, and continued until all 15 interviews were completed.

Thematic analysis was the chosen analytical approach for this research project. Thematic analysis is a "method for identifying, analysing, and reporting patterns (themes) within data" (Braun & Clarke, 2006, p.6). Using thematic analysis within the scope of a master's thesis was useful to the student as she gained "core skills that will be useful for conducting many other forms of qualitative analysis" (Braun & Clark, 2006, p.4). It was also well suited within the framework of qualitative description as they are both inductive approaches used to derive themes from data (Braun & Clarke, 2006; Sandelowski, 2000). In the context of an exploratory study thematic analysis allowed for rich description of the data set to highlight and give the reader a sense of the important themes. This systematic, yet dynamic, set of guidelines directed data analysis through a six-stage coding process (Braun & Clarke, 2006):

Phase 1 involved becoming familiar with these data. To do so, the researcher listened thoroughly to all interview audio recordings twice before any of the data were transcribed. The researcher then transcribed and de-identified all the data using the qualitative analysis software NVivo11.4.0. The act of transcribing allowed the researcher to familiarize herself further with the data. Phase 2 entailed generating initial codes. Given the exploratory nature of this study themes were data-driven. While generating codes the researcher worked in a systematic manner giving "full and equal attention to each data item" (Braun and Clark, p. 18). Taking advice from Braun and Clarke (2006), this initial coding process generated as many codes as possible. Once data was initially coded, Phase 3 begun. This phase aimed to place the codes within a broader context to determine how they interact with each other. Codes were organized and combined into themes and subthemes. The primary researcher developed a preliminary thematic map to facilitate this process. Thematic maps are a kind of "mind map" that offer a visual representation

of the hierarchical relationships among themes and subthemes (Braun & Clark, 2006, p. 89). Before moving forward with Phase 4, this map was thoroughly reviewed with the research supervisor to increase data analysis and result trustworthiness (Shenton, 2004).

In Phase 4, themes found in the initial map were reviewed to determine and finalize patterns, and each theme was investigated individually and contextualized within the rest of the collected data. Once all themes are reviewed, and the researcher was certain no important themes were missed, a new developed final thematic map was created. Once again, this map underwent the scrutiny of the research supervisor. Final thematic maps have been included in the result section on this work (p. 42, p. 49). Phase 5 entailed defining and naming the themes found in the developed thematic map, which was also be reviewed and refined with the research supervisor to ensure the given names captured the "essence" of the themes' meaning. This report is Phase 6 of the project. Not only is this project written in fulfillment of the lead researchers Masters of Arts in Health Promotion thesis, but reports for academic and public dissemination will also be produced. A further discussion of dissemination plans is found further in this chapter.

Researcher Details & Reflexivity

The lead researcher is a current MA student of the Health Promotion program in the School of Human and Health Performance at Dalhousie University in Halifax, Nova Scotia. She was involved in all stages of the research process. The primary researcher has completed a MA level advanced research methods course, which has given her the necessary foundation to conduct research. The primary researcher has also completed the Tri-Council Policy Statement 2: Course on Research Ethics (TCPS 2: CORE), which has given her knowledge of the ethical considerations for her research project.

As mentioned in a previous section, given that the primary researcher is not a member of the population of interest (i.e., older adults), greater attention was paid to the potential influence that age difference may have on the interpretation of results to minimize bias. The researcher acknowledges that her perceptions and beliefs about aging are built from observing processes of aging in others and knowledge found in academic journals. She also acknowledges that aging is not a homogenous experience and gave careful consideration to capture the unique and diverse perspectives of aging brought forth by participants. Doing so ensured that her perceptions of the aging process were not imposed on these data or results.

Ethical Considerations

It is important to consider ethics because of the importance of research for our communities and society as a whole. In order to continue research with human participants following ethical guidelines ensures the possibility of continuing research in the future (Tri Council, 2010). As such, following regulations from Dalhousie University, this data collection did not begin until after the research team received official approval from the Health Science Research Ethics Board. The following paragraphs outline the informed consent process, the care given to the privacy and confidentiality of participants, the risk and discomforts as well as the benefits of participation.

Informed consent. Informed consent documents (Appendix D) were included in the initial email correspondence between potential participants and the lead researcher. This ensured participants had the opportunity to review and prepare any questions they may have about the project and/or their participation to address before beginning one-on-one interviews (if consent is provided). Moreover, during the first conversation with participants (either over-the-phone or in-

person), the lead researcher explained the details of the study and the informed consent form (Appendix D). A short period was dedicated to answer any questions from participants. Once there was mutual understanding of the project's goals and objectives, oral consent was taken and recorded (Appendix E). All participants consented to participate in this study, ongoing assent continued throughout the interviews indicated by the completion of questions outlined on the interview guide.

Privacy and confidentiality. One-on-one, especially in-person interviews, do not allow participants to remain anonymous to the researcher. However, all interactions and data provided was anonymized (i.e., de-identified) and kept strictly private and confidential. To maintain the privacy and confidentiality of the participants' information, only the research team (lead researcher, her supervisor and committee members) had access to these data. All identifying information, including participants' names, personal information, as well as proper names of people, were excluded when transcribing the audio recordings. A password-protected computer on a secure network was used to store, manage, and analyze all audio-recorded and resulting transcript data. After the audio recordings were transcribed, the audio-recorded files were protected on an encrypted hard drive that will be stored on Dalhousie University property. Data will be retained for three years after the conclusion of the study. After this time, all digital files will be wiped from the hard drive.

Results and direct quotations used in dissemination are unattributed. Identification numbers indirectly identify participants (e.g., P1) in the final report. Permission to use direct, unattributed quotations was asked and obtained by all participants. No quotations with personal or occupational identifying information or other details that may reveal the participant's identity

were used. This study followed a strict adherence to the principles of maintaining confidentiality as outlined in Article 5.1 of the TCPS 2 (Tri Council Policy, 2014).

Potential risk and discomforts. Older adults are sometimes considered a vulnerable population (Tri Council Policy Statement, 2014); however, this research selected older adults who are engaged PA and display positive traits of aging. Consequently, it was less likely that participants required additional accommodations (e.g., mobility and transportation support). Otherwise, some potential risks of participating in this study included becoming fatigued during the 45-60 minute interview. Another potential risk was feeling uncomfortable while discussing the topic of aging, especially with a researcher who is younger in age. As such, the researcher was mindful and sensitive throughout the interview to this potential issue. To mitigate these aforementioned risks, the researcher progressed at the speed of the participant. Also, as part of the informed consent process, the researcher noted that participants could skip any question, take a break, or withdraw from the study completely at any time. However, no participant asked for these accommodations during the interview. These risks were classified as 'minimal' as the "probability and magnitude of possible harms implied by participation the research is no greater than those encountered in day-to-day life" (Tri Council Policy Statement, 2014, p. 23).

As noted on the informed consent form, and reiterated in the oral consent process if participants wanted to leave the study they were able to withdraw at any time. Participants were informed that if they withdrew from the research project during the interview, all data collected up to that point would be deleted. The informed consent form also informed participants that even after the interview is completed, they had one week to determine if they would like their data removed from the study. After this one- week period, it became impossible to remove data

as it was de-identified and data analysis had begun. No participants contacted the researcher to remove any data.

Benefits of participation. Although there were no direct benefits, participants of this research study were chosen because of their personal interest and experiences with the subject matter. Therefore, this research study may have indirectly benefitted participants through engaging with a research topic that directly pertains to their interests and personal experiences. Participating in this study may also have generated a sense of having contributed to research and the promotion of PA for older adults in Nova Scotia. Moreover, given that aging is often presented in our socio-cultural context in a negative light (e.g., inevitable decline), discussing PA achievements may have provided a positive and rewarding experience for the participant.

Dissemination Strategy

The primary report of this research project is written in partial fulfillment of the lead researchers Masters of Arts in Health Promotion. Once completed and successfully defended, this work will also be prepared for presentation at academic conferences (e.g., Annual Scientific Meeting of the Canadian Association on Gerontology in 2017), and for publication in scholarly peer-reviewed journals (e.g., Journal of Aging and Physical Activity). In addition to these traditional academic dissemination platforms, a brief report will be draft and sent to the two partnering organizations. Moreover, participants were asked at the time of the interview whether they would like to receive a document outlining the main findings from this study, those who answered yes will be emailed with this information. Questions and discussions of future directions will be welcomed and encouraged.

Summary

This chapter outlined the research methodology and methods of this project. A qualitative approach was used for exploration. Qualitative description served as a methodology to answer the primary research questions. This inductive approach proved to be well suited for an exploratory project as it aimed to present the data without researcher interpretation staying as close to the original data as possible.

Data was gathered from semi-structured, face-to-face or over-the-phone interviews, all interviews were audio recorded. Participants were purposefully recruited according to their experience with the research topic. Data analysis commenced shortly following the first interview. Thematic analysis served as an analytical approach following the six steps outlined in Braun and Clark (2006).

Following careful ethical consideration this study was considered minimal risk by the Dalhousie research ethics board (REB#2016-3639). The researcher obtained informed consent from each participant before data collection commenced. Despite some potential risk and discomforts the benefits of participation proved more substantial.

CHAPTER 4: RESULTS

The upcoming chapter presents the results of this study. To begin participant demographics are given. This chapter is separated into two sections, each answering one of the research questions. In first section of this chapter the results of the first research question – *What do they, active older adults, believe about the/their aging process?* – are given. In the second section of this chapter the results of the second research question – *What age-specific factors (barriers/facilitators) do they encounter when adopting or maintaining PA? How have they overcome and/or managed these age-specific PA barriers? How have they benefitted from these age-specific PA facilitators?* – are given. Direct quotations from participants are provided to support each theme and sub-theme.

Participants

A total of 15 active older adults participated in the study, five identifying as male (33%), 10 identifying as female (66%). Participants ranged from 60 to 74 years of age. All were residents of the Halifax Regional Municipality and lived within an eight-kilometre radius of the city of Halifax. Only one participant identified as part of visible minority group (Acadian). Yearly household income ranged from 20 000 – 39 999$ to 80 000 – 100 000$, median yearly household income was 60 000 to 79 999$. Education level ranged from trades school training certification to University graduate degree, all participants reported having obtained at least a high-school diploma. All participants reported engaging in at least 150 minutes of moderate-to vigorous- PA in bouts of 10 minutes or more. Accounts from participants revealed they engaged in a variety of PA such as running, cycling, swimming, participating in group exercise classes

and team sports, as well as other various physical activities to a lesser degree (e.g. kayaking, snowshoeing, cross-country skiing, downhill skiing, dancing, yoga, climbing).

Section 1: Aging Beliefs Among Active Older Adults

Data pertaining to the first research question, *what do active older adults believe about aging?,* were coded systematically across the whole data set, all codes relevant to the first research question were gathered and organized into two over-arching themes. A final thematic map, *figure 1*, was created demonstrating a hierarchical relationship between themes and sub-themes. The first theme, "societal beliefs about aging", explains what participants believe about the aging process in general. Within this theme, two sub-themes emerged: a) old and ill – young and healthy, and b) aging beliefs shaping behaviour.

The second theme, "personal beliefs about aging", explains what active older adults believe about their own aging process. Within this theme, two sub-themes emerged: a) controlling aging, and b) rejecting negative age stereotypes. The following paragraphs illustrate how findings from this study relate to the current literature on aging beliefs, and outline the new and novel contributions to this field.

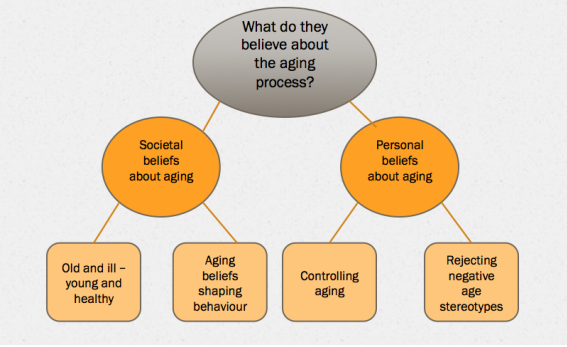

Figure 1. Developed thematic map, showing themes and sub-themes of the research question.

Societal Beliefs about Aging

Aging can be understood as both an experience and a construct. This is shown by the responses of participants when asked to discuss thoughts about aging. As one participant said, "We get classified by our peer group, and by society really, as by our age. Those people of certain ages have to act this way". The first theme captures beliefs relevant to common societal age stereotypes. These beliefs may or may not apply to participant's personal aging experience; rather they reflect current societal understandings of the aging process. Two emergent sub-themes capture theses common societal beliefs about aging: a) old and ill – young and healthy, and b) aging beliefs shaping behaviour.

Old and ill – Young and healthy. The first sub-theme that emerged from participant's responses was a belief that aging was a primarily physiological and pathological process. For example, when asked to discuss aspects of aging, P6 responded: "Health concerns I guess, I worry about that, I don't want to have to develop anything I don't have to". Many participants shared P6's fear of developing unwanted age-related health conditions. In fact, illness in old age was so dreaded that participants disclosed they would "rather just not be here" (P8) than to be old and sick. This is captured in the following quote by P2 who shared, "My health is good but I figure when that goes I'll be finished. I won't want to be here". These accounts reveal aging is bounded by sickness and physical decline.

These statements, however, also reveal that participants are, for the most part, currently benefitting from good health. Perhaps for this reason, they reported, "not feeling old" (P8). For example, P1 stated, "chronologically we're getting older, but if you start to feel it you are it". These statements suggest that participants attribute being "old" to a feeling, not a number.

Overall, these quotes indicate that “feeling young” is feeling healthy whereas “feeling old” is experiencing illness and/or physiological decline.

Aging beliefs shaping behaviour. Responses found in this second sub-theme describe how aging beliefs can guide behaviours of aging adults. Common stereotypes of aging appeared to dictate the ‘age appropriateness’ of activities for older adults. For example, P3 shared:

> It’s really easy to give into, “Well this is what's supposed to happen, you know, I'm supposed to slow down, I'm supposed to sit on the couch, I'm supposed to be reading the newspaper, I'm supposed to be lawn bowling” or whatever it is.

Participants believed these stereotypes led other aging adults to use ‘being too old’ as an excuse to disengage in PA. For example, P5 said, “I don't think people should look at age as a barrier - just try things”. Interestingly, these statements not only demonstrate common stereotypes of aging, but also show participants do not endorse this stereotype. In fact, they actively reject this “misconception” of aging:

> I think people believe things like when they get a certain age they can't do stuff. There's this kind of misconception that, you know, just because you’re this age: "Oh I can't do that anymore, so much for me," that kind of thing. Whereas I don't have any misconceptions about that, I just think you should try. (P5)

Participants also shared stories where they openly challenged age stereotypes and experiences of ageism within a PA context that generalized physical/functional decline as an inevitable part of the normal aging process. In the following statement P10 described an interaction with her step class instructor, she said, “I'm the only one in class that has two risers, and the instructor is saying, “You know, don't you think it's time now that you went down to one?" I said, "No, I don't

think so". Similarly, P1 discussed a scenario where she anticipated having to assert her abilities as an active older adult. While discussing an upcoming move to the West Coast and visiting new CrossFit gyms she said: "They're [employees of the CrossFit gym] going to go: "No granny, we don't have any classes for you". I'm going to go: "Hey, I've got news for you buddy". This last example also demonstrates participants may be reacting to what they expect to experience as an aging adult (e.g., occurrence of ageism) as well as direct experiences.

Personal Beliefs About Aging

Findings from this study demonstrate a clear distinction between popular societal beliefs about aging and what are active older adults personal beliefs about aging. The second theme captures participants' beliefs about their aging process. These pertain directly to how participants themselves understand and experience their individual aging process. Two sub-themes emerged at this level: a) controlling aging, and b) unlearning age stereotypes

Controlling aging. A first distinctive subtheme that emerged from the data was the perceived ability to control unwanted signs of aging through PA. Physical activity was believed to prevent, or delay the onset of unwanted age-related health declines and health conditions described above. For example, while discussing factors influencing his running P4 stated:

> The one thing that really struck me as I'm getting older, and I'm noticing people getting various diseases around me, is that whenever you read about how to prevent almost any problem physically or mentally it's exercise and diet, right? Exercise and diet, it's the same thing for almost every problem. So, I figure, okay well...

Similarly, when asked why he runs P11 answered, "I believe there is fairly firm information that you slow down cognitive delay by running, and actually that's probably... that's a big answer to

your question, that's why I run really". As stated above, like other participants P11 believes in aging health declines, however this statement demonstrates he also believes PA (running) will "slow down" this process.

Some participants, however, had conflicting beliefs about the extent to which PA could control aging. For example, P5 shared: "I think it really is huge for older people to keep moving, that's how you keep them out of the hospital". However, she also stated: "I'm lucky enough so far, touch wood, not to have any problems like that and I hope I don't". In these examples, P5 demonstrates both beliefs that she can control aspects of aging, while also indicating aging well is a matter of luck. The following accounts from P10 also demonstrate this conflict, she stated: "I don't want to be like my mother, so I'm actually doing it to stay healthy and fit". She later stated: "I don't want it to happen to me but I suppose a lot of time you don't have any control over it". These conflicting beliefs demonstrate beliefs regarding aging and control are not always clear and distinct; rather they are complex and changing. Participants' beliefs regarding inevitable aging declines oscillated between beliefs of inevitable decline and control.

Rejecting negative age stereotypes. In spite of the presence of negative-age stereotypes that generalize physical/functional decline as an inevitable part of the normal aging process, a barrier outlined in the previous section, accounts suggest participant's beliefs about aging are modifiable. It appears that through critical reflection and engagement in PA participants reject common societal beliefs about aging and form their own individual beliefs about this process. For example, when describing what she does to stay active, P2 spoke of her hiking club and a recent trip to Gros Morne, she said:

> I had done Gros Morne and I thought it was hard the first time. We went back five years later and I found it much easier. Actually, I did it twice in one week, here I am five years older, and so that proved to me - age has nothing to do with it.

The sentence “that proved to me - age has nothing to do with it” suggests P2 previously believed chronological age was a good predictor of physical abilities; however, she noted her physical abilities actually increased over time. This is significant, as it suggests that engagement in PA may initiate a critical reflection process, which causes older adults to rethink chronological age as a factor for PA. This same critical reflection can be seen in the following example by P10:

> When we go on these long bike trips, people think that it's, kind of like, not normal at our age, but it doesn't hurt us. So we just keep on doing it, and feeling good about it.

This demonstrates P10 critically reflecting on her PA levels as an aging person. Although she acknowledges that her level of cycling is not perceived as “normal” at her age, her personal experience discredits the validity of this stereotype.

One participant also indicated that, following a brief interruption of her PA routine, critical reflection was crucial for her get her “fitness level back up there”, she said:

> I kind of fell off the wagon a little bit, then when you try to get back on it, it's really hard, so I started to think: "Oh it's because of my age", and then I'm thinking: "No it's not. It's because you've not been doing it for a while" (P5).

Overall these examples demonstrate that active older adults use their PA accomplishments to critically reflect upon harmful age stereotypes. When participants recognizes their PA

accomplishments they reject negative stereotypes of aging that would otherwise diminish the possibilities of PA in later-life.

Section 2: Social-Ecological Analysis of Age-Specific Factors to PA

Using the social ecological model this study captured some multi-level age-specific factors that contribute to participants' PA engagement. Barriers and facilitators were identified at the individual-, interpersonal-, community/organizational-, and sociocultural-levels of this model. Importantly, not all factors were solely facilitators or barriers rather some factors were mixed and operated as both a facilitator and a barrier depending on the individual and/or the context. The following analysis is presented using a bottom-up approach working from individual-level factors to higher-level societal factors. This approach was taken to first represent how individual behaviour is contingent on higher-level factors. Thematic maps have been developed at each level of the social ecological model, *Figure 2* illustrates the final thematic map of the multi-level factors for later life PA.

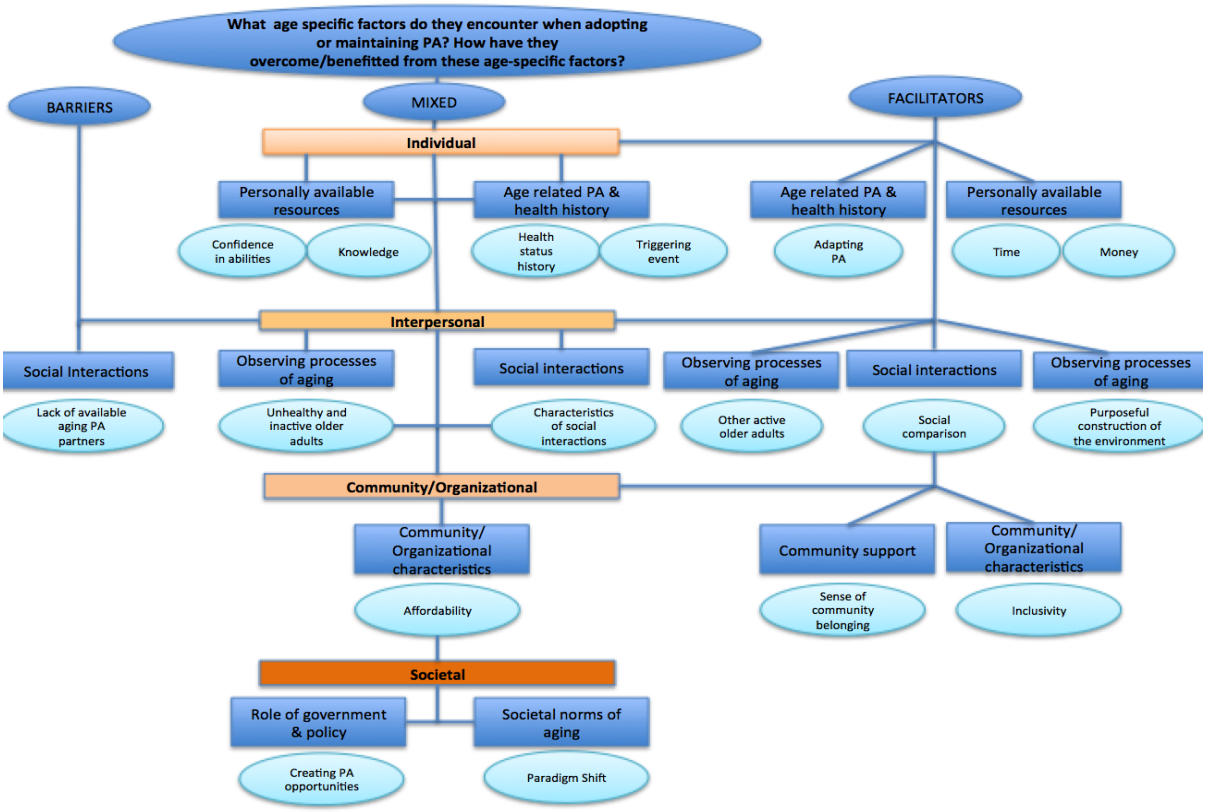

Figure 2. Developed thematic map of research question two illustrating the social-ecological age-specific factors influencing later life PA.

Individual Level

Individual level factors reflect behaviours and characteristics of the participants themselves. While they are influenced by higher-level factors, individual factors occur exclusively within the individual. Factors at this level have been categorized into two over-arching themes, these are: a) personally available resources (that commonly change with aging), and b) age-related PA and health history. The following paragraphs outline these themes as discussed by participants.

Personally available resources. The first over-arching theme captures experiences of participants benefiting from, and/or being hindered by, the availability of certain resources. Four resources emerged from the data: a) time, b) money, c) knowledge of PA and health in later life, and d) confidence in physical abilities as an aging adult. Importantly these resources have all been gained or lost from aging-related processes or events.

Time. Following retirement, participants benefitted by having "more free time" (P6) to dedicate to PA. For example, P2 shared, "I think I do more physically now. I mean, you know, I was raising a family and working outside the home. You really don't have time for these activities, but I have time now". Although some participants discussed gained time for leisure or sport, this was not the experience of all participants. In fact, some participants were hindered by a lack of time. Despite reduced work hours, some participants still felt "too busy" (P8). For example, P10 stated, "The older we get, everybody seems so busy. I thought we shouldn't be so busy now, you know, we don't have the kids, we're not working, I don't understand why we're so busy". This quote indicates that although P10 expected gaining time in retirement, in reality she did not. Another unique, but notable, finding was the following statement by P11:

> It takes up a lot of time and I worry about that in the context of now having a defined limit to the amount of time I have left. I worry about the amount of time that is going to be spent running. I might stop or reduce that after my 70th.

For P11, acknowledging mortality prompted him to reprioritize, and reduce, the amount of time spent in PA. Overall, some active older adults benefitted from additional time gained in older adulthood while others struggled to find time for PA.

Money. A second emergent sub-theme is being financially able to participate in PA opportunities. Similar to time, availability of disposable income changed for some participants following retirement. One participant, P6, explained she was cautious with the amount of money spent on these activities because of retirement. She said, "I just feel being retired I don't want to spend. I'd like to keep my spending on PA down, you know, I don't mind spending some but". Another participant shared just how important financial planning was to his retirement, that it had allowed him and his wife to "pursue the things" (P3) that are important to them, in this case running. He followed this statement with, "It's kind of like the health side, one of the best things you can do is plan for your healthy retirement as much as your financial retirement" (P3). These accounts indicate that despite reporting above average annual household incomes participants are still hindered by the cost of certain activities. Participants found creative ways to address these income challenges such as sharing the cost of membership or activities.

Knowledge of PA and health in later life. The third individual resource was knowledge of PA and health in later life. Active older adults benefit from a specific understanding of the health promoting benefits of PA in later life, and of the benefits of moderate- to vigorous- PA. For example, when asked why he engaged in PA, P12 answered, "The benefits of physical fitness have been proven", he also noted "aging is probably greatly delayed by vigorous PA". Likewise, P11 said he ran because, "Running prevents quite a lot of the mental deterioration that is associated with aging".

The majority of participants also indicated that they acquired this knowledge through formal education. For example, P13 stated, "My background is in social work and in nursing,

you know, you kind of put the pieces together in reality and you say well, you know, how do I make that, how do I internalize these lessons?"

Similarly, P12, also a retired nurse, stated, "I think it came from nursing just seeing people who are physically able, you know physically fit and able to fight disease". However, not all participants relied on formal education, some participants gained knowledge through experience. For example, P8 noted:

> My knees creak when I go down the stairs and I get pain in my hips, I get all this weird stuff right? I just have to do it to feel better, and I feel better when I do it.

Overall, these examples demonstrate that specific knowledge of the health benefits of PA is a facilitator for PA in later-life.

Confidence in physical abilities as an aging adult. Not only did participants have knowledge of the benefits of PA, they also believed in their abilities as aging adults to engage in exercise. For example a big motivator for P3 was "coming to the realization" that he was an athlete, he said: "I'm an aging athlete but I am an athlete". Identifying as an aging athlete increased P3's confidence in his physical abilities. Participants also demonstrated this confidence through a willingness to try activities that may not be seen as 'age appropriate.' For example, P12 said:

> I hear: "oh poor me I'm getting old", or "I can't lose weight because I'm old", or "I can't go for a long walk because I'm old", or "No, I can't get back on my bicycle I'm too old", like no, you can try all those things. Until you try it, how do you know?

In this last quote P12 distinguishes his confidence to those of other aging adults and again speaks to the concept of resistance mentioned in research question one. This was also expressed by P1

who noted that although other aging adults knew the benefits of PA, “They’re just not believing they can do it”. This quote by P1 captures the idea that, unlike her, others do not believe in their physical abilities as an aging adult.

Age-related PA and health history. The second individual over-arching theme outlines individual differences in active older adults PA and health histories. Individual histories are important factors shaping later-life behaviours. The following chapters present participants’ health status histories, followed by accounts of active older adults adapting to age-related physiological changes. Finally a discussion of triggering events that shaped PA.

Health status history. In this sub-theme participants discussed their current health status and recent health changes. Age-related physical decline or age-related health conditions both helped and hindered PA. As aforementioned, in general, participants reported benefitting from overall good health. At the age of 68 years, P8 noted she took “absolutely no medications” and she was “pleased with that”. Likewise, P6 shared, “I’m grateful that I have no health issues at this age myself”. However, P6 also recognized that “everybody ages” and with this comes a realistic amount of physical decline.

Physical decline and/or age-related health conditions, at times, posed a challenge and impeded or “slowed down” (P14) activities for some participants. For example, when asked why he stopped running marathons, P9 explained, “Of course as I age, you know, you've got to slow down a little bit more and a little bit more as you age”. Other participants noted the challenges associated with age-related conditions. For example, P4 said:

> Physical exercise is just so much harder for one thing. All the things that change like, you know, memory loss. It makes it harder for me to keep track of exercise routines.

> I'm developing arthritis so that really interferes with some things, but I'm determined to stay as healthy as I can for as long as I can.

However, despite their challenges, noticing changes in health motivated participants to adopt or maintain PA as a way to counter the physiological effects of aging. For example, P4 was "… determined to stay as healthy as I can for as long as I can", he continued running despite finding it harder and joined an exercise class to complement his running.

Adapting PA to meet changing physical abilities over time. Despite aging-related physiological changes participants were able to adapt PA in order to continue to engage in this health promoting behaviour. For the majority of participants the health benefits gained from PA were more important than engaging in a specific exercise or sport. For example P3 said, "Whatever walk, or walk run, or walk and, it will still lead you down the path to a healthier future". This can also be seen in the following statement by P9:

> We took up snowshoeing too. We only got out once but this year we'll get out more. I look at snowshoeing as something well if I can't run then I'll snowshoe. When I can't do that I'll get into a wheelchair and push, that type of thing.

This example highlights P9's willingness and ability to find alternatives to his current PA. Overall, instead of disengaging in PA when active older adults are challenged by physiological changes attributed to aging they adapt, and/or find new, activities that meet any future changes in their physical abilities in order to keep "fit, healthy, and able" (P8). For example, P4 recently moved to Halifax, and found it difficult to adjust his running routine to the changing Nova Scotia weather. To make up for this, he joined a biweekly CrossFit class. Similarly, P9 stopped running marathons after a blocked artery, him and his wife now run triathlons – their focus has also

shifted from being more competitive to “not racing against anybody else, we’re racing against ourselves” (P9).

Later life PA adoption vs. lifelong PA. The PA histories of participants varied greatly, while some participants’ accounted their current behaviours to a lifelong history of PA, others spoke of a triggering event that caused them to reevaluate their health behaviours in order to positively influence their aging process.

Of those participants who recalled always being active, P1 shared: “I was always, like baseball, skating as a kid, you know, we were out in the country and so all those things I think helped me to be where I am now”. P13 also noted: “I've loved it forever, I've always liked it. I started with biking, I did do a lot of swimming when I was young and biking”. Based on these accounts it is apparent that despite their differences PA histories facilitated the adoption, or maintenance, of present day PA.

Of those who were ‘triggered’ into PA, P11 shared he adopted PA because of high stressors and negative relationships in his workplace, he said, “I felt that I worked very hard, I was under appreciated, and maybe I should do something that would allow me to gain some kind of personal achievement that couldn't be contaminated or invaded by those people”. Another participant recalled being quite unhealthy when he was younger until a series of unfortunate events resulted in him being admitted to the hospital.

> In my 30s, I smoked, drank too much, didn't eat well. I actually slipped a disc and I couldn't walk for three months. I was in the hospital for a couple of weeks. I think all of those things took their toll and I said I better shape up here. (P3)

Moreover, P9 told the story of the moment he chose to turn towards a healthier lifestyle, “I went through my divorce, I went with the partiers and the drinkers, and stuff like that. Then all of a sudden I said, "No, no, no”. I just woke up one day “I don't like feeling like this”. Importantly, these accounts illustrate that not all participants have a history of lifelong PA. Rather, some benefited from an aversive or meaningful event in time, related to ‘aging’, that caused the adoption of, or increase in, PA. Interestingly, motivational forces for PA of those participants who have history of lifelong PA appear to be intrinsic (e.g., enjoyment), while those who were ‘triggered’ appear to be extrinsic (e.g., later-life health as a reward).

Interpersonal Level

Interpersonal level factors are those that capture the influence of others (e.g., family, friends, social networks) on individual behaviours. Data show that these interpersonal interactions impact the PA of active older adults. At this level, three over-arching themes emerged, these are: a) observing processes of aging in others, b) social interactions, and c) purposeful construction of the social environment.

Observing processes of aging. During interviews participants often discussed observing the physical health, and health behaviours, of other aging adults. Observing other active older adults engaging in PA confirmed participant’s behaviours, and facilitated PA by reinforcement. Interestingly, observing sick and/or inactive older adults also facilitated PA by presenting participants with unwanted exemplars of aging (i.e., “stereotypical” older adults). When faced with these exemplars, PA surfaced as a method by which participants could exert control over the ‘aging’ process.

Other active older adults. Some participants shared stories of seeing elite older athletes and older adults engaging in leisurely or moderate- to vigorous-PA. For example, P4 shared: "I do see people that are older than me doing marathons and so on. That's inspiring". P2 spoke of members of two older members of her hiking club:

> They can both out walk any of us. They climb mountains and [Name of Hiking Group Member] for instance he'll walk the mountain in Mount Washington he'll double back down to see if everybody is okay and then he'll hop back up and he's 82 so whoa.

Seeing others engage in PA reinforced participant's beliefs in the health promoting powers of PA. For example, P14 said, "It's good to see older people continuing to be active because presumably that bodes well for me. I'll be able to do that too when I'm that age". Based on this data, exposure to active agers in participants' social environments clearly strengthens beliefs in PA as a health promoting behaviour and, in turn, facilitates PA.

Unhealthy and inactive older adults. Interestingly, observing other aging adults who are unhealthy and inactive also supported PA. Whereas seeing active older adults reinforced behaviour by demonstrating the health benefits gained from exercise, observing inactive and/or unhealthy older adults reinforced behaviour by demonstrating the potential outcomes of *not* engaging in PA or other health promotion behaviours. This finding can be observed in the following statement by P4, "I have a really good friend who's really not healthy—diabetes, overweight. I find that sort of reinforcing in the opposite way. I don't want to let myself get like that". Overall, participants turned to PA as a way to overcome negative age stereotypes. Despite

being healthy, observing inactive older adults posed a threat to participants' health by showing unwanted trajectories of aging, which in turn facilitated PA.

Social interactions. Not only are active older adults influenced by observing processes of aging in other aging adults, data also indicates factors specific to social interactions. Active older adults are supported or hindered by their social interactions with other aging adults. In the following paragraphs participants discuss how characteristics of social relationships, social comparison, and the availability of aging PA partners impact PA.

Characteristics of social relationships with aging adults. Data suggests that PA was supported when active older adults were interacting with other physically active older adults, and with other older adults who had positive perceptions about aging. Conversely, PA was hindered when active older adults were in social interactions with inactive older adults who had negative perceptions about aging. Having made this distinction, participants actively chose to surround themselves with individuals who displayed these traits. When discussing the importance of being surrounded with other active adults, P2 shared accounts from a recent visit with friends who are not particularly active, she said, "I just noticed how I had to gear down. It wasn't bad for the week, you know, not to exercise at all but it's not my style". For this reason, some participants had strong feelings regarding who they surrounded themselves with. For example P3 shared:

> Perhaps I'm almost a bit of a snob some ways in my social group... I have no interest in socializing with people that I know have terrible lifestyles, they're very unhealthy. I don't want to be around people like that if I don't have to.

Many other participants felt the same and spoke of the importance of these relationships for PA maintenance. These examples illustrate the importance of positive and active relationships on the PA of active older adults.

Social Comparison. Social interactions also allowed participants to compare their physical abilities to those of others. Social comparisons at times served to demonstrate realistic expectations of PA in later life. For example, in the following statement P4 shared his experience joining a bi-weekly CrossFit class. He said:

> Honestly, I was feeling quite discouraged because things are that much harder so I was comparing myself to how things were 10 years ago, 15 years ago, thinking – all of this is not good, I'm not doing as well. At the gym class I got so much support that I realized "Okay, for my age I'm doing okay". That really helps.

Other times, participants engaged in downward social comparison. Seeing others who are less proficient was motivating. For example P3 shared:

> I'm running with people that are in some cases half my age or less and I'm running with them, or I'm running better than them, I've got more endurance than they do. I found that very motivating.

Overall, responses indicate that social comparison facilitates participants' PA by creating realistic expectations of PA in later life and by reaffirming physical abilities through downward social comparison.

Lack of available aging PA partners. Lastly, PA was hindered by the difficulty of finding PA partners of the same age demographic. Active older adults were often in the presence of other younger athletes, however creating friendships with younger athletes was at times

difficult because, as one participant said: “People naturally segregate into their age groups” (P14). Another participant, P10, shared this feeling:

> A lot of my friends now are not as active as what my husband and I are, and I said to him: "We need new friends”. You know, because that's what we do. We do exercise, and, you know, our friends are just not. It's important that I have people around me that do the things that I like to do. So yeah, I need new friends. The trouble is they normally need to be younger and those people are still working, so.

This example not only captures the lack of available partners but also a change in the PA levels of previous partners. P14 echoed this sentiment when he noted:

> When I was doing triathlons in my 30s and 40s there was a different group of people that I was doing them with. Now that I'm in my 60s those people that were doing them when I was in my 30s, 40s, and 50s for whatever reason are not doing them anymore, so there's a whole different crowd of people. If I go to a Triathlon I'll know some people but the majority of them I won't know it's a younger crowd, so there's less motivation on my part to go because there's less of my friends that I will know there.

Overall, despite being able to interact with younger active folks, active older adults are hindered by the lack of available aging physically active partners.

Purposeful construction of social environments to support PA participation. A third sub-theme of this level is the purposeful construction of social environments as a means to avoid/remove potential barriers, and to benefit from known supports. For example, P14 disclosed

purposefully attending social gatherings because of the opportunities to engage in positive social interactions:

> People ask me, you know, through the last number of decades: "Why did I join the swim club? Why go to triathlons?" because it takes efforts to go to triathlons, [...]. The payback is the social aspect. The people that are there are usually high-energy people. They're more engaging and they're more entertaining in my view than people that are more likely to be sitting in front of the TV on the couch.

Likewise, P2 shared:

> I do like being with likeminded people and I find that hikers are, that's your common ground. They're outgoing anyway, because if they're hiking they like to go and do.

Conversely, P3 actively avoided spending time with inactive older adults. He explained this choice by stating: “I think the more opportunities you have to be brought over to the dark side, I just feel it's one trap I can do without”. Here, P3 recognizes that certain interpersonal relationships pose a risk to his PA and he purposefully removes this barrier from his social environment.

Controlling aging discourse in social interactions. At times participants were unable to avoid negative interactions. When confronted with negative aging discourse, however, active older adults often interrupted the conversation. For example P1 shared: “I have friends that'll say like: "Oh well, you know, like I'm getting old". I'm kind of like: "Will you stop saying that!"” Similarly P12 shared:

> I have friends that know that if they say to me: "Oh, I’m getting old” I’m just going to say tell them: “Forget that, I don’t want to hear it, put it away”.

Overall, these account demonstrate that participants purposefully create their social environment by actively seeking positive interactions and avoiding or controlling potentially harmful ones.

Community/Organizational Level

Data demonstrate that communities and organizations have unique qualities that affect the PA of active older adults. It is important to note that participants were free to interpret "community" in their own terms. For this reason, community emerged as both groups of individuals and organizations within which their communities had formed. Two over-arching community-level themes emerged (with sub-themes), which are discussed below: a) social support, and b) community characteristics.

Community support. Active older adults found and benefitted from social support given by community members as a collective. When discussing his PA community, which he described as his running group, P3 shared, "There's a community of people around that are like-minded, and if you need that for motivation it's helpful to go and be around people like that. It keeps you engaged". Taking this one step further, P11 shared: "Runners are very gentle people, and they're very generous people. They've helped me with my son, who's sort of been looking for jobs and things. They've met him and talked to him for me. They've been very good". This last example indicates that social support can extend beyond PA into personal life. Overall, participants greatly benefit from the support of other community members.

Sense of Community Belonging. Perhaps from experiences of community social support, participants also developed a strong sense of belonging to their communities. For example, P10 recalled attending a funeral for a family member of a member of her exercise class:

> I said to them: "Well, we're like family, we see each other three times a week, you don't see your family three times a week". We're really closely knit now. We're friends even though we don't go visit each other but we're very close now.

Others shared feeling as they were part of a "family", like P9 who described seeing the same people at different running events across the city: "It is just like a sense of family—no question".

Communities seem to offer active older adults an opportunity to create a sense of belonging that differed from interpersonal relationships. For example, when asked about whether he experienced a strong sense of community to his running club P11 answered, "Very strong. I'm not a person who actually forms these kinds of male bonds. I've made really, really, good friends". This example clearly illustrates how PA communities, such as running clubs and exercise groups, have a unique capacity to create, among and within members, a strong sense of belonging.

Feeling supported by others and engaging in the same activities also seem to create an environment where active older adults were more likely to engage in PA that they would not do on their own. This is best described in the following statement by P13:

> I think there's a combination of positives in that [PA community], there's the continuity of friendships, there's a shared kind of exploration of let's do this kind of stuff, which is really nice. I think you can get into a rut I mean we're all kind of human, so if you have a group there's a willingness to try something new together and that's really very nice.

This example clearly illustrates that active older adults benefit from a greater sense of self-efficacy when acting as part of a group. In these instances they have a greater desire for "exploration" and a greater "willingness" to try new activities.

Community characteristics. Lastly, this community-level theme, captures unique community characteristics that support and/or challenge PA in later life. These characteristics are: a) affordability, and b) inclusivity. The following paragraph outline how these characteristics impact PA in later life.

Affordability. Communities that are affordable increase the likelihood of active older adults paying dues for membership and, in turn, increase the likelihood of engaging in the PA opportunities available to members. Despite having sufficient income, affordability still emerged as a barrier because as P8 noted, "We are retired, we do have limits". Likewise, even activities that are offered at a low cost may challenge PA because of the accumulated cost. For example, P10, who defined her community as the women in her exercise class, stated, " Five bucks every time for a class it certainly adds up". These examples illustrate that affordability may present a barrier to some aging adults however, it is important to note that no participants shared having to disengage in an activity due to cost.

Inclusivity. Participants shared that inclusivity was a supportive community characteristic. For example, P3 discussed how easy it was for him to begin running once he joined the Running Room Run Club, he said:

> They've got lots of things to cater to people from all body types, you know, fitness levels, age levels, that definitely helped me get into it. It helped me understand that I could run, helped me understand that actually, I liked running.

Inclusive communities also meant participants could interact with “people of other age groups” (P12). Overall having a sense that “anybody can come” (P2) was discussed by participants as a facilitating factor for PA.

Sociocultural Factors

Although it is likely that sociocultural factors shape many of the factors discussed in previous sections, data showed unique societal and cultural factors that challenge and/or support the PA of active older adults. At this level two themes emerged. Firstly, participants alluded to the role of government and policy in creating PA opportunities. Further data revealed underlying societal norms of PA and aging shaping discourse and action.

Role of governments and policy/environment. Despite the majority of factors being discussed at the individual, interpersonal, and community/organizational levels it is important to note that some participants described the role of governments in supporting PA in later life. P8 shared a conversation she had with her husband she said:

> My husband keeps saying: "We pay all this money to go keep ourselves healthy so we don't have to keep using the health care system. Why can't they let us have some kind of tax credit on our income tax", you know.

P8, and her husband, demonstrate an understanding that creating policy, which encourages PA in later life, may prevent the onset of age-related health conditions. P8 was not the only participant who recognized the value of top-down action. In a closing remark, P4 shared the following statement:

> I think municipalities can do a lot in terms of providing different kinds of opportunities for different people; in terms of what's available physically like

> walking paths or whatever, as well as making things financially accessible for people.

This example demonstrates knowledge of higher-level action impacting individual behaviour. P4 was not the only participant who recognized the value of top-down action for creating PA opportunities for aging adults.

Creating PA opportunities. Interestingly when opportunities were not available participants created their own. As P1 said, “you need to create it” (P1). For example, P1 started a bi-weekly CrossFit class tailored to adults 60 years of age or older:

> It was one of the owners [Name of Owner], I know him, he and I were talking about this and I said you know you have this opportunity when the gym is not busy to have people like me, […], so’he's like "Okay, well get some friends".

Similarly, P10 was part of a group of women who started an exercise class in their community:

> A couple of my friends and I said, "well, why are we driving?" Half the people in the exercise class we were going to are from Porter's lake, so I said, "This is ridiculous, why don't we have an exercise class?" We got it organized, and so we've all just been going. We've been picking up new people along the way so it's a lifestyle I guess, yeah.

Other initiatives led by participants included a women’s cycling club (P12), a women’s hockey league (P12), and long-distance group bicycle rides (P10). These example clearly illustrate the importance of both bottom up (from the individual to societal) and top down (from societal to the individual) action.

Societal norms of PA and aging. Lastly, societal norms of PA and aging were thought to significantly impact PA. Some participants spoke of PA norms within the context of certain geographical areas, in this case the Nova Scotia. For example, P1 said, “Here in Nova Scotia we kind of have to convince people that it (PA) is good for you”. This observation by P1 is particularly important considering the following statement by P4, “Let me put it this way, if the cultural norm is to be not fit, eat too much and so on then that's how it is. That's reality”. These examples clearly demonstrate that PA norms dictate whether or not individuals are likely to engage in certain behaviours, in this case PA. These quotes also illustrate participants do not think PA is part of the societal norms within this province.

Moreover, societal norms of PA, and aging, also surfaced when participants discussed how they negotiated others’ perceptions of their high-levels of PA at their age. Reactions to these perceptions varied. In some cases, participants chose to hide their age, like P7 who said: “I don't tell people [my age] because they'll think I'm just lying if I told them I lift weights and that”. When asked why she thought they might think she was lying she followed-up with this statement: “I wouldn't want them to feel bad”. While P7 chose to keep her PA levels to herself to not make others uncomfortable, P11 “enjoyed every moment about sticking it to people like that”. This last participant chose to embrace his role as an unconventional older adult. He shared the following anecdote about a trip to England:

> I joined the running club there and I was definitely the oldest person in the crowd, yeah. They would always introduce me as: "Look at him he's 68. He’s back he’s 69”. I love all that. I think old people should, must, find some form of exercise.

This last example demonstrates this participant's role in breaking common stereotypes of the aging adult. Societal norms of PA and aging are an important factor as they dictate responses to active aging adults. On one hand active older adults are challenged and silenced, on the other some are praised and supported. Overall, it is clear by these reactions that active older adults viewed as anomalies in our current society, because of this, as one participant disclosed, "They do treat you differently" (P11).

Paradigm Shift. This final sub-theme captures an understanding of the changing nature of societal beliefs of aging. For example, P4 observed:

> You know, I think traditionally at retirement you just sort of deteriorate and die, right? ... I think now retirement is seen as more of an opportunity to be fit and do the things that you always wanted to do. I think culturally it's really changed a lot.

P5 shared this belief and added the importance of the baby boomer generation in reshaping common understandings of aging, she said, "The baby boomers seem to be the group that's changing everything… things are changing, people realize [PA] is one way to keep them healthy".

Accounts also revealed beliefs that PA in later life is being normalized. For example, P14 recounted how older athletes were perceived when he was younger, he said:

> There was people that ran but they were sort of a very small portion of the society. They were called health nuts, right? Now, in this day and age, exercise is almost considered to be, like if you want to be, you know, a healthy person than an exercise program should be part of your lifestyle.

Accounts at the highest level of the social-ecological model illustrate a paradigm shift from aging as process of slowing down towards a more active lifestyle.

This section demonstrates the factors influencing the PA behaviours of active older adults living in Halifax, Nova Scotia. Noteworthy findings are the importance of perceptions of aging as a psychosocial factor for later life PA, and the utility of the social-ecological model to explore the multitude of factors that influence PA in later life. While the interplay between factors has not been fully developed in this section, it is apparent that the interactions of factors across levels should be considered when developing and implementing PA interventions and programs targeted to older adults. The following chapter explores these factors as they relate to the current body of literature on PA and aging and outlines new and novel contributions to the field.

CHAPTER 5: DICUSSION

The aim of this study was to explore active older adults beliefs about the/their aging process, as well as to outline the multi-level factors influencing PA using the social-ecological model as a theoretical framework. The following chapter will discuss the major findings of this study. Firstly, participants' beliefs about the/their aging process are discussed and contrasted, followed by a bottom-up analysis of emergent age-related factors influencing PA. These findings will be situated within the current literature, and the implications of new and novel findings will be discussed as they relate to the field health promotion.

Section 1: The vs. Their Aging Process

Findings from this study demonstrate that active older adults believe their experience of aging is different from the experience of aging presented in common societal beliefs about aging. Individual beliefs of the aging experience presented this process as controllable and modifiable; Conversely, common societal beliefs about aging were primarily negative, and focused on unavoidable processes of decline. Importantly, data from the present study also suggests beliefs of aging are modifiable. The following section discusses these opposing views (controllable vs. unavoidable) to answer the first research question – *What do they, active older adults believe about the/their aging process*?

Opposing Views of Aging

Similar to previous research on age stereotypes participants noted that society primarily perceived *the* aging process aging as bounded by illness, and a loss of independence and autonomy (Cuddy, Norton, & Fiske, 2005; Löckenhoff, et al., 2009; Ory, et al., 2003).

Conversely, participant beliefs about *their* aging process differed from these beliefs in that they asserted their ability to control aging, at least to a certain degree.

Aging as a process of unavoidable decline. Participants' beliefs about the aging process were mostly negative and focused on biological aspects of aging. This finding was unsurprising given that portrayal of older adults in advertisements, television, books, and media are primarily negative (Lee, et al., 2007; Mason, et al., 2010; Mason, et al., 2015; Zhang, et al., 2006), and given that the topic of the research study (PA) is of the physical domain (Levy, & Leifheit-Limson, 2009). Perhaps because participants from this study were in good health they did not see themselves as "old", nor did they fully endorse beliefs about unavoidable health declines. However, participants disclosed a *profound* fear of aging, likely formed by these beliefs. Findings from a study by Shaw and Langman (2017), exploring the experiences and perceptions of aging in older adults, partially support these findings. They found beliefs about inevitable health declines in later life may lead to general anxiety and fear of aging. In contrast to results of Shaw and Langman (2017), participants from this study shared a much more profound fear of aging. In fact, participants disclosed preferring death to being old and ill. These results indicate that while active older adults do not believe themselves to be "old", they are still aware of, and impacted by, the possibility of embodying negative age stereotypes.

Furthermore, these results corroborate previous studies that suggest active and inactive older adults react differently to negative aging stereotypes (Diogini, Horton, & Bellamy, 2011), and that active older adults have a more agentic discourse of aging than their inactive counterparts (Arnautovska, O'Callaghan, & Hamilton, 2017). Stereotypes of aging that present getting older as a process of inevitable decline lessen the likelihood that older adults will engage

in health behaviours (e.g., PA) because they would be unprofitable (Levy, 2003; 2009; Meisner, & Levy, 2016). It appears, however, that these same beliefs create a fear of aging in active older adults, which appears to facilitate, at least to a certain extent, participation in PA. It is important to note that while these may motivate engagement in PA, anxiety and fear of aging caused by these beliefs may lead to other negative health outcomes unknown to the author.

Lastly, accounts from participants suggest common societal aging beliefs can shape behaviour by portraying aging activities to require minimal exertion, such as "reading the newspaper" or "lawn bowling". Participants also noted these beliefs led other aging adults to use aging as an excuse to disengage from physical activities. Similar to accounts from participants in a study by Grant (2001) exploring experiences of being physically active and playing sport in later life, participants from this research project rejected beliefs that aging alone is a valuable excuse not to engage in PA. These findings should be taken into consideration when planning and implementing programs and interventions that aim to increase later life PA.

Even those who benefit from the highest levels of health in later life are frightened by the prospect of 'old age', which indicates the need to implement strategies that foster positive and realistic expectations of aging. Future research should explore the health implications of fear of aging on health behaviours and health outcomes in later life. Moreover, beliefs about unavoidable declines also dictate the age appropriateness of PA. Health promoters, and other allied health professionals, need to reflect on their own aging perceptions so as not to impose activities onto, or perpetuate stereotypes that lessen the possibilities of moderate- to vigorous-PA in later life. For example, adult day centers have been criticized of implementing infantilizing activities that do not maximize the PA potential of older adults (Salari, 2006). Likewise, PA

programming has been criticized of not providing enough opportunities to the aging population (Jenkins, Eime, Westerbeek, O'Sullivan, & van Uffelen, 2016), and lastly despite the noted health benefits of PA health professionals do not regularly prescribe or recommend PA to aging adults as part of routine care (Petrella, Lattanzio, & Overend, 2007).

Aging as a controllable process. Unlike beliefs about aging as a process of unavoidable decline, participants believed in their ability to exert control over their aging process. Given the topic of the study, control of aging was almost exclusively exerted through engagement in PA as a health promoting behaviour. Research has previously outlined the relationship between PA and control. Results from a PA intervention suggest engagement in PA can change narratives of aging from one of accepting decline, to one of gaining control over aging (Hudson, Day & Oliver, 2015). Likewise, survey data from the second wave of the study of Midlife Development, in the United States, has shown that older adults who report higher sense of control also report higher levels of PA (Cotter & Lachman, 2010). While these results are not new they add to the body of literature on the influence of feelings of control for later life PA.

Interestingly, some participants had conflicting views regarding PA as a means to control aging. While they clearly articulated the benefits of PA for health, they also made statements attributing health to external forces (e.g., luck). This suggests the extent to which PA is believed to control aging occurs on a spectrum. While this study did not use a measure of age stereotype endorsement (e.g., expectation regarding aging scale), it is possible that participants' belief in their ability to control aging is mediated by negative age stereotype endorsement (Sargent-Cox & Antsey, 2015). That is, older adults in this study who have higher endorsement of negative age stereotypes are more likely to attribute aging to external factors such as luck. Research exploring

older adults perception of PA and aging, also suggest that active older adults have higher beliefs in their ability to control aging processes than inactive older adults (Arnautovska et al., 2017). Therefore, it could be that differences in control may reflect the different levels of PA in participants. It is also important to note that individual characteristics may, in part, explain this heightened sense of control. High socioeconomic status and good health – characteristics of this study's population – have both been associated with higher sense of control (Lachman & Firth, 2004).

Although increasing control over aging may seem to be a clear direction for PA interventions, Rowe and Kahn (1998) argued that taking on responsibility for one's aging is potentially an empowering experience. It is important to note, however, that increasing individual responsibility for health may have unwanted negative outcomes (Hudson et al., 2014). Should aging adults lose the ability to exert control over aging (e.g. PA) due to an unexpected loss of resources, or health complications, a strong individual responsibility for health could potentially be detrimental to overall well-being. While it is important to reinforce and promote PA in this cohort, health professionals should beware of placing too much emphasis on individual responsibility for health in aging to avoid victim blaming. It is important to consider that individuals operate within broader systems and are influenced by higher-level factors. As it relates to the present study, behavioural interventions that fail to consider the influence of larger societal beliefs of aging are unlikely to yield desired results.

Modifying perceptions of aging through PA. Lastly, findings from this study suggest aging beliefs are modifiable. Data suggests PA offered participants the ability to critically reflect on their PA accomplishment and modify previous aging perceptions. Active older adults engaged

in a process of critical comparisons between previous and current physical abilities, and between their physical abilities to those of a "stereotypical aging adult". This reflection led to the conclusion that "age really has nothing to do with it" (p3), which opened up new PA possibilities. To our knowledge, this is the first study to describe PA as an opportunity for active older adults to critically reflect on their aging beliefs.

Previous research has shown that adding an educational component, which aims to educate participants that sedentary behaviours are not caused by aging but rather by other modifiable factors, to PA interventions are successful at increasing levels of PA in sedentary and inactive older adults (Sarkisian et al., 2007; Wolff et al., 2014). Importantly, this is the first study, to our knowledge, to suggest PA engagement may be enough to trigger a process of critical reflection on aging and PA, and in turn increase PA. Future research should explore the impact of PA on aging self-perceptions and beliefs about aging.

Significance of Findings

Results from this first research question give valuable lessons regarding the salience and endorsement of popular age stereotypes. Firstly, these results indicate negative age stereotypes, which depict PA as unachievable or futile are still present in our social environments. Active older adults believe societal beliefs of *the aging process* to be different than *their aging process,* indicating that active older adults are aware of negative societal attitudes about aging. Moreover, results suggest active older adults believe societal attitudes play a role in the PA choices of other aging adults, and while they have been able to negotiate these beliefs, others have not.

A second significant result from this finding is that despite partially endorsing the common age stereotype *old and ill – young and healthy* (e.g., fearing old age)*,* active older adults

do not believe this to be unavoidable. In fact, they believe in their ability to control, at least to a certain degree, the aging process. It appears that engaging in PA may prompt a process of critical reflection by which older adults negotiate and reject common societal beliefs that a) moderate- and vigorous-PA is inappropriate for older adults, and b) age-related physical decline is unavoidable. Importantly, this suggests that aging beliefs are modifiable and the associated negative health outcomes can be mitigated. The addition of components targeting aging beliefs as a psychosocial factor to PA is a promising avenue to increase PA maintenance in the aging population. Tracking physical activities as a way to compare *realities* of PA and aging to *beliefs* about PA aging may prove to be beneficial for moderately active older adults to increase and maintain PA participation.

Lastly, it is important to note that while these results are encouraging for the maintenance and increase of PA in moderately active older adults, until beliefs about unavoidable age-related health are challenged, PA will continue to be seen as futile, and the inactive and/or sedentary segment of the aging population are unlikely to adopt this behaviour.

Section 2: Multi-Level Exploration of Age-Specific Factors Influencing PA

When adopting or maintaining PA behaviours active older adults encounter individual-, interpersonal-, community-, and societal-level aging-related factors. These findings add to the knowledge base that supports the use of multi-level strategies to increase PA in later life (Franco, Tong, Howard, Sherrington, Ferreira, Pinto & Ferreira, 2015; Pan, et al., 2009; Sallis, Bauman, & Pratt, 1998; Schmidt et al., 2016). Interestingly, not all aging-related factors were found to be either a barrier or a facilitator; many of these factors are dependent on the context and are mixed factors acting as both a barrier and facilitator to PA. The following section gives a bottom-up

(from the individual to societal level) analysis of the emergent factors addressing the second research question.

Individual Level Factors

This study revealed individual aging-related factors (facilitators – mixed – barriers) to later-life PA. Importantly, the majority of these factors were acquired in later life as a result of the aging process, and presented new challenges or opportunities for participants. Results are outlined and situated within the present literature, and the implications of individual level factors for PA promotion in later life are made.

Aging a time of change. Aging is characterized by a series of important life changes, an example being retirement. Participants disclosed the impact of retirement on PA by changes in two factors – *time and money*. Evidence of the impact of increased time following retirement in the literature is mixed. While some studies indicate an increase in the volume of PA (Godfrey, Lord, Galna, Mathers, Burn, & Rochester, 2013; Koeneman, Chinapaw, Verheijden, Tilburg, Visser, Deeg, & Hopman-Rock, 2012), specifically moderate-intensity PA (e.g., walking) (Zantinge, van den Berg, Smit, & Picavet, 2014), others have found that despite lesser hours spent at work older adults still report lack of time as a barrier to PA (Costello et al., 2011; Booth, Bauman, & Owen, 2002; Hurley et al., 2014). Findings from this study echo the variation in the above mentioned studies. While the majority of participants reported benefitting from an increased amount of time to dedicate to PA following retirement, a small number of participants reported having only "so much time" to engage in exercise, and that other competing activities impeded their ability to be physically active.

Interestingly, one participant spoke of time in regard to lifespan. He noted, as he aged he began to feel his mortality and chose to devote less time to PA and more time with loved ones, particularly his wife. If PA is seen as a means to be healthy in a distant future, coming to terms with one's finite nature may decrease the desire to exercise. Findings from Kotter-Grühn and Smith (2011) partially explain this result, they found that as individuals grow older they report making less plans and lower levels of optimism.

Participants also discussed costs associated with PA. Retirement seemed to "limit" the ability of participants to spend money on PA. While reading this finding, it is important to consider that participants reported a median annual household income of 60 000 – 79 000$, and that 14 out of 15 participants reported an annual household income of above 40 000$. Income has been found to be positively associated with rates of PA in later life (Arendt, 2005; Pan et al., 2009). If even the most affluent of this age demographic consider money as a barrier following retirement, it is likely to be a much greater barrier to those of lower socio-economic status, to those who do not have government pensions, and to those who have secured proper financial planning for retirement.

While these are not new findings they help to clarify how retirement influences PA by changing the availability of *time* and *money*. This increases our understanding of retirement as an important life event, and adds to the literature on factors influencing PA in later life. Moreover, these findings indicate the need to discuss PA as part of the overall retirement planning. Retirement planning interventions that focus on developing time management and financial planning as personal skills may offer older adults the opportunity to overcome PA barriers.

Aging related health changes. Health was also discussed as a changing factor influencing later-life PA. Active older adults in this study shared being in good health "at this age", while also acknowledging age-associated health changes, such as the development of arthritis, or more minimal changes like noticing having to "slow down". Evidence of the effect of age-related health conditions on PA is mixed. While there is evidence to suggest that maintaining and/or preventing, future or further health decline is a key PA motivator for older adults living in long-term care facilities, independent living, and in communities (rural and urban) (et al., 2017; Costello et al., 2011; Hurley et al., 2014; Schmidt, et al., 2016; Weeks, Profit, Campbell, Graham, Chircop, & Sheppard-LeMoine, 2008). There is also evidence to suggest declining health impedes PA uptake (Shutzer & Graves, 2004; Schmidt et al., 2016) and leads to PA disengagement (Schmidt et al., 2016; Weeks et al., 2008).

Unlike older adults who disengage from PA (Schmidt et al., 2016; Weeks et al., 2008), participants in this study found ways to modify PA using compensatory strategies such as lowering the intensity of the activity or finding new PA (Arnautovska et al., 2017; Grant, 2001; Jancey, Clarke, Howat, Maycock & Lee 2009; O'Brien Cousins, 2000). While it is realistic to anticipate some physiological declines as one ages, these results suggest that active older adults differ from inactive or sedentary older adults in that they accept and adapt to their aging bodies. It is likely that participants' knowledge of the importance of PA caused them to find ways to continue this behaviour despite changes in health.

These results support a need for a more thorough investigation of the compensatory strategies used by active older adults. This knowledge would be valuable to guide the development of additional educational resources for other older adults who are challenged by

changing physical abilities in later life (Arnautovska et al., 2017). Additionally these strategies could be taught to those leading aging PA exercises classes as a way to make PA opportunities more accessible to all aging bodies and abilities.

Knowledge of the health benefits of later life PA. Knowledge of the health benefits of later life PA was also found to be a facilitator, while participants mostly gained this knowledge through formal education (e.g., nursing degree) this factor also changed over time as participants gained experiential knowledge of these benefits. This was an interesting finding as knowledge and understanding of the relationship between PA and health in later life is often discussed in the literature as a barrier to PA in the elderly population (Shutzer & Graves, 2004). It appears that older adults lack knowledge of the relationship between moderate- to vigorous- PA and health outcomes (Burton, Shapiro, & German, 1999), and of the specific benefits associated with PA for aging-related health conditions (e.g., maintenance of chronic conditions such as diabetes or osteoporosis) (Jancey et al., 2009). Unlike results from previous research, findings from this study demonstrate that active older adults benefit from specific knowledge of health and PA in later life. In semi-structured interviews participants mentioned not only the health benefits of PA for the aging body, but also the specific benefits of moderate- to vigorous- PA. For example, "cognitive impairment [...] that is associated with aging is probably greatly delayed by vigorous PA" (p11). It is likely that the high levels of education obtained in this group of participants contributed to this knowledge (e.g., Cotter & Lachman, 2010; Pan, et al., 2009).

While there has been a surge in health promoting initiatives aiming to increase the PA levels of older adults - specifically moderate- to vigorous- PA (WHO, 2015), without a clear understanding of what activities meet recommended intensities (Burton et al., 1999), or of the

specific health benefits of PA for the aging adult (Jancey et al., 2009) it is unlikely that the aging population will meet the recommended guidelines. There is a need to find new and accessible platforms to disseminate specific knowledge of aging and PA. Moreover, levels of participation in moderate– to vigorous– intensity activities are low in the population as a whole, therefore regardless of age there is a need to better understand and support moderate– to vigorous– PA.

Triggering events. Data also suggest some active older adults were 'triggered' into PA uptake by an event in mid- to later- life such as workplace stress, serious illness, and changes in family structure (e.g., divorce, new partner). These events provoked participants to re-evaluate their current health status and initiate PA changes to alter their aging health trajectories. Following these events, PA was sought as a way to "make the change" (p.3) towards a healthier life. These findings are crucial as they indicate that older adults can be 'triggered' into making drastic PA changes and dispels the common aging myth "you can't teach an old dog new tricks" (Ory et al., 2003). This is particularly noteworthy given that adopting PA, even in later life, leads to significant health improvements (Hamer, Lavoie, & Bacon, 2017).

To date, literature has primarily focused on retirement (Koeneman, et al., 2012; Godfrey, et al., 2013; Zantinge, et al., 2014), and the death of a partner/spouse (Kenter, Gebhart, Lottman, van Rossum, Bekedam, & Crone, 2014; Koeneman et al., 2012) as critical life events influencing PA in later life. To our knowledge, one other study by Stewart and Smith (2014) exploring gym use in older adults found more mundane incidents (e.g., emotional distress and serious illness) can trigger a similar "turning point in their lives" (p.52). This data explains why the majority of participants in this study reported not being active before mid- to later- life. This was a surprising finding given the extensive body of research to support the importance of early year PA for later

life PA. For example, Chatfield (2015) conducted semi-structured interviews with older adults aged 53-70 exploring life-long PA and found that childhood exercise developed a strong "exercise identity" that was carried on into old age and facilitated later life PA.

The variation between PA histories (lifelong vs. triggering event) is noteworthy and supports previous research which urges for tailored messaging and PA programming in later life (Brawley, Rejeski, & King, 2003; Ory et al., 2003). While this was not the primary objective of this study, it appears that PA histories give valuable insight into later-life PA motivation. In this study, participants who had a history of lifelong PA mainly engaged in PA due to intrinsic motivation (e.g., enjoyment), while those who were 'triggered' into PA are motivated by extrinsic factors (e.g., health rewards). Future research should investigate these differences further as they may help to initiate and sustain later-life PA.

Overall these findings illustrate new and important factors for PA that are capture how changes as one grows older influence engagement in PA. Moreover this suggest there are PA factors that are solely relevant to the aging population, which supports the need for more research exploring *age-specific* factors of later life PA. Furthermore, strategies aiming to raise levels of PA within this segment of the population interventions need to take into consideration the unique changes that are associated with aging and how they may contribute to the adoption or maintenance of health behaviours.

Interpersonal Level Factors

Interpersonal level factors capture the social interactions that influence, for better or worse, the PA of active older adults. At this level, *observing, interacting with*, and *comparing themselves to*, other aging adults influence PA. The following paragraphs outline when these

processes facilitated and when they hindered PA. Findings also elicit processes by which participants controlled their social environment to benefit from facilitators and overcome barriers. Results are outlined and situated within the present literature, and the implications of interpersonal level factors for PA promotion in later life are made.

Observing processes of aging. Firstly, participants reported observing both positive and negative processes of aging in other older adults. Similar to how individual health changes influenced PA, observing health changes in others also influenced this behaviour. Findings from this study are broadly consistent with literature on the impact of age stereotypes. Positive age stereotypes (e.g., other active agers) facilitated PA, while negative ages stereotypes were more complex as they both helped and hindered PA.

Positive age stereotypes. Accounts from active older adults revealed observing positive age stereotypes (e.g., active agers) in others was motivating and facilitated PA. A noteworthy finding is that participants were equally motivated by active agers who were competing in elite sporting events and those who were engaged in leisurely PA (e.g., skating, swimming). Interestingly, these results suggest that active older adults may be more receptive to images of "super fit" agers, which have previously been found to discourage PA some segments of the aging population (Ory et al., 2003). Moreover, these findings could also partially explain why Horton et al., (2008) found varying reactions of older adult to a picture of Ed Whitlock, an elite septuagenarian marathoner.

A second significant finding from this research is that observing positive age stereotypes in everyday life settings can facilitate engagement in health behaviours. While similar findings have been found in previous experimental research that have shown priming older adults with

positive age stereotypes (e.g., guidance, sage, and accomplished) can increase performance on memory tests, and walking speed (Levy, 1996; Hausdorff, et al., 1999), to our knowledge no research to date has shown similar findings in everyday environments.

Negative aging stereotypes. Participants also noted that observing negative stereotypes of aging (unwanted aspects of aging in others) had considerable influence on their PA behaviours. Unlike previous experimental studies which found detrimental impact of negative age stereotypes (Levy, 2000; Levy, 2003), findings from this study suggest exposure to negative age stereotypes can be motivating. Inactive older adults who presented unwanted signs of aging acted as a reminder of the different pathways of aging (e.g., "God this can happen to me".), and the importance of self-care. PA behaviour may be motivated by the desire to avoid physiological declines and age-related health conditions by attempting to differentiate oneself from the stereotypical image of aging (Diogini, 2006; Minichiello, Brown, & Kendig, 2000). It appears that in this group of active older adults, negative age stereotypes were only detrimental when other older adults who embodied these stereotypes limited the behaviours of participants (e.g., participants "slowed down" for them).

Overall, this research grows the current body of literature on age stereotypes, and offers new findings on the facilitating effect of observing both positive and negative age stereotypes in a real world setting. To better understand how age stereotypes can support the adoption and maintenance of PA, future research should explore and compare outcomes of observing active agers in the community, in marketing campaigns (images of active agers), and when activated subconsciously (priming studies) on PA.

Interacting with other aging adults. While the opportunity to be social is a known PA facilitator (e.g., Costello et al., 2011; Zimmerman et al., 2016; Schmidt et al., 2016), a new finding from this study is that not all social interactions are equally beneficial. In fact, active older adults had "no interest in socializing with people who have terrible lifestyles" (P3); instead they sought out individuals who displayed positive aging attitudes and who were active (these characteristics were often equated to one another) as a protective measure. Previous research found the importance of these characteristics for the adoption of PA (Grant, 2001), but to our knowledge, this is the first study to find this seeking out process in older adults for sustained PA.

Participants also noted the lack of available partners in their age group who demonstrate the above-mentioned characteristics. As previously mentioned, social interactions with other active and positive older adults are a significant facilitator to PA. Aging can be an isolating process; there is a need for health promotion initiatives to create opportunities for aging adults to interact and develop supportive friendships in PA settings.

Social comparison. Lastly, active older adults from this study compared themselves to other aging adults. When they perceived their physical abilities to be greater than those who they were comparing themselves to (downward social comparison), it strengthened positive self-perceptions of aging, and in turn, PA. These results support previous research on age stereotypes and social comparison. An experimental study by Pinquart (2002) investigated the effect of exposure to negative age stereotypes on aging self-perceptions. Participants were read a passage that presented adolescents' thoughts regarding older adults. Older adults in the experimental condition heard a passage where adolescents shared negative attitudes of older adults, whereas those in the neutral condition heard a passage where adolescent shared neutral attitudes towards

aging. Results show that older adults in the experimental condition engaged in downward social comparison and found these stereotypes applied to other older adults, not to themselves. Consequently, they were statistically more likely to reject aging-stereotypes than to integrate them as self-perceptions. Similarly, Diogini (2006) found older adults who participated in competitive sports as leisure benefitted from comparing themselves to other "stereotypical imagined or known" (p.186).

Results from this study support previous findings and demonstrate that social comparisons occur outside experimental conditions and that engaging in social comparisons is beneficial to the adoption and maintenance of PA. Individuals who implement programs and interventions for later life PA should take these findings into consideration. While it may be beneficial for active older adults to engage in downward social comparison, being in the presence of active older adults may hinder those who have lesser physical abilities. Given the variety of physical abilities in this age group, PA programming and interventions in later life should be promoted and tailored according to physical ability - not solely by chronological age.

Purposeful construction of social environment. A major finding from this study is the process by which participants benefitted from and/or overcame age stereotypes at the interpersonal level; This was done by purposefully constructing their social environment. Participants chose to attend events, and engage in activities, that would bring them in contact with others aging individuals who represent positive aspects of aging. Often this required additional effort on their part, but the "payback" was worth it. Moreover, active older adults constructed their interactions to overcome interrupting negative aging discourse. The term *selective assertiveness* has previously been used to characterize this interruption pattern in health

care settings (Savundranayagam, Bouchard Ryan, & Hummert, 2007). To our knowledge no previous research has found similar results in social settings.

This is an area that warrants further investigation. There is a need to better understand how older individuals overcome this psychosocial barrier in a PA context. This is important as it may inform the development of new strategies that educate older adults on how to notice and combat the presence of negative age stereotypes to support PA.

Community/Organizational Level Factors

As has been shown by this study's findings active older adults are greatly influenced by the PA communities to which they belong. As mentioned in the result section participants were free to interpret "community" in their own terms. Community/Organizational level factors were discussed primarily as mediating structures, that is; social networks that act as "important sources of social resources and identity" (McLeroy, et al., 1988, p.363). Findings from this study suggests PA communities have the unique ability to gather "like minded" individuals, which generates feelings of community support, a main facilitator at this level. Results also suggest that when communities are inclusive and affordable they facilitate PA uptake and maintenance in later life. The following paragraphs discuss the unique abilities of PA communities to support the adoption and maintenance of PA.

Community support. Perhaps the most important factor at the community level was the distinct ability of PA communities to gather individuals and create among them strong feelings of connectedness and support. Participants benefitted from being surrounded by others who they participated in PA with on a regular basis. While the benefit of social support & social networks for PA have been found at the interpersonal level (Cotter & Lachman, 2011; Horton et al.,

20080; Litwin, 2003; Schmidt et al., 2016), to our knowledge no other research has outlined community support as a factor for later life PA. Even participants, who disclosed not usually forming close bonds with others, felt supported by community members. Community support was described as being beneficial to both adoption and maintenance of PA. Participants felt those with whom they were physically engaged with on a regular basis (members of run/hiking groups, gyms, exercise classes) helped to show them that "being fit is doable" (P3), and helped to keep them engaged. Community support was displayed by keeping community members accountable to show up to exercises classes, by sharing new opportunities for PA to one another, by celebrating each other's successes, and by creating an atmosphere that supported exploration in PA. Two other studies exploring the impact of group PA partially support these findings. A study by Duncan, Travis, and McAuley (1995), found a positive relationship between time spent in PA with others, and a high sense of belonging (Duncan, Travis, & McAuley, 1995), a later study by Bailey and McLaren (2005) finds this relationship to be complex and mediated by more than PA alone.

Community/Organizational characteristics. Participants in this study discussed two community/organizational characteristics that facilitated the adoption and maintenance of PA these were inclusivity and affordability. Inclusivity meant communities were open and welcoming to all ages and abilities, this characteristic facilitated PA adoption. Affordability (e.g., cost of membership) seemed to play a more important role in the maintenance of PA. To our knowledge, no other research has found PA community specific characteristics influencing PA in later life.

While there is a growing body of research exploring the impact of community-level factors on PA they have been primarily been focused on youth (e.g., Goldfield et al., 2017), or obesity management (e.g., Tremblay & Lachance, 2017). There is a notable lack of research investigating PA communities and later life PA. Given findings indicating unique factors and ability of community level factors to facilitate PA future research should aim to understand how these communities contribute to PA uptake and maintenance in later life. Moreover, this research would be valuable to inform the development of interventions and policies that support existing PA communities and the growth of new PA communities. Furthermore, there is an evident need for community level interventions that make use of known community-level facilitators, that is inclusive making PA communities inclusive to all ages, and affordable.

Sociocultural Level

At the highest level, participants disclosed the role of the social environment for later life PA. Common societal understandings of aging, such as those discussed in the first research question (e.g., the association between aging and illness), exert undue influence on the PA choices of the aging population. Despite these primarily negative societal beliefs, it is significant that participants alluded to a paradigm shift towards active aging. A study by Horton et al., (2008) found similar results regarding the "shifting nature of aging stereotypes" (p.1003). It is important to note, however, that this shift is occurring rather slowly given that findings were found almost a decade apart. One must consider the possibility that this perception could be the result of participants creating social environments (e.g., choosing active positive friendship, being a member of PA communities) that may be giving the impression of a paradigm shift while, in fact, this trend is not occurring. This may be the case seeing given that participants'

reported having increased their levels of PA in later life and the positive relationship between age expectations and PA (Breda & Watts, 2017; Meisner, Weir, Baker, 2010; Sarkisian et al., 2005).

Despite this possibility, these findings are hopeful given that misconceptions of what is "age appropriate" in the context of PA may result in serious negative implications for the health of the aging population. For instance, health promotion initiatives have historically not targeted older adults partly because of beliefs that older adults are unwilling or physically unable to take part in PA interventions, and that even if they could it might be "too late" for them to benefit (Ory et al., 2003). Moreover, these results support the need for greater research to understand how social systems contribute to aging beliefs, and how higher-level aging beliefs influence social structures that unknowingly impact engagement in health behaviours. The Nova Scotia Provincial government released a Positive Aging Strategy in 2003, which include a focus on expanding the range of supports and services available to seniors to optimize their health and well-being through health promotion initiatives. Given the importance of age stereotypes as a psychosocial factor for PA addressing attitudes towards aging in provincial strategies may prove to be beneficial.

Role of government and policy. Interestingly, data from this research suggests that participants from this study acknowledge the role of top-down interventions to support the health of the aging population. Some participants shared thoughts on how governments could support later life PA. They suggested the need to develop policies that render PA "financially accessible" and that create supportive environments. Moreover, while participants did not directly state this, they did play a key role in the development of PA opportunities within their communities. This

leads to the conclusion that, as it stands, there are not enough opportunities for older adults to be physically active. Similar findings were identified in an Australian study by Jenkins et al., (2016) which found segments of the aging population were often missed in PA programming. This illustrates the importance of including older adults in decision-making processes regarding future directions for PA. Moreover, this demonstrates that the elderly population play important roles within their communities and do, in fact, "pull their own weight" (Ory et al., 2003). As a society we need to encourage the development of productive roles for the aging population within a PA context and recognize those who are currently shaping PA opportunities.

Study Limitations

The following limitations should be taken into consideration when interpreting the above-mentioned findings. Firstly, participants from this study reported above average annual household income, were Caucasian, and resided within an eight-kilometre radius of the city of Halifax. This means the study population was mainly wealthy, white and urban. Experiences of participants from this group may not adequately represent the barriers to active aging encountered by other active older adults who are of a visible minority, lower socio-economic status, or living rurally. Moreover, the majority of participants were female (10/15), the experiences of aging women may be overly represented, which may neglect important gendered factors influencing PA.

Second, recruitment was achieved primarily through the networks of two organizations, and snowballing. Because of this some participants were members of the same PA communities (i.e., running groups, clubs), or attended the same exercises classes. Given the limited options for group PA tailored to this age group in the Halifax Regional Municipality, this was expected.

However, the methodology of this study calls for the selection of themes not according to "quantifiable measures - rather on whether they captured something important in relation to the overall research question" (Braun & Clarke, 2006 p.82). In this way, the researcher was able to note similarities in participant responses in order not to over represent factors according to the number of time they appeared in interviews, and gave special consideration was given to experiences of participants who had no connection to other participants and different PA routines.

Third, given the self-reported nature of these data and the topic of research, social desirability is another possible limitation. PA in later life is seen as a desirable trait, for this reason it is possible that some participants exaggerated their PA behaviours to seem desirable to the researcher. It is possible that in an attempt to present themselves favourably, participants overrepresented the amount, and duration, of time spent in moderate- to vigorous- PA on the screening tool. To mitigate this possibility the research began each interview by asking the participants whether to explain what they in terms of PA weekly. By doing so, the researcher was able to gather a more thorough understanding of the PA engagement of each participant.

Fourth, the data collection method, face-to-face or over the phone semi-structured interviews may also be a limitation to this study. Meeting individuals on a single occasion to discuss matters of aging may not be enough to build strong rapport. Moreover, because it is easier to connect to an individual when they are seated in front of you, data from face to face interview may have yielded richer data than over the phone interview.

Lastly, it is also possible that the age of researcher may have deterred participants from sharing aging-related factors that they may not want to disclose to someone much younger than

them. While an age difference could potentially increase trust and facilitate the interview process (e.g., the participant identifies with the researcher as a grandchild and makes them feel more comfortable), it may also hinder data collection (e.g., the participant identifies with the researcher as a grandchild, and is less willing to share information of a sensitive nature) (Grenier, 2007). In light of these limitations, it is possible some participants may not have disclosed pertinent information. To mitigate this possibility, the researcher attempted to create genuine connections with each participant either over-the-phone or via email before the time of the interview. Despite these limitations this study collected rich data that have made meaningful contributions to the growing body of research on age stereotypes and PA in later life.

Summary

Chapter 5 has presented a discussion of the findings from this study and placed it within the existing body of literature. Findings from the first research question suggest active older adults have opposing views of the/their aging process. While they belief society views aging as a process of inevitable decline, they also believe in their ability to control their aging process by engaging in PA as a health promoting behaviour. Moreover, results indicate that participating in PA may lead active older adults to reflect on their PA accomplishments and reject common age stereotypes that depict higher intensity PA as 'inappropriate', or 'unachievable', for the aging population. This process of rejecting age stereotypes is important as it points to the possibility that the deleterious health impacts previously associated with negative age stereotypes can be avoided, or mitigated, by engaging in PA. Findings from the first research question point to the need for later-life PA strategies (i.e., interventions, programs, policy) to consider age stereotypes as an important PA factor for the aging population. Furthermore, findings from research question

two have outline individual-, interpersonal-, community/organizational, and societal-level age-specific factors influencing both the adoption and maintenance of later life PA, as well as the processes by which active older adults benefitted from facilitators, and overcame barriers. These findings have practical implications for PA promotion as they inform what facilitators can be optimized, and what barriers need to be removed. Importantly, some factors were mixed, acting as both barriers and facilitators, reiterating the importance of tailoring interventions to the individual.

CHAPTER 6: CONCLUSION

Age stereotypes are an important psychosocial factor influencing later-life PA. Active older adults, to date, have been excluded from the body of literature exploring the impact of age stereotypes (positive & negative). Perceptions of aging are known psychosocial factors for PA in later life. Moreover previous studies have shown that PA engagement is a behaviour that is impacted by multi-level factors. The purpose of this study was to explore, both aging beliefs (positive and negative) and multilevel age-specific factors influencing PA in active older adults. Using thematic analysis as a qualitative methodology, and the social-ecological model as a theoretical framework, to analyze semi-structured interviews, this study attempted to answer the following research questions.

1. What do they, active older adults, believe about the/their aging process?
2. What age-specific factors (barriers/facilitators) do they encounter when adopting or maintaining PA? How have they overcome and/or managed these age-specific PA barriers? How have they benefitted from these age-specific PA facilitators?

This last chapter will give a summary of the main findings, followed by an explanation of the significance and implications of these findings. Recommendation for future research will be made and the implications of health promotion will be addressed.

Summary of Main Findings

To answer the above mentioned research questions this study has outlined a number of findings. The main findings from research question one are as follows: a) active older adults believe society views aging as a process of inevitable decline, however they believe in their ability to control unwanted aging-related health outcomes through PA engagement, and b) PA

gives active older adults an opportunity to critically reflect on their reality as an aging person, compare these beliefs to their socially constructed beliefs about aging, and reject false stereotypes.

Main findings from research question two are as follows; At the individual level: a) active older adults benefit from resources that other non-active older adults do not (specifically knowledge of the health benefits of moderate- to vigorous- PA), b) active older adults overcome age-related health changes by adapting PA to their changing abilities, and c) triggering events are important turning points for the adoption of PA in later life. At the interpersonal level active older adults: a) observe, b) interact with, and c) compare themselves to other aging persons. Lastly, they overcome barriers and benefit from facilitators by purposefully constructing their social interactions. At the community level: a) PA communities have a unique ability to create supportive interactions and environments, b) PA communities have distinctive characteristics that are valuable for the adoption and maintenance of PA. Lastly, at the societal level: a) perceptions of aging and PA are changing, and b) the role of government and policy later life PA is recognized by active older adults.

Significance & Implications

The significance and implications of this study come of both its design and findings. By conducting research with active older adults this study balances the literature previously conducted with sedentary and/or inactive older adults, and provides a new perspective on the age-related factors influencing later life PA. Specifically, these individuals shared previously unknown facilitators that can now be optimized in future PA strategies.

The use of a qualitative methodology is also significant as it adds to this previously quantitatively focused body of literature. Qualitative inquiry was beneficial to uncover subtleties of the aging experience that could not have otherwise been quantified. Another way this study is significant is that it employed the social-ecological model as a theoretical framework. This model is known to be a valuable framework for health promotion research. While previous studies have used this model to explore multi-level factors influencing later life PA, an analysis of the *age-specific* factors had not yet been conducted. These findings have important implications for the development of multi-level interventions, programs, and policies that support the adoption, and maintenance, of PA in later life. This is particularly valuable given the known health benefits PA in later life, and the increasing number of individuals living into old age.

The findings from the first research question are significant as they grow the body of literature on factors influencing later life PA, notably they add to the small body of literature on the impact of positive-age stereotypes. Additionally these findings support previous research establishing aging beliefs as an important psychosocial factor for the adoption, and maintenance, of later life PA. Importantly, findings from this research suggest that age stereotypes are modifiable. Given the established relationship between negative age stereotypes endorsement and negative health-outcomes, these findings are encouraging and have important implications for health promotion. Modifying beliefs about aging, from those of unavoidable decline to those of perceived control over aging, is an encouraging avenue to counter the negative impacts of common age stereotypes and increase rates of PA.

Furthermore, this research is significant as it outlined new multi-level age-specific factors for later life PA. Individual-level results are significant as they illustrate how important changes associated the aging process impact behaviour. One such change is the availability of resources, specifically – time and money. This reiterates the importance of exploring age-specific behavioural factors to meet the unique needs of aging population. Moreover, findings at the individual level suggest active older adults are more knowledgeable of the age-related health benefits of moderate- to vigorous-PA than inactive older adults. This has significant implications for health promotion as it indicates a need for greater awareness campaigns informing the aging population of these benefits. Lastly, findings at this level suggest it is possible to adopt PA later in life, and therefore communication strategies should target those who are not currently active.

At the interpersonal level findings of this study suggest active older adults observe, interact with, and compare themselves to other older adults. These results are significant as they demonstrate age stereotypes are: a) present in our everyday lived environments and, b) influence behaviour. A significant finding is that by purposefully constructing their social environment active older adults can benefit from facilitators and overcome barriers. This has important implications for the development of interventions that teach older adults how to recognize and reject age stereotyping that may lessen their PA possibilities.

One of the most significant implications of this research project are the community level findings. Factors at this level demonstrate how belonging to a PA community can facilitate both the adoption, and the maintenance of PA, in later life. Not only does this open a new area of research for the exploration of later life PA, but it also suggests that interventions which aim to increase membership in PA communities (i.e., running clubs, hiking groups, cycling groups...),

and those that strengthen PA community bonds, would be successful at increasing rates of PA in the aging population.

Lastly, findings at the societal-level have implications for the development of PA policies that support the needs of the aging population. For example, participants suggested tax credits for PA engagement, and the creation of supportive environments. Importantly findings demonstrate active older adults are noticing a need for greater PA opportunities targeted to older adults, and have taken it upon themselves to address this need. This is significant as it indicates the importance of including these individuals in decision-making processes.

Overall, these results are significant as they indicate that when adopting or maintaining PA, active older adults are faced with individual-, interpersonal-, community/organizational-, and societal-level factors. Therefore, increasing rates of PA in the aging population will require multi-level action. Finally, gaining a better understanding of the processes by which active older adults benefit from and/or overcome age-related PA factors is useful for health promoters to create interventions that remove barriers and optimize facilitators.

Recommendation for Future Research

Considering the design of this research project, and its limitations, there are a few recommendations to make for future research. Firstly, findings show that differences in how older adults perceive the aging process is valuable to explain health behaviours in later-life. Given that findings from this research suggest PA may lead to the rejection of age stereotypes, future research should explore the impact of PA interventions on the aging expectations of older adult participants. It would also be beneficial to explore this further in populations of older adults who differ from those in the present study. For example, it would be interesting to see how aging

expectations would alter following a PA intervention in a population of institutionalized older adults. Elaborating on this last point, it would also be beneficial to explore the topic of PA and age stereotypes in populations who are currently not represented, or underrepresent, in the literature. For example, older adults who identify as part of a visible minority, are of lower socio-economic status, and who reside in rural communities, as their experiences are likely to be different.

In regards to the multi-level analysis of factors, findings demonstrate that participants face barriers, and benefit from facilitators at the individual-, interpersonal-, community/organizational-, and societal-level. While the use of the social-ecological model to explore age-related factors yielded important results, the interplay of these levels has not been fully explored. Future research should explore further the interactions between levels for a more comprehensive understanding of how these factors influence behaviour.

Findings from this study have also shed light on other areas that require more research. Importantly this research demonstrates the importance of believing in one's ability to control aging for the adoption and maintenance of PA. Future research should examine the relationship between perceived control and levels of PA in later life. Another interesting finding was changes in PA trajectories following a triggering event. A deeper exploration of this phenomenon would be interesting for two reasons: a) it may lead to better understanding of the motivation for PA adoption, and b) it may establish whether these are suitable moments for PA interventions.

At the interpersonal level, this study found that constructing the social environment allows active older adults to manage barriers and benefit from facilitators. Researchers should explore whether similar strategies can be taught to the aging population to counter the negative

effects of age stereotypes. Above all else, the community/organizational level warrants further investigation. It would be valuable to explore older adults experiences with, and perceptions of, PA communities. Moreover future research should seek to establish the effect of joining PA communities for the adoption and maintenance of PA in later life, and whether belonging to a PA community increases positive perceptions of aging.

At the highest level, by creating PA opportunities for their age group active older adults are currently acting as agents of change in their communities. They have valuable insight into the barriers and facilitators of PA and have demonstrated their knowledge is valuable to the creation of legislation and policy that support PA in later life. The viewpoints of these individuals should be sought out to contribute to the future of active aging in Nova Scotia.

Lastly, key findings from this research demonstrate a need to explore age stereotypes about aging and PA further. For example, to better understand how these stereotypes develop, and may be modified, future research could explore the aging beliefs of those who interact with active older adults, such as fitness instructors or coaches. An examination of how these experiences may impact PA of active older adults also warrants study. Future research could explore the impact of intergenerational programming on aging beliefs, especially of the physical domain. These results would be beneficial to begin creating strategies that address negative stereotypes about aging and PA.

Relevance and Implications for Health Promotion

To conclude, this research has important implications to the field of health promotion. Firstly, findings from this study contribute to the larger body of literature on factors influencing the health of the aging population. Findings from this research also have implications for two of

the five key areas of health promotion – Building healthy public policy, and developing personal skills. Moreover, this research has implications to address high rates of inactivity from an ecological perspective.

When building healthy public policy obstacles to the adoption of these policies need to be identified (WHO, 1986). By identifying negative age stereotypes as an important barrier to the adoption and maintenance of later-life PA, this research has implications for the development of healthy public policy, which considers the impact of this psychosocial factor. Given the rise of the aging population, the creation of policy, which supports engagement in health promoting behaviours such as PA, is valuable to the health of the nation as a whole.

According to the Ottawa Charter for Health Promotion, personal development is supported through "providing information, education for health, and enhancing life skills". Firstly results from this study can inform the creation of educational campaigns that focus on the health benefits of moderate- to vigorous-PA in later life (a known facilitator to active older adults). Secondly, interventions that educate older adults on the potential negative health outcomes of negative stereotype endorsement, and on the ways in which to reject them, may lead to an increase in rates of PA.

Health promotion recognizes that health is the result of the interaction between many factors and that changes in the environment lead to individual level change. By using the social-ecological model, this research is relevant to health promotion as it outlines multiple level age-specific factors influencing the health of the aging population. This information is necessary to create coordinated action from the individual- to the population-level. Given the importance of age stereotypes as a psychosocial factor for PA, addressing attitudes towards aging in provincial

strategies may prove to be beneficial. Overall these findings are relevant as they inform health promotion action that has the potential to enable "people to increase control over, and to improve, their health" (WHO, 1986).

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APPENDIX A: Semi-Structured Interview Guide

Hello,

I am Ariane Seguin, the primary researcher for this project. I am a Health Promotion masters student at Dalhousie University. I am interested in hearing about your experiences of aging and your perceptions of age stereotypes and how these experiences have shaped your PA behaviours. I have questions prepared, but this is more of a friendly conversation then an interview. Do you have any questions before we begin?

- *Can you tell me about what you do to stay physically active?*
    - How often during the week do you do this sport/activity?
    - When you are doing this activity/sport how long do you usually spend in that activity?

Research question A (beliefs about aging)

- *Can you tell me a little bit about your beliefs on aging?*
    - What are some good things/bad things about aging?
    - Have you always believed this about aging?
    - Why do you think you've come to believe this?

Research question B (barriers and facilitators to PA)

Individual

- *When did you begin to be physically active?*
    - Have you always been this physically active? If not what changed?
- *At that time what made it easier/harder for you to be physically active? Nowadays what makes it easier/harder for you to be physically active?*

Interpersonal

- *In general what do think other people in your life think about aging?*
- *What are peoples' general reactions to you when you are out being physically active or when you talk about your PA?*
    - Your family? Friends? Other people you may not know?
    - How do you react to these?
- *Who do you choose to engage in PA with?*
    - Why do you choose to be physically active with them?

Community/Organizational

- *Do you think you belong to any PA communities?*
- *Do you belong to, or often go to, a PA related organization within your community? If so can you tell me a little about it (memberships/clubs)?*
    - Are there many other people your age in this community? Do you think they share the same beliefs of aging you do?
    - Do these beliefs impact your understanding of aging? Does this community and how they understand aging impact your PA behaviour?

- *As an aging person, how does this community help you be physically active as an aging person*
- *Do you find this community to be challenging at times? Why?*

Is there anything else about your experiences of and beliefs about aging and PA you would like to share with me?

Do you have any other questions before we finish?

Thank you very much for your time.

APPENDIX B: Screening Tool

Please fill out the following questions to the best of your ability:

What is your Gender?_____
What is your Age?_____
What is your Ethnicity?_____

*Please circle the answer that best fit your answer. **Note you may circle more than one answer.*

What kind of PA do you engage in?
Cardio ☐
Bone/Muscle-Strengthening ☐

*If you circled **Cardio** please answer the following.*

For how long at a time do you usually do cardio? _____

How many times a week do you usually do you usually do cardio?_____

At what intensity do you usually do cardio *(please circle the best answer)*?

Light – Light to Moderate - Moderate – Moderate to Vigorous – Vigorous

If you circled Bone/Muscle-strengthening answer the following question?

For how long at a time do you usually do you do bone/muscle-strengthening exercises?
_____

How many times a week do you usually do you usually do you do bone/muscle-strengthening exercises? _____

APPENDIX C: Recruitment Poster

Active Older Adults:
Let's talk age stereotypes and physical activity

Are you currently over the age of 60 and exercise for at least 150mins (2:30hrs) per week?
If so, you might be interested in participating in a research project with Ariane Seguin a Master's student from Dalhousie University, and Dr. Brad Meisner, a professor from Dalhousie University.

For more information, contact Ariane Seguin
Email: ariane.seguin@dal.ca **Phone:** 514-706-0331

Active Older Adults:
Let's talk age stereotypes and physical activity

What's the project all about?

We are interested in exploring active older adults thoughts about, and experiences with age stereotypes and physical activity.
This research project will grow the current knowledge of age stereotypes and physical activity at the individual level and also explore ways in which age stereotypes help or hinder physical activity at the interpersonal, institutional, and community level.
Ultimately, this project hopes to better understand how to promote physical activity engagement in later life.

Who can take part?

We are looking to talk to a total of 10 active older adults who are willing to participate in a 45 to 60 minute interview on the topic of age stereotypes and physical activity.
Active older adults must be at least 60 years of age, currently be a resident of Nova Scotia, and accumulate at least 150mins (2:30hrs) of moderate- to vigorous-intensity aerobic physical activity per week.

What does your participation involve?

If you agree to participate you will meet the research for a 45 – 60 minute interview regarding your experiences with, and thoughts about age stereotypes and physical activity in later life.

What's in it for you?

By participating in this study, you may receive a sense of satisfaction for contributing to knowledge on this important topic. You will also be helping us gain more knowledge about the perceptions and experiences of active older adults on age stereotypes and physical activity. Participating in this study might not benefit you directly, but we might learn things that will help others.

APPENDIX D: Invitation to Participate

Invitation to participate in the research project titled: Age Stereotypes and Physical Activity

Dear (Insert Name),
We invite you to take part in a research study being conducted by Ariane Seguin, a MA student of Health Promotion in the faculty of Health and Human Performance at Dalhousie University. We are conducting interviews as part of this research study that will explore beliefs regarding aging and PA, as well as the barriers and facilitators of that relationship. As an active older adult you are an ideal candidate to give us valuable information from your own perspective.
The interview takes approximately 45-60 minutes and will be guided by a set of predefined questions. We are simply trying to capture your experience of aging and PA as an active athlete residing in Nova Scotia. Your responses to the questions will be kept confidential. Each participant will be assigned a number code to help ensure that personal identifiers are not revealed during the analysis and write up of findings.
There is no compensation for participating in this study. However, your participation will be a valuable addition to our research and findings could lead to greater public understanding of age stereotypes and PA.
If you are wiling to participate please fill out the questions below and reply to this email. If you are selected as a participant the researcher will get in contact with you to set a date that suits you. If you have any questions, please do not hesitate to ask.

Thank you,

Ariane Seguin

APPENDIX E: Informed Consent Form

Project title: Age Stereotypes and Physical Activity

Lead researcher:
Ariane Seguin, MA Health Promotion, Faculty of Health and Human Performance, Dalhousie University
Phone: 514-706-0331
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Other researcher:
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Email: brad.meisner@dal.ca

Introduction

We invite you to take part in a research study being conducted by Ariane Seguin, a MA student of Health Promotion in the faculty of Health and Human Performance at Dalhousie University. Choosing whether or not to take part in this research is entirely your choice. There will be no impact on the services your engagement in your society (the Nova Scotia 55+ games) if you decide not to participate in the research. The information below tells you about what is involved in the research, what you will be asked to do and about any benefit, risk, inconvenience or discomfort that you might experience.

You should discuss any questions you have about this study with the lead researcher, Ariane Seguin. Please ask as many questions as you like. If you have questions later, please contact the lead researcher.

Purpose and Outline of the Research Study

The purpose of this study is to look at positive aspects of aging that support the resistance of negative aging stereotypes and promote PA in later life. Specifically the goal of this research is to explore the relationship between age stereotypes (age stereotype) and PA, as well as the barriers and facilitators of that relationship. This study provides an opportunity to better understand the overall experience of the active older adult. The researchers are interested in findings solutions to increase attendance and adherence of PA programming as well as policies that support lifelong PA behaviours. By exploring this topic the researcher hopes to find out a) what are the current beliefs about the aging process of older adult athletes and what factors have shaped these beliefs (Age Stereotypes), b) what factors shape their PA behaviour(s), c) what barriers have they encountered in maintaining or adopting PA behaviour(s) that they attribute to age/aging? How have they overcome or managed these PA barriers? D) What facilitators (e.i.,

opportunities or supports) have they encountered in maintaining or adopting PA behaviour(s) that they attribute to age/aging? How have they benefitted from these PA facilitators?

Who Can Take Part in the Research Study

You may participate in this study if you are **a)** between the ages of 60 to 75, **b)** participate in at least two and a half hours of moderate to vigorous PA weekly as well as muscle and bone strengthening exercises at least twice weekly and **c)** be willing to participate in a 45-60 minute interview on the topic of age stereotypes and PA.

What You Will Be Asked to Do

All participants will be asked to participate in a 45-60 minute in-person or over-the-phone interview on the topic of age stereotypes and PA in later life. In person Interviews will take place in a private, neutral meeting room on Dalhousie Campus. Participants who choose over-the-phone interviews are free to choose the location of their choice for the interview keeping in mind that it is best to find an area that is quiet and will be free of distraction for the entire duration of the interview, the researcher will be in a private room on Dalhousie Campus.

Possible Benefits, Risks and Discomforts

Participating in the study might not benefit you directly, but we might learn things that will benefit others. Participation in this study will grow the current knowledge of age stereotype and PA as well as introduce new methods of research in this field. Results from this study may lead to changes in PA programming, and help shape future policies that support PA in later life.

The risks associated with this study are minimal, while participating in this study you may become bored or fatigued. However, you will be offered breaks between activities to reduce these risks. Moreover you may find discomfort in discussing topics of aging with the researcher.

Participants should note that they are free to leave the interview **at any time**.

Compensation / Reimbursement

No compensation or reimbursement will be given to participants.

How your information will be protected:

All the information that you give us will be kept private. Only the research team will have access to this information. When collecting data we will ensure that rooms are private where others will not see or hear the participants. No third parties will be informed of your choice to participate. If any mail or e-mails are sent to you there will be no identifiable return address or subject lines that discloses study participation.

Once the study has come to completion we will describe and share our findings in a final report that will be submitted for publication and in a presentation for the Nova Scotia 55+ games society. However your anonymity will be respected. No one will know who you are. We will not collect your name, email address, phone number or the IP address that identifies your computer account. Given the nature of this study direct quotations of your experiences may be used in the final report. However, your name and all other identifying information will not be attached to this quotation protecting your privacy. This means that you will not be identified in any way in our reports. The people who work with your information have an obligation to keep all research information private. In the event that abuse or neglect of a child or an adult is revealed, the researchers are required by law to disclose this information to legal authorities. Also, we will use a participant number (not your name) in our written and computerized records so that the information we have about you contains no names. All your identifying information will be kept in a separate file, in a secure place. All electronic records will be kept secure in a password-protected file on the researcher's personal password-protected computer or on a Dalhousie University secure firewalled server.

If You Decide to Stop Participating

You are free to leave the study at any time. If you decide to stop participating at any point in the study, you can also decide whether you want any of the information that you have contributed up to that point to be removed or if you will allow us to use that information. You can also decide for up to one week to decide if you want us to remove your data. After that time, it will become impossible for us to remove it because it will already be de-identified and data analysis will have begun.

How to Obtain Results

We will provide you with a short description of group results when the study is finished. No individual results will be provided. The researcher will ask you if you would like to obtain these results prior to beginning your interview, those who reply yes will be sent the results within a 12 months period.

Questions

We are happy to talk with you about any questions or concerns you may have about your participation in this research study. Please contact Ariane Seguin at 514-706-0031, ariane.seguin@dal.ca) or Dr. Brad Meisner at 902-494-1158, brad.meisner@dal.ca, at any time with questions, comments, or concerns about the research study (if you are calling long distance, please call collect). We will also tell you if any new information comes up that could affect your decision to participate.

If you have any ethical concerns about your participation in this research, you may also contact Research Ethics, Dalhousie University at (902) 494-1462, or email: ethics@dal.ca (and reference REB file # 2016-3969)".

APPENDIX F: Verbal Consent Script

Hello. My name is Ariane Seguin. I am the lead researcher for the project titled: Age Stereotypes and Physical Activity

Before beginning this interview I would like to confirm that you have received and read thoroughly the explanation about this study; That you have been given the opportunity to discuss it with me and that your questions have been answered to your satisfaction; That you understand that you have been asked to take part in an interview that will last approximately 45 – 60 minutes and that those interviews will be audio recorded; That you understand that direct quotes of things you say may be used without identification; That you understand that your participation is voluntary and that you are free to withdraw from the study at any time; and finally that you understand that you may choose to remove any of information you share with me today until one month after your interview is completed.

Do you agree to take part in this study?

[If yes, begin interview]
[If no, thank the participant for his/her time]