

Investigating the Value of Acceptance and Commitment Therapy
and Nintendo Wii Physical Activity for Older Adults

Carson Morse, BKIN (Honours)

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Faculty of Applied Health Sciences, Brock University
St. Catharines, ON

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Abstract

There has been much debate on best practices for limiting negative outcomes associated with relocation, sedentary lifestyle, and social isolation after older adults relocate to a residential care facility. This thesis is an exploration of the novel intervention combining Acceptance and Commitment Therapy with Nintendo Wii gameplay that was designed to improve initiation and adherence to physical activity. Acceptance and Commitment Therapy is an empirically based psychological intervention that utilizes mindfulness and acceptance techniques along with values-based action to improve one's perception of life worth. The primary aim for this thesis was to understand more about the experiences that older adults residing in a residential care facility have with this intervention. Four participants were observed during the intervention and interviewed after the intervention. Multiple forms of analyses were performed such as, inductive interview content analysis, inductive and deductive analysis of observational field notes, deductive analysis of interviews, and deductive analysis of inductive findings. Results revealed that Nintendo Wii gameplay provides a convenient outlet for physical activity where older adults can participate in activities they once enjoyed and individuals with minimal functionality have the capacity to successfully and safely play the Nintendo Wii. Further, older adults prefer to participate in physical activities that are fun and do not feel like exercise; and, participate in small groups rather than large groups. After the intervention only one participant perceived that participation lead to physical health improvements, however, all participants perceived that the intervention increased mental health and social functioning levels. Additionally, all participants understood and were in agreement with the principles of Acceptance and Commitment Therapy, which increased

initiation and adherence to physical activity. The intervention featured in this study could be useful for these purposes with similar participants in residential care facilities, although additional research is necessary to corroborate the findings of this study and to continue developing new knowledge in this area.

Keywords: Acceptance and Commitment Therapy; Nintendo Wii; Older adults; Residential care facility for the elderly; Physical activity

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List of Abbreviations

RCFE	Residential care facility for the elderly
ACT	Acceptance and Commitment Therapy

Chapter 1 – Introduction

The Canadian population has been on a continuous upward shift in age structure since the mid-twentieth century and during the twenty-first century this trend is set to intensify (United Nations Population Division, 2001). This phenomenon, known as population aging, is responsible for the increasing percentage of older adults (aged 65 and over) present in Canada's population. Population aging is largely the result of declining fertility rates, increasing life expectancy, and the aging of the baby boom generation (born between 1946 and 1965) – Canada's largest birth cohort (Health Canada, Division of Aging and Seniors, 2002). Health Canada's Division of Aging and Seniors (2002) estimates that by 2021 the population of Canadian older adults will be 6.7 million, and by 2041 it will reach 9.2 million; 1 in 4 Canadians will be older adults.

Population aging coincides with elevated levels of older adults entering residential care facilities for the elderly (RCFEs), as these individuals seek a residence that provides on-site medical help, daily meals, social connectedness, and safety (Hays, 2002). Although older adults relocate to RCFEs to reap the benefits, these individuals often experience unfavourable adjustments, including: relocation stress syndrome (RSS) (State of Wisconsin Board on Aging and Long Term Care, 2005); sarcopenia (Senior, Henwood, Beller, Mitchell, & Keogh, 2015), reduced physical fitness and functionality (strength, endurance, agility, and flexibility) (Best, Davis, & Liu-Ambrose, 2015; Hybels, Pieper, & Blazer, 2009; Riebe, Blissmer, Greaney, Garber, Lees, & Clark, 2009; Tuna, Edeer, Malkoc, & Aksakoglu, 2009;), mobility limitations and an increased risk of falling (Cruz-Jentoft, Landi, Topinkova, & Michel, 2010); noncommunicable diseases (NCDs) such as arthritis and rheumatism (Public Health Agency of Canada, 2010), osteoporosis (Public Health Agency of Canada, 2010), and cardiovascular

disease (Cavill, Foster, Oja, & Martin, 2006); cognitive decline (Zunzunegui, Alvarado, Del Ser, & Otero, 2003) and an increased risk for developing dementia (Fratiglioni, Wang, Ericsson, Maytan, & Winblad, 2000); difficulty forming relationships, limited social engagement (Canadian Institute for Health Information, 2013), and loneliness (Cornwell, Laumann, & Schumm, 2008; Statistics Canada, 2012); and, depression (Blazer, 2003; Djernes, 2006; Hybels & Blazer, 2003; Sawatzky, Liu-Ambrose, Miller, & Marra, 2007) and anxiety disorders (Bryant, Jackson, & Ames, 2009; Sawatzky et al., 2007).

The plethora of negative adjustments older adults experience after relocation to a RCFE arise partly due to decreases in physical activity; older adults' physical activity levels decrease with age (Cohen-Mansfield, Shmotkin, & Goldberg, 2010) and further decline after relocation to a RCFE (Weeks, Profit, Campbell, Graham, Chircop, & Sheppard-LeMoine, 2008). In addition, when older adults transition from a community-based dwelling to a RCFE, these individuals lose their autonomy, as they place responsibility in the hands of their caregivers (Beauchamp & Childress, 2013). Although older adults relocate to benefit from the care provided at RCFEs, the lack of autonomy that goes hand-in-hand with this care leads to significant stress and unfavourable adjustments (Lee, 2010). Older adults also experience changes in self-perception, social support systems, functionality, and personal possessions after relocation (Golant, 1991; Tuominen, Leino-Kilpi, & Suhonen, 2016), all of which act to further exacerbate the negative adjustments of relocation. Overall, the quality of older adults' physical, psychological, and social health is diminished after relocation to a RCFE, which counteracts the benefits of relocation and leads to increased morbidity and mortality (Rossen, 2007).

Due to the increase of older adults relocating to RCFEs and the associated negative adjustments, there has been much debate on the best practice to promote successful aging after

relocation to a RCFE. A potential factor in easing this transition and promoting a healthy, prosperous life while living in a RCFE may be improving residents' physical activity patterns. For the purposes of this thesis, the term physical activity refers to meaningful engagement in activities that have a physically active component. Older adults' participation in physical activity has numerous health benefits, which are well documented in existing literature and Health Canada's Division of Aging and Seniors (2002) identifies physical activity as a major factor contributing to the healthy aging of the senior demographic. Prior research has demonstrated that physical activity has numerous beneficial effects for older adults' functionality, which include restoring, or maintaining their functional independence (Paterson & Warburton, 2010) and preventing or delaying progressive sarcopenia that eventually leads to frailty (Liu & Fielding, 2011). Moreover, ample studies are utilized to demonstrate the effectiveness of physical activity as a primary and secondary preventer of NCDs; the former addresses the underlying cause of disease and acts to prevent it before it becomes symptomatic, while the latter attempts to detect and treat the disease to halt further progression (Warburton, Nicol, & Bredin, 2006). Consequently, physical activity is deemed beneficial to combat the negative effects of cardiovascular diseases (Bijnen, Caspersen, Feskens, Saris, Mosterd, & Kromhout, 1998; Hakim et al., 1999), arthritis (Suomi & Collier, 2003), and osteoporosis (Liu-Ambrose, Khan, Eng, Janssen, Lord, & McKay, 2004), which are most prevalent among elderly individuals. Furthermore, there is an abundance of studies that have connected physical activity to improved psychological well-being, life satisfaction, quality of life, self-efficacy, and decreased symptoms of depression and anxiety (Babyak et al., 2000; Blumenthal et al., 1999; Bridle, Spanjers, Patel, Atherton, & Lamb, 2012; King, Taylor, & Haskell, 1993; Mura & Carta, 2013; Netz, Wu, Becker, & Tenenbaum, 2005; Schmitz, Kruse, & Kugler, 2004; Teixeira, Vasconcelos-Raposo,

Fernandes, & Brustad, 2013; Tsai et al., 2003; Wipfli, Rethorst, & Landers, 2008;). In addition, multiple studies have been performed on older adults living in RCFEs, all of which demonstrate that physical activity participation is associated with social connectedness (Chen, Hsu, Chen, & Tseng, 2007; Stathi & Simey, 2007). Physical activity participation and social connectedness appear to interact bidirectionally in that, physical activity often promotes social connectedness and forming positive relationships tends to promote physical activity. Together these two constructs act to promote thriving of residents living in RCFEs (Bonifas, Simons, Biel, & Kramer, 2014) and lead to positive health outcomes (Adams, Leibbrandt, & Moon, 2011).

Despite the proven benefits of physical activity, initiating and adhering to a physical activity intervention is exceptionally challenging for the senior demographic (Pender, Murdaugh, & Parsons, 2006). This is often the case due to older adults' constant struggle with negative symptoms and the resulting challenge of inconvenience and discomfort that physical activity provides (Moffitt & Mohr, 2015). More specifically, it is well known that when older adults relocate to a RCFE their psychological health is negatively affected; characterized by the development of RSS (State of Wisconsin Board on Aging and Long Term Care, 2005), and increases in depression (Blazer, 2003; Djernes, 2006; Hybels & Blazer, 2003; Sawatzky et al., 2007) and anxiety (Bryant et al., 2009; Sawatzky et al., 2007). This decrease in psychosocial health, acts as a barrier to exercise initiation and adherence (Williams & Lord, 1995). In addition, healthcare workers in RCFEs often promote sedentary behavior among residents and often use sedative medications to calm their patients in order to make their job easier, which further limits older adults' motivation and ability to engage in physical activity (Galik, Resnick, & Pretzer-Abhoff, 2009). Furthermore, although RCFEs plan scheduled physical activity programs for residents, the type and delivery of these programs often deter residents from

initiation and continual engagement (Benjamin, Edwards, & Caswell, 2009; Chen, 2010; Kalinowski, Wulff, Kolzsch, Kopke, Kreutz, & Drager, 2012). This is the case because RCFE residents are rarely consulted by program developers (Chen, 2010) which does not allow for the development of individualized programs (Costello, Karchinski, Vrazel, & Sullivan, 2011) or education of the benefits of the program (Chen, 2010); consequently, the available programs are meaningless to residents (Costello et al., 2011). Moreover, the plethora of physical health issues and physical pain that RCFE residents experience act as barriers to physical activity. This is the case because older adults often do not believe they are capable of performing physical activity due to their health issues (Benjamin, Edwards, Ploeg, & Legault, 2014; Chen, 2010; Lim & Taylor, 2005) and they often believe that participation in physical activity will result in increased pain (Booth, Owen, & Bauman, 2000; Cohen-Mansfield, Marx, & Guralnik, 2003; Schutzer & Graves, 2004). Overall, understanding the barriers affecting older adults' participation in physical activity programs will allow for the development of proper strategies to promote initiation and continual engagement in physical activity.

A major factor limiting the elderly from engaging in physical activity programs is nonadherence, defined as a resistance to exercise or inability to faithfully engage in an exercise program (Chao, Scherer, Montgomery, Lucke, & Wu, 2014). For this reason, I have developed an exergame-based physical activity intervention which I believe will promote motivation and adherence to physical activity. The American College of Sports Medicine (2013) defines exergames as “technology-driven physical activities, such as video game play, that requires participants to be physically active or exercise in order to play the game.” The Nintendo Wii exergaming console, in particular, has numerous motivational features that I believe will promote RCFE-dwelling older adults' initiation and continued participation in physical activity. These

features include, seeing oneself on screen as an avatar, listening to encouraging commentaries and music during gameplay, and individual game performance tracking (Chao, Scherer, Montgomery, Wu, & Lucke, 2015).

It may be argued that the Nintendo Wii is not designed for older adults; however, this exergaming console has numerous features that appeal to the senior demographic, including: the ability to participate in activities that were once enjoyed, such as playing a virtual game of golf (Kahlbaugh, Sperandio, Carlson, & Hauselt, 2011); hundreds of games to choose from, which enables older adults to continually play games they enjoy (Rosenberg et al., 2010); allowing physically compromised older adults to participate as the Nintendo Wii can be played while the user is sitting (Agmon, Perry, Phelan, Demiris, & Nguyen, 2011); and safe game play (Chao, Lucke, Scherer, & Montgomery, 2015; Chao, Scherer, Wu, Lucke, & Montgomery, 2013; Skjæret et al., 2016). Overall, the Nintendo Wii has the potential to increase physical activity levels in RCFEs due to its motivational features, that act to shift attention away from older adults' functional limitations and fear of increased physical pain through exertion.

Utilizing the Nintendo Wii as a physical activity intervention in attempt to improve the health and overall quality of life of elderly individuals is a relatively new phenomenon. Due to this, there is limited research in this area; however, there is some research in the field that highlights the benefits of participation. More specifically, participation in Nintendo Wii physical activity programs promotes physical health benefits, including improved physical function (Esculier, Vaudrin, Beriault, Gagnon, & Tremblay, 2012; Laver et al., 2012; Mouawad, Doust, Max, & McNulty, 2011); decreased pain, weakness, and stiffness in upper extremity muscles (Hsu, Thibodeau, Wong, Zukiwsky, Cecile, & Walton, 2011); increased maximal leg strength (Jorgensen, Laessoe, Hendriksen, Nielsen, & Aagaard, 2013), improved balance (Agmon et al.,

2011; Chao et al., 2013; Esculier et al., 2012; Franco, Jacobs, Inzerillo, & Kluzik, 2012; Laver et al., 2012; Mouawad et al., 2011; Rendon, Lohman, Thorpe, Johnson, Medina, & Bradley, 2012; Williams, Doherty, Bender, Mattox, & Tibbs, 2011) and balance confidence (Bainbridge, Bevans, Keeley, & Oriel, 2011; Rendon et al., 2012); a decreased fear of falling (Jorgensen et al., 2013); improved walking endurance and ability to transition from sitting to standing (Albores, Marolda, Haggerty, Gerstenhaber, & ZuWallack, 2013); and, increased walking speed (Agmon et al., 2011; Franco et al., 2012; Rendon et al., 2012; Williams, Doherty, Bender, Mattox, & Tibbs, 2011). Furthermore, participation in Nintendo Wii physical activity programs also promotes mental health benefits, including decreases in depression (Li, Theng, & Foo, 2016; Rosenberg et al., 2010) and anxiety levels (Rosenberg et al., 2010); increased positive emotions and self-efficacy (Li et al., 2016); positive changes in self-perception (Wollersheim et al., 2010); and, improved mood (Kahlbaugh et al., 2011) and emotions (Albores et al., 2013). Finally, the Nintendo Wii provides an outlet for social engagement as two people can play this exergaming console simultaneously (Agmon et al., 2011; Chao et al., 2015; Chao, Scherer, & Montgomery, 2015; Esculier et al., 2012; Kahlbaugh et al., 2011;). When the Nintendo Wii is played with a partner, a relationship is developed between players that significantly improves social well-being and decreases the negative effect of loneliness (Agmon et al., 2011; Chao et al., 2015; Kahlbaugh et al., 2011).

Although the Nintendo Wii has numerous motivational properties and psychosocial benefits that should promote engagement in this physical activity program, I hypothesize that older adults will still display some resistance to the program. For this reason, I will lead participants through sessions of Acceptance and Commitment Therapy (ACT) in an attempt to further motivate them to initiate and continually adhere to the Nintendo Wii-based physical

activity program. ACT acknowledges that any kind of change will generate negative and uncomfortable thoughts and feelings; however, these negative thoughts and feelings will only stop one from taking action if he or she allows them to overwhelm him or her and take control. Thus, one needs to be at peace with unwanted, negative thoughts, identify and understand what is personally valuable, and take action. Overall, according to Wetherell et al. (2011):

The goal of ACT is not to reduce the frequency or severity of aversive internal experiences (e.g., thoughts, emotions, sensations, memories, urges), but rather to reduce the struggle to control or eliminate these experiences and increase engagement in meaningful life activities. (p. 128)

If participants are able to overcome their negative feelings associated with initiating the Nintendo Wii-based physical activity program and are able to align this program with their values, I believe they will continually adhere and reap the benefits of the program.

Although there is existing research that displays the beneficial effects a Nintendo Wii-based physical activity program exerts on older adults, qualitative studies with a focus on participant feedback (i.e., views and feelings) when engaged in an intervention that combines ACT with Nintendo Wii physical activity participation are lacking. Thus, research is needed to improve knowledge regarding the potential value of such interventions, with clear implications on improving this type of intervention for the increasing RCFE population of older adults. Based upon this need, I conducted an evaluative case study to examine the experience sedentary and socially isolated RCFE-dwelling older adults had with this program. Using a pragmatic qualitative research approach, I ventured to discover what aspects of the program appeared likely to have affected participants' willingness to participate in programs available at their residence (research question #1). Second, I endeavored to determine if and how the program might have

positively affected participants' perceptions of their physical and psychosocial health (research question #2). Finally, I investigated whether the motivational properties of both the Nintendo Wii and ACT increased participants' motivation to initiate and adhere to a physical activity program (research question #3).

Chapter 2 – Literature Review

Population Aging

In 2015, approximately 16.1% of the population, or 5.8 million of Canada's 35.9 million people were aged 65 and over, marking the first time in history that there were more older adults than youth under age 15 (Statistics Canada, 2015). This trend is also representative of the world's total population according to the World Health Organization. Annually, the population as a whole is growing 1.2%, compared to a 2.6% growth of individuals over 60 (United Nations Department of Economic and Social Affairs/Population Division, 2009). By 2050, the world's population of older adults is projected to be nearly 1.5 billion; a significant increase from 2010 when an estimated 524 million people were aged 65 and over. More specifically, between 2010 and 2050, it is projected that the percentage of older adults aged 85 and over will increase 351% and the percentage of those aged 65 to 84 will increase 188%. Comparatively, the population of those under 65 will increase only 22%, highlighting the severity of population aging in Canada and around the world (U.S. Department of Health and Human Services, National Institute on Aging, 2011).

Due to population aging, Canadian RCFEs are set to experience a large influx of residents in the coming years. Pitters (2002) estimates that by 2031, there will be between 565,000 and 746,000 beds in RCFEs across Canada. McGregor and Ronald (2011) provide a similar, yet more conservative estimate when they state that by 2041 Canada will need 320,000 RCFE beds. Regardless of the estimate, Canada must increase the number of beds in RCFEs to accommodate the rising population of older adults.

Negative Outcomes Associated with Relocation to a RCFE

As age increases, living in a community-based setting is a top priority for older adults as they often associate RCFEs with dependency and mortality (Leggett, Davies, Hiskey, & Erskin, 2011). Despite this preference, between 18% and 33% of North American adults aged 85 and older seek residency at RCFEs (Banerjee, 2009). Although relocation is viewed negatively by older adults, they do so amid concerns over their health or that of their significant other, for help with daily household chores such as cooking and cleaning, the inability to properly care for and maintain their home and yard, social isolation in their community-based home, and enhanced safety that RCFEs provide (Hays, 2002). These attractive features entice older adults to relocate to a RCFE, but when they make this monumental life change, they often experience significant stress.

The North American Nursing Diagnosis Association deemed the term ‘relocation stress syndrome’ (RSS) to characterize the significant physiological and psychological stress a person experiences during relocation to long-term care (State of Wisconsin Board on Aging and Long Term Care, 2005). This increased level of stress is largely the result of major losses that accompany relocation, such as changes in self-perception, social support systems, mobility, and personal possessions (Golant, 1991; Tuominen et al., 2016). In addition, “institutional rules, policies, and practices can compromise older people’s autonomous choices” (p. 23), which further enhances the stress of relocation to a RCFE. For example, rules set to ensure the quality of care may remove older adults’ autonomy and disable them from making their own choices; caregivers often override older adults’ choices (Beauchamp & Childress, 2013). Overall, relocation to a RCFE is considered one of the most stressful events an older adult has to deal

with (Lee, 2010) and coincidentally, associated negative outcomes result in increased morbidity and mortality (Rossen, 2007), which counteracts why the older adult relocated in the first place.

As older adults transition to RCFEs, they are faced with a plethora of negative adjustments stemming from their relocation, which consequently diminish their quality of life. These negative adjustments are the result of RSS in combination with decreased physical activity levels when transitioning to a RCFE (Weeks et al., 2008). Research by Salguero, Martinez-Garcia, Molinero, and Marquez (2011) on 436 older adults, highlights that community-dwelling people have significantly higher values in total activity time and weekly energy expenditure than their RCFE-dwelling counterparts. This lack of physical activity leads to a diminished functional capacity in RCFE residents (Mancini, Matsudo, & Matsudo, 2014), which in turn promotes a loss of independence and reduced quality of life (Hirvensalo, Rantanen, & Heikkinen, 2000). One major factor highlighting the reduction in functional capacity is the prevalence of sarcopenia among older adults living in RCFEs; 40.2% of these people exhibit sarcopenia, most of which are very severe cases (Senior et al., 2015). The perceived lack of motivation or inability to participate in physical activity after transitioning to a RCFE and the corresponding loss of muscle mass renders most older adults incapable of reaping the benefits of physical activity.

Negative adjustments associated with relocation to RCFEs are further intensified when older adults experience a lack of friendships and interpersonal connections after their move (Bonifas et al., 2014). Research by Bonifas et al. (2014) concludes, “living in a [long-term care] home has substantial impact on the context, quality, and nature of social relationships, with the greatest impact stemming from the level of health decline and functional limitations among facility residents” (p. 1335). It is well known that older adults value friendships, however, residents in RCFEs are often too medically compromised to form interpersonal connections. As a

result, an overwhelming number of older adults found it difficult to form satisfactory relationships that moved beyond casual acknowledgement of others in the RCFE (Bonifas et al., 2014). According to the Canadian Institute for Health Information (2013), 46% of nursing home residents in Ontario, Manitoba, British Columbia, Nova Scotia, Newfoundland and Labrador, and Yukon reported limited or no social engagement. Older adults in this situation often suffer from RSS and fall into a depressive, debilitating state that negatively affects their quality of life (Bekhet, Zauszniewski, & Nakhla, 2008). In response to this, healthcare professionals need to implement a new system focused on improving older adults' social functioning after relocation to a RCFE.

After relocation to a RCFE, the significant rise in stress, characterized by RSS, in conjunction with difficulty forming social relationships, greatly affects older adults' mental health. Behket and Zauszniewski (2012) found that older adults reporting feelings of loneliness were more likely to exhibit symptoms of anxiety and depression. Numerous studies have documented high rates of depression among older adults in RCFEs compared to community-dwelling older adults (Blazer, 2003; Djernes, 2006; Hybels & Blazer, 2003). In addition, the Canadian Institute for Health Information (2013) highlights that 30% of RCFE residents reported signs of depression. Moreover, research shows that between 1% and 28% of older adults in clinical settings (i.e., RCFE or hospital) have been diagnosed with an anxiety disorder (Bryant et al., 2009). More alarming than the aforementioned statistic is the finding that 15-56% of older adults who experience symptoms of anxiety remain undiagnosed with any form of anxiety disorder (Bryant et al., 2009). In sum, the quality of older adults' physical, psychological, and social health is diminished after relocation to a RCFE.

Negative Outcomes Associated with Sedentary Lifestyle

As a population demographic, seniors are the most sedentary age group in Canada despite evidence that suggests up to 95% of older adults believe physical activity is beneficial to them (Crombie et al., 2004). According to the Canadian physical activity guidelines, to achieve health benefits, older adults must engage in at least 150 minutes of aerobic physical activity per week that occurs in 10-minute intervals or more and is of moderate-to-vigorous intensity (Canadian Society for Exercise Physiology, 2012). Only 44% of older adults are considered physically active or moderately active and 56% are inactive; whereas, 72% of those aged 12 to 19, 58% of those aged 20 to 34, and 51% of those aged 35 to 64 meet the Canadian Physical Activity Guidelines (Statistics Canada, Canadian Community Health Survey, 2013). This highlights the decline in physical activity with increasing age. In addition, after a review of literature, Cohen-Mansfield et al. (2010), found evidence through both longitudinal and cross-sectional studies, that declines in physical activity are associated with increasing age. Overall, the plethora of research done in this area has found strong evidence that age and physical activity are inversely related.

The combination of population aging and increasing levels of sedentary behaviour among Canadian elders is cause for concern. As individuals become older and less physically active their physical fitness and functionality (strength, endurance, agility, and flexibility) are reduced, which limits multiple domains including mood, social connectedness, and performing activities of daily living (Best et al., 2015; Riebe et al., 2009; Tuna et al., 2009). Blair (2009) reports in the *British Journal of Sports Medicine* that physical inactivity is the most important public health problem of the twenty-first century. Although it may seem implausible that physical inactivity tops the list, the World Health Organization (WHO) further confirms the negative effect of

physical inactivity on public health. For example, according to their (WHO) 2002 report, physical inactivity was responsible for 1.9 million premature deaths and was one of ten powerful risk factors for premature death.

Increasing age and a lack of physical activity promote anatomical and physiological changes in muscle tissue that negatively affect physical fitness. Specifically, muscle fibers are reduced in number and size, which cause muscle mass and the number of motor neurons present in the body to decrease (Knight & Nigam, 2008). Over time, progressive sarcopenia will leave the body with limited strength, endurance, and power (Nikolic, Vranid, Arbanas, Cvijanovic, & Bajek, 2010), which will result in additional decreases in functionality. This progressive decline in functionality is a strong predictor of disability (Cayley, 2008) and low physical function (Hybels et al., 2009). Consequently, older adults with sarcopenia will experience mobility limitations, a loss of independence, an increased risk of falling, reduced quality of life, and an increased risk of mortality (Cruz-Jentoft et al., 2010). Sarcopenia can be delayed if physical activity recommendations are followed, however, if physical inactivity persists, older adults risk losing between 10% to 40% of their muscle mass and joint motion (Milanovic, Pantelic, Trajkovic, Sporis, Kostic, & James, 2013). Older adults' physical activity levels must be a focal point for healthcare professionals because when compared to individuals 60 years of age and under, older adults exhibit twice as many disabilities and four times as many physical limitations (Milanovic et al., 2013).

The decline in physical activity and functionality that accompany old age collaboratively act to promote the development of noncommunicable diseases (NCDs). The WHO (2015) defines NCDs as chronic diseases that are of long duration, progress at a slow rate, and are nontransferable between humans. According to Booth, Gordon, Carlson, and Hamilton (2000),

the significant rise in NCDs during the latter part of the twentieth century can be largely attributed to decreases in physical inactivity. This inverse relationship is responsible for why in 2009, 89% of Canadian older adults reported having at least one NCD (Public Health Agency of Canada, 2010).

According to the Chief Public Health Officer's Report on the State of Public Health in Canada (2010), arthritis and rheumatism are the most prevalent NCDs in the senior demographic, as 44% of Canadian seniors are affected. After age 74, 85% of the Canadian population identifies that they are affected by osteoarthritis (Public Health Agency of Canada, 2010). Decreasing bone mass also affects Canadian older adults, as 35% exhibit osteoporosis – 29% of females and 6% of males (Public Health Agency of Canada, 2010). Moreover, in their recent work, Cavill et al. (2006) provide strong evidence that when compared to physically active individuals, those who are physically inactive have up to double the risk of cardiovascular disease. In Canada, many older adults live with at least one cardiovascular disease, as 56% have high blood pressure, 23% indicate some form of heart disease, and 4% have suffered a stroke (Public Health Agency of Canada, 2010). Overall, NCDs work alone or in combination to cause pain, reduce functionality and physical fitness, limit activities of daily living, and reduce quality of life (Suomi & Collier, 2003).

In older adults, the development of an NCD contributes to psychological distress (Dang, 2010; WHO, 2016), largely in the form of depression and anxiety (Sawatzky et al., 2007). Older adults dealing with NCDs and resulting psychological difficulties are at the highest risk for physical inactivity (US Department of Health and Human Services, 1996) and reduced quality of life (Antunes, Stella, Santos, Bueno, & deMello, 2005). Research by Da Silva et al. (2012) highlights the negative influence of physical inactivity on mental health when it is suggested that

there is an inverse relationship between physical activity and symptoms of anxiety and depression. This declining mental health paired with increasing age and a lack of physical activity work to limit older adults' independence, cause limited mobility, chronic pain, frailty, and other physical and mental issues (WHO, 2016). The Standing Senate Committee on Social Affairs, Science and Technology (2005) indicates that in Canada, approximately 20% of older adults live with a mental illness. Of these older adults, 3% to 5% have been diagnosed with major depression and approximately 15% experience significant levels of depressive symptoms (Canadian Psychological Association, 2014). Depression in older adults must be of high importance to healthcare professionals because it is the leading factor for suicide in old age and it makes older adults two to three times more likely to commit suicide (Canadian Psychological Association, 2014).

Depression amongst the elderly also causes a significant decline in their cognitive abilities, which causes additional decreases to physical and social activities (Fiske, Loebach Wetherell, & Gatz, 2009). In addition, healthcare professionals need to be cautious of anxiety in old age, as Gauthier (2005) highlights that anxiety disorders are at least two times more prevalent than depression in older adults. This is of importance because older adults' quality of life is negatively affected by the symptoms of anxiety, even though they have not been diagnosed with a disorder. Overall, depression, anxiety, physical inactivity, and age act independently or in combination to result in poor physical and psychosocial functioning (Lenze et al., 2001).

Social Isolation and Loneliness in Older Adults

As individuals mature in age they often experience a decline in social engagements as most older adults' social roles are altered due to changes such as retirement, death of aging friends, children growing up and leaving home, mobility limitations, sensory impairments, and

NCDs (Alpert et al., 2009; Grenade & Boldy, 2008). As a result, older adults may have limited opportunities to interact and participate in society (Cornwell et al., 2008) and will become increasingly lonely. According to data presented in the 2008-2009 CCHS focused on Healthy Aging, 20% of Canadians aged 65 years or older reported feeling lonely some of the time or often (Statistics Canada, 2012). The percentage of older adults feeling lonely some of the time or often increases to 25% after age 84, highlighting the direct relationship between age and loneliness. Although social participation decreases with age, this survey identifies that in the past year, 24% of older adults in Canada would have liked to participate more in social, recreational, or group activities (Statistics Canada, 2012). The following obstacles were identified as factors negatively influencing older adults' social participation: health limitation (33% of men, 35% of women), being too busy (28% of men, 16% of women), not wanting to go alone (9% of men, 17% of women), external factors such as cost, availability, time, or location of the social event (4% to 9% of older adults) (Statistics Canada, 2012). Overall, the results of the 2008-2009 CCHS on Healthy Aging highlight the need to provide more opportunities for older adults' social engagement in attempt to improve the social functioning of this age demographic in Canada.

Social isolation and resulting loneliness in older adults should be taken seriously as the literature identifies these as significant health risks among this population. Social isolation can cause mental health problems and evidence shows that it plays a major role in the development of late-life depression (Anderson, 2001). Loneliness in older adults also subjects them to cognitive decline (Zunzunegui et al., 2003) and increases their risk of developing dementia (Fratiglioni et al., 2000). A meta-analysis by Masi, Chen, Hawkey, and Cacioppo (2011) utilized 148 studies focused on the relationship between social isolation and mortality. The results of this meta-analysis identified that decreased social support is also linked to increased mortality and

vice versa. The relationship between decreased social support and increased mortality was so significant that the authors deemed social isolation to be as strong of a risk factor for mortality as smoking, obesity, or lack of physical activity.

Health Benefits of Physical Activity

Benefits to Physical Health and Non-Communicable Diseases. Physical activity for older adults, especially those living in RCFEs, is an important tool that significantly improves their physical functioning. In a longitudinal study by Hatch and Lusardi (2010), 36 assisted living residents aged 72-96 participated in a physical activity intervention consisting of upper and lower extremity strengthening and flexibility exercises, balance training, postural control activities, and aerobic training. Evidence from this study highlighted that exercise can indeed increase leg strength and balance and reduce the risk of falling in older adults. Overall, the researchers concluded that participation in this program as little as twice a week for nine months is satisfactory for protecting older adults living in assisted living settings against functional decline and its associated negative outcomes. In addition, a study by Baum, Jarjoura, Polen, Faur, and Rutecki (2003) highlights that physical activity is an important tool to delay disability and improve functioning in frail older adults. A sample of 20 frail residents from a long-term care home participated in a physical activity intervention that utilized simple equipment, such as elastic resistance bands, to conduct range of motion and strength training exercises. All of the older adults experienced positive results from this intervention; and, linking the results to other studies of similar nature allowed the authors to conclude that the frailest older adults experience the greatest benefit from exercise. Moreover, a systematic review conducted by Paterson and Warburton (2010) highlights that following the recommended physical activity guidelines is associated with a 30-50% reduction in the risk of functional limitation and disability.

Understanding the cumulative results of these studies provide insight that physical activity interventions are beneficial for all older adults, as they promote increases in muscular strength, endurance, and power, which consequently act to improve functionality, independence, falling risk, quality of life, and mortality rates.

The progressive population aging that Canada is experiencing places physical activity in the spotlight, as exercise acts to reduce the risk of NCDs and associated rates of mortality (Kruk, 2009). Physical activity as both the primary and secondary preventer of NCDs is adequately summarized when Sawatzky et al. (2007) state that it “reduc[es] the likelihood of acquiring additional chronic conditions [and] delay[s] the progression of current chronic conditions” (p. 9). For the purpose of this literature review, the beneficial effects of physical activity on cardiovascular diseases, arthritis, and osteoporosis will be discussed, as they are the most prevalent in the senior demographic. Research linking physical activity to a reduced risk of cardiovascular disease in older adults is sparse, however, there are two large-scale studies from the late 1990s that have demonstrated this relationship. More specifically, the walking patterns of 2678 males’ aged 71-93 were studied for four years during the Honolulu Heart Program. This research concluded that men who walked 1.5 miles per day had their risk of coronary artery disease decreased approximately 50% compared to men who walked fewer than 0.25 miles per day (Hakim et al., 1999). In the Zutphen Elderly Study by Bijnen et al. (1998) the walking and cycling patterns of 802 males’ aged 64-84 were studied for ten years. This research concluded that men who walk or cycle at least 3 times per week for 20 minutes had their mortality risk of coronary artery disease decreased by 31% compared to those who were less active. Furthermore, there is evidence that older adults with arthritis can significantly benefit from an exercise intervention. Research by Suomi and Collier (2003) focused on 20 participants aged 60 – 79

years who were living with arthritis. These participants completed a 45-minute exercise intervention twice a week for 8 weeks, either on land or in a pool, and then performed 12 functional fitness tests, 4 activities of daily living, and 8 hand-held isometric strength tests. Compared to pre-exercise intervention measures, the participants displayed significant improvements in 9 of the 12 functional fitness tests, 3 of the 4 activities of daily living, and 7 of the 8 hand-held isometric strength tests. Due to these results, the authors concluded that an 8-week exercise intervention can effectively improve functionality, physical fitness, and the perceived ability to perform activities of daily living in older adults living with arthritis. Moreover, research by Liu-Ambrose et al. (2004) has identified physical activity as a means to maintain bone health and combat osteoporosis. In this study, 98 women aged 75 to 85 with low bone mass were randomly assigned to a resistance training ($n = 32$), agility training ($n = 34$), or stretching (sham) exercises group ($n = 32$). Each group completed their exercise intervention twice per week and after 25 weeks the researchers found that the agility training group increased their cortical bone density at the tibial shaft by 0.5% ($\pm 0.2\%$) and the resistance training group increased their cortical bone density at the radial shaft by 1.4% ($\pm 0.6\%$). These results compared to a 0.4% loss ($\pm 0.3\%$) in the stretching (sham) group's tibial shaft cortical bone density prove that exercise is beneficial for older adults attempting to stall and even improve bone density and osteoporosis.

Mental Health Benefits. In recent years the mental health status of Canadians has generated significant attention and, consequently, healthcare providers have become increasingly focused on improving the mental health status of all residents. Currently, treatment choices for older adults include medication in the form of antidepressants, psychotherapy, electroconvulsive therapy (ECT), and exercise programs. Although these treatment modalities improve the mental

health status of elderly individuals, antidepressants and ECT often promote side effects that cause negative outcomes amongst older adults. For example, antidepressants may cause headache, nausea, difficulty sleeping, restlessness, anxiety, agitation, or sexual problems, while ECT may cause confusion and memory loss (U.S. Department of Health and Human Services, 2015). In contrast, physical activity interventions have been shown to improve psychological well-being, which results in reduced levels of depression and anxiety with no associated negative outcomes (Teixeira et al., 2013).

There is an abundance of evidence that highlights the role that exercise plays in mitigating depression during later life. In a systematic review of nine studies and a meta-analysis of seven studies, Bridle et al. (2012) conclude that prescribing a structured, individualized physical activity program for older adults (mean age = 75.7) will reduce the severity of depression. Moreover, a systematic review of ten randomized, controlled trials comparing exercise to standard treatments or no treatment for depression yielded similar results. Mura and Carta (2013) concluded that physical activity interventions exert beneficial clinical effects and act to alleviate depressive symptoms in depressed individuals aged sixty years old and above. In addition to these studies, other research has shown that exercise can yield increased benefits when compared to other forms for alleviating late life depression. More specifically, multiple studies highlight the increased benefit of exercise over the use of antidepressant medications (Babyak et al., 2000; Blumenthal et al., 1999). Furthermore, because late life depression is associated with decreased physical functioning and NCDs, exercise is the preferred form of treatment for depression, as it is able to limit other negative outcomes of aging simultaneously (Fiske et al., 2009).

In terms of anxiety, there is a lack of methodologically sound literature focused on utilizing exercise to improve anxiety within the elderly population. However, there is one study of 357 participants aged 50 – 65 years, randomly assigned to either a control group (no exercise), a higher intensity exercise group, or a lower intensity exercise group. Researchers concluded after one year, that exercise, regardless of intensity, resulted in significant decreases in anxiety (King et al., 1993). Another study by Tsai et al. (2003), utilized a 12-week Tai Chi Chuan exercise program in attempting to decrease anxiety levels. 152 participants were randomly assigned to either an exercise program (3 sessions per week for 30 minutes each) or to sedentary behaviour. After the intervention, anxiety decreased for all participants in the exercise group, allowing researchers to conclude that an exercise intervention was beneficial for limiting anxiety. Although these two studies (Schmitz et al., 2004; Tsai et al., 2003) highlight the positive effect of exercise on anxiety, participants in these studies were not experiencing clinically significant anxiety prior to the exercise intervention, rendering results inconclusive. Moreover, there is one meta-analysis that highlights the significant benefit of exercise for anxiety reduction, with the only limitation being that all studies included used self-report questionnaires to measure anxiety (Wipfli et al., 2008). Despite this being considered a limitation by the researchers, the conclusion can still be made that exercise benefits self-perceived symptoms of anxiety. In addition, evidence suggests that depression often coexists with anxiety (Frasure-Smith & Lesperance, 2008), and because higher levels of physical activity are associated with increases in health-related quality of life and wellbeing (Schmitz et al., 2004), it is plausible to conclude that physical activity acts to limit symptoms of anxiety.

Social Functioning Benefits. Participation in physical activity is especially important for older adults who identify as being lonely because it acts to improve their social relations, which

contributes to optimal aging and longevity (Aranceta, Perez-Rodrigo, Gondra, & Orduna, 2001). This is the case because physical activity provides an outlet for older adults to interact with one another and form social networks. In turn, these newly formed relationships provide older adults with feelings of well-being, improved physical functioning, and improvements in quality of life (Ehrman, Gordon, Visich, & Keteyian, 2009). In addition, social relationships may strengthen older adults' adherence and engagement to physical activity because forming new relationships often elicits feelings of increased self-efficacy, meaning and purpose, and mental health (Adams et al., 2011; Berkman, Glass, Brissette, & Seeman, 2000). These positive feelings often act in combination to promote continued and additional adherence to physical activity because the potential of forming stronger or new relationships (Fiori, Antonucci, & Cortina, 2006).

Numerous studies have been performed on RCFE-dwelling older adults, all of which indicate that physical activity participation is associated with social connectedness. In a longitudinal study performed by Chen et al. (2007), twenty-eight RCFE-dwelling older adults were recruited to participate in a Tai Chi exercise intervention twice a week for six months. After the intervention the authors concluded that participation in this program promoted increased social functioning in older adults and improved their quality of life. Furthermore, a qualitative study by Stathi and Simey (2007), focused on seven nursing home residents aged 86 to 99 as they participated in a six-month exercise intervention. After the intervention, the researchers interviewed the participants and concluded that participation in a physical activity program provided older adults living in nursing homes with increased social interaction and fun. These two studies align with a literature review by Adams et al. (2011), as they all identify a link between social participation and positive health outcomes among the elderly population. This literature review utilized 24 cross-sectional and 18 longitudinal studies focused on the effect that

older adults' social and leisure activity participation had on their general health and wellbeing. The researchers identified that social participation lead to positive outcomes including reduced risk of disability (Lund, Nilsson, & Avlund, 2010), better cognitive health (Engelhardt, Buber, Skirbekk, & Prskawetz, 2010), better self-perceived health (Sirven & Debrand, 2008; Zunzunegui, Kone, Johri, Beland, Wolfson, & Bergman, 2004), and improved health-related behaviours (Adams et al., 2011). In sum, participating in meaningful activities, developing and maintaining relationships with others, and avoiding social isolation are needed for the successful aging of Canada's older adults (Statistics Canada, 2012).

Barriers to Physical Activity in Older Adults

With increasing age, older adults face a growing number of barriers that act to erode their ability, confidence, and desire to participate in physical activity (Pender et al., 2006). Nearly 90% of older adults claim that there is at least one barrier that prevents them from becoming physically active (O'Neill & Reid, 1991). If older adults are able to overcome these barriers and initiate physical activity, research shows that continual adherence to this program will also be troublesome. Choa, Foy, and Farmer (2000) estimate that half of the older adults who begin a physical activity intervention will give up and back out within six months. The barriers that negatively affect older adults' exercise patterns are wide-ranging and individualized, yet they all create difficulties with exercise initiation and adherence. Throughout the following section, the barriers that have the largest effect on older adults physical activity and motivation will be explored. This is essential in order to develop strategies that will increase their motivation for continual physical activity.

Relocation to a RCFE. When older adults relocate to a RCFE, their personal ability and available resources for initiating and adhering to a physical activity intervention are significantly

restricted (Chen, 2010). It is known that when older adults negatively transition to a RCFE they experience great fear and stress, as characterized by RSS (State of Wisconsin Board on Aging and Long-Term Care, 2005). These negative feelings paired with a loss of autonomy after relocation creates additional stress, depression, and anxiety (Thomasma, Yeaworth, & McCabe, 1990). Research by Williams and Lord (1995) found that stress and depression negatively affected exercise adherence so the argument can be made that relocation to a RCFE acts as a barrier to physical activity. In addition, because older adults seeking relocation are becoming increasingly old and frail, constraints are placed on RCFE staff, which makes it challenging for them to promote physical activity (Benjamin et al., 2009). For example, Galik et al. (2009) reports that to prevent behavioural outbursts, nursing assistants reinforce sedentary behaviour (i.e., utilizing sedative medications to calm their patients) in order to be able to provide care as quickly as possible sometimes which acts to significantly decrease their ability and motivation to participate in physical activity. Although older adults relocate to RCFEs in attempt to improve their quality of life, it is inevitable that this relocation will negatively affect residents' motivation for and adherence to physical activity.

Physical Health Issues. The health status of an individual is one of the most important predictors of their current and future health behaviours (Hwu, Coates, & Boore, 2001). Increasing age and relocation to a RCFE promote a decrease in physical functioning (Mancini et al., 2014) so physical health problems and functional limitations appear to be a primary barrier for older adults' physical activity participation (Chen, 2010). This conclusion is supported by an abundance of research identifying limited mobility, poor eyesight, dizziness, lack of energy, arthritis, heart disease, and stroke as hindrances to physical activity initiation and adherence (Benjamin et al., 2014; Chen, 2010). In a qualitative study by Chen (2010), 90 older adults were

interviewed regarding their perceived barriers to physical activity in a RCFE setting, with the most frequently mentioned barrier being limitations due to poor health status. Moreover, in a population-based study by Lim and Taylor (2005), a survey focused on physical activity behaviours was administered to 8881 older adults. After analysis of the surveys, the researchers concluded that health problems are the most reported barrier to physical activity for older adults. In sum, the declining health status of older adult citizens caused by increasing age and negative adjustments to relocation create a significant barrier that makes it overly difficult to initiate and adhere to physical activity.

As age increases, older adults become increasingly likely to experience physical pain due to negative outcomes associated with aging (Blyth, March, Brnabic, Jorm, Williamson, & Cousins, 2001; Ross & Crook, 1998). The chronic pain experienced by older adults is often exacerbated after relocation to a RCFE, which acts to further decrease their quality of life (Ferrell, 1995; Fox, Raina, & Jadad, 1999). When older adults experience chronic pain they often perceive that they are physically incapable of exercise (Schutzer & Graves, 2004). More specifically, older adults often claim that when they exert themselves, it places too great of strain on their fragile bodies. Instead of viewing physical activity as a solution, it is viewed as a trigger for pain onset and older adults often fear it will perpetuate existing symptoms (Booth et al., 2000; Cohen-Mansfield et al., 2003). In a study by Brenner and Marsella (2008), 12 RCFE-dwelling residents aged 74-95 completed a survey regarding factors that influence their physical activity adherence. After data analysis, the researchers concluded that chronic pain was a major barrier to older adults' initiation and adherence to physical activity. In addition, through his research, Chen (2010) identified that the fear of falling and resulting chance of injury and additional pain were main barriers to physical activity. Older adults often report that they are

concerned physical activity is too ‘risky’ for them due to their limited balance and vision (Chen, 2010; Phillips & Flesner, 2013). Overall, the perception of pain and the fear of intensifying this pain through physical activity is considered a major barrier that often prevents older adults from initiating and adhering to physical activity (Benjamin et al., 2014; Brenner & Marsella, 2008; Chen, 2010).

Inadequate Physical Activity Programming. It is well known that healthcare providers working in RCFEs plan and schedule physical activity interventions for older adults. The Canadian Centre for Activity and Aging asked 82 long-term care facilities, based in 9 different provinces, to complete a survey based on the amount of physical activity programming provided. This survey found that 98% of long-term care facilities in Canada provide exercise and physical activity programs (Shanti et al., 2005). Although healthcare providers facilitate physical activity interventions, the type and delivery of these programs often act as a barrier to participation (Benjamin et al., 2009; Chen, 2010; Kalinowski et al., 2012). In a literature review of 22 articles, it is reported that some residents living in RCFEs believe that “exercise classes were not challenging enough, described the classes as boring, or expressed fear that they would not be able to ‘keep up’ with their peers” (Benjamin et al., 2014, p. 159). This is the case because residents in RCFEs present a wide range of functionality and admit that they are seldomly consulted by physical activity programmers (Chen, 2010). Moreover, in Chen’s (2010) qualitative study, RCFE residents explained that they were uninterested in physical activity because the healthcare workers planning and leading these programs did not provide them education on the benefits of physical activity. In a similar qualitative study, 31 adults over the age of 60 suggested that exercise planned by healthcare workers was not meaningful to them and did not meet their individual needs. As a result, they did not adhere to these programs or

participate in any other planned physical activities (Costello et al., 2011). Considering these barriers in combination, it can be concluded that not including RCFE residents in the planning of their physical activity interventions acts as a significant barrier. Because these interventions are not individualized and catered to the needs of residents, they have difficulty with initiation and adherence.

Nintendo Wii Exergame Physical Activity Interventions

In today's society, much emphasis is placed on innovative technology and its ability to support non-pharmacological interventions targeting health improvement (Braun, Kleynen, Bleijlevens, Moser, Beurskens, & Lexis, 2015). Exergames are an emerging trend in healthcare and are becoming a very popular tool to increase physical activity in long-term settings (Chao et al., 2015). The Nintendo Wii is a very popular exergaming console due to its numerous interactive features that allow the user to have a fun and enjoyable experience while exercising. To play the Nintendo Wii, the user must hold a Wii Remote in one hand. The Wii Remote includes an attachable wrist strap that players can utilize to ensure they do not inadvertently throw or drop the remote during gameplay. The Wii remote has a variety of buttons on its outer shell that can be used for some aspects of gameplay; however, gameplay relies mainly on physical manipulation of the Wii Remote. For example, the user is required to hit the 'A' button to begin a game, but then must physically move the Wii Remote to play the game.

Motivational Features of Nintendo Wii. The Wii Remote is embedded with sensors that respond to changes in direction, speed, and acceleration (Chao et al., 2015), which allow the user to be represented in a virtual environment as an avatar. Seeing oneself on screen is considered very engaging and motivational because the user is continuously provided with visual feedback of real-life movements (Chao et al., 2015). During gameplay the user is also provided

with motivational audio feedback in the form of encouraging commentaries and music (Chao et al., 2015). Furthermore, the Nintendo Wii keeps track of how well an individual performs during gameplay, which provides users with additional motivation to beat their own records or those of others. Overall, in a literature review of 22 empirical studies focused on the effects of using the Nintendo Wii with older adults, Chao et al. (2015) found that all exergame interventions yielded high attendance rates, proving that the motivational properties of the Nintendo Wii lead to physical activity initiation and adherence

Although exergames are a promising health promotion strategy, they are largely targeted toward the younger generation (Kato, 2010). Despite the fact that most exergames are not designed with elderly individuals in mind, health care workers have introduced and utilized exergames in senior centers and retirement communities (Rosenberg et al., 2010). It may be argued that older adults have little interest in new technology (Mitzner et al., 2010), such as exergaming consoles; however, research shows that older adults are interested in keeping up with technology and playing the Nintendo Wii because of the potential for physical and psychosocial health benefits (Shubert, 2010; Kahlbaugh et al., 2011). When older adults are introduced to the Nintendo Wii, it is possible that they will experience great confusion and be unable to play the exergame. Rosenberg et al. (2010) disproves this notion and states that Nintendo Wii gameplay actually yields high satisfaction among elderly individuals. In his qualitative study, Rosenberg et al. (2010) focused on 16 participants aged 63 – 94 with subsyndromal depression. He led participants through a 12-week exergame intervention and discovered the following through interviews:

Some participants started out somewhat nervous about how they would perform in these games and understand the technical aspects of game play. However, by the end of the

study, most participants reported that learning and playing the Wii were ‘satisfying,’ they enjoyed the fact that the games were ‘fun and varied’ and ‘challenged me to do better,’ and they ‘saw progress. (p. 224)

Although the Nintendo Wii is geared toward the younger generation, this exergaming console has numerous features that appeal to older adults. First of all, the Nintendo Wii provides older adults with a way to participate in activities that they enjoyed earlier in life; yet, are no longer capable of performing. For example, an older adult who was once an avid golfer, but is no longer able to swing a golf club, is provided the opportunity to use the Wii Remote as a club to play a virtual game of golf. Kahlbaugh et al. (2011) argue that when older adults utilize the Nintendo Wii to participate in activities they once enjoyed, they experience benefits that are superior to simplistic activities that are often performed in RCFEs, such as walking or creating arts and crafts. Through playing the Nintendo Wii and experiencing a plethora of virtual games and activities that were once enjoyed, older adults may develop an interest in becoming more physically active and participating in increased activities around the RCFE they dwell in (Kahlbaugh et al., 2011). Furthermore, because hundreds of games are available for the Nintendo Wii, players have numerous choices in what activity they want to participate in. This may not only increase enjoyment and motivation for play, but it will also allow older adults to create a personalized physical activity intervention (Rosenberg et al., 2010).

The Nintendo Wii can be played while the user is standing or sitting (Agmon et al., 2011) and most games require only small movements of the upper extremities (Hsu et al., 2011), allowing even the most physically compromised individuals to play. In addition, the Nintendo Wii provides a safe outlet for elderly individuals to participate in physical activity. To date there are no studies available that report an adverse event or an older adult being injured during

Nintendo Wii game play (Chao et al., 2015; Skjæret, Nawaz, Morat, Schoene, Helbostad, & Vereijken, 2016). In sum, the Nintendo Wii is relevant to older adults and it holds the potential to motivate this demographic to initiate and adhere to physical activity.

Physical Health Benefits Associated with Nintendo Wii. The Nintendo Wii has proven successful as an independent therapy for stroke survivors to improve physical function. In a study by Mouawad et al. (2011), seven participants ranging from 1-38 months post-stroke and ranging in age from 42-83 were recruited. These individuals participated in 10, one-hour sessions of Nintendo Wii play, with all participants demonstrating improvements in functional ability, range of motion, and spasticity of their upper limbs. The Nintendo Wii has also been used as an independent therapy to increase fine-motor control in an older adult following a stroke (Drexler, 2009). In addition, the Nintendo Wii has been utilized to supplement common exercise and physiotherapy programs for compromised patients. Research shows that when stroke patients play the Nintendo Wii in addition to their normal physiotherapy, the functionality of their arms, muscle power, and grip strength are all improved (Joo et al., 2010; Saposnik et al., 2010). Moreover, long-term care residents struggling with upper extremity discomfort identify that exergame play in addition to their normal exercise routine decreased the pain, weakness, and stiffness in their upper extremities (Hsu et al., 2011).

Participation in a Nintendo Wii exercise intervention has promoted increases in older adults' maximal leg strength (maximal voluntary contraction and rate of force development; Jorgensen et al., 2013). This increased leg strength may be a plausible explanation as to why older adults who fear falling, display improved balance confidence (Bainbridge et al., 2011; Rendon et al., 2012) and a significantly reduced fear of falling after a Nintendo Wii exercise program (Jorgensen et al., 2013). Moreover, after a Nintendo Wii exercise intervention: stroke

survivors have displayed improved balance (Mouawad et al., 2011); older adults suffering from chronic obstructive pulmonary disease (COPD) have displayed improvements in walking endurance and the number of sit-to-stand repetitions performed in 30 seconds (Albores et al., 2013); older adults with Parkinson's disease have improved static and dynamic balance, mobility, and functionality (Esculier et al., 2012); older adults in an acute geriatric rehabilitation unit have displayed improved balance and functional mobility (Laver et al., 2012); older adults residing in different types of retirement homes demonstrate significant improvements in walking speed and balance (Agmon et al., 2011; Franco et al., 2012; Rendon et al., 2012; Williams et al., 2011). Furthermore, in a study by Chao et al. (2013) it was discovered that older adults residing in a RCFE facility experience improvements in balance after participating in a Nintendo Wii exercise intervention. In this study, 7 RCFE-dwelling older adults aged 80-94, participated twice a week, in an 8 week Nintendo Wii exercise intervention. In addition to the balance improvements, although not statistically significant, the researchers concluded that this intervention improved participant mobility, walking endurance, and decreased the fear of falling. Overall, these studies highlight that a Nintendo Wii exercise intervention can confidently be utilized to promote physical health benefits in the senior demographic.

Mental Health Benefits Associated with Nintendo Wii. Although there is limited research in this area, the Nintendo Wii has been successfully utilized as an exercise intervention to improve the mental health levels of the elderly population. In a study by Li et al. (2016), the researchers set out to examine the antidepressant effect that the Nintendo Wii had on older adults. After leading 49 depressed older adults through a 6-week intervention, the researchers noted that this program improved participants' depressive symptoms, positive emotions, and self-efficacy. Moreover, in a qualitative study by Rosenberg et al. (2010), the researchers led 16

elderly participants with subsyndromal depression, through a 12-week Nintendo Wii exercise program. After participating in three, 35-minute sessions per week, the researchers noted improvements in mental-health related quality of life, specifically in the form of decreases in depression and anxiety levels. Due to the lack of research in this area, the researchers deem exergames as a novel route to improve symptoms of depression and anxiety in older adults.

Following a 6-week Nintendo Wii exercise intervention, community-dwelling older women have identified improved psychological well-being, specifically in the form of positive changes in self-perception (Wollersheim et al., 2010). Furthermore, after a 12-week intervention, using the Xbox Kinect as the exergaming console, older adults reported psychological benefits in the form of improved self-esteem, mood, and reasoning (Meneghini, Barbosa, deMello, Bonetti, & Guimaraes, 2016). Although this study utilizes the Xbox Kinect for the exergame intervention, it is assumed that a Nintendo Wii intervention will elicit the same results. This assumption can be made because research shows that there is a positive relationship between physical activity and the mood of older adults (Kahlbaugh et al., 2011). In a study by Kahlbaugh et al. (2011), 28 older adults with a mean age of 82 were randomly assigned to a Nintendo Wii exercise group or a television-watching group. In their grouping, participants were paired with a partner to either watch television or play the Nintendo Wii game, 'Wii Bowling' for one hour per week. After 10 weeks the participants in the Nintendo Wii exercise group exhibited a significantly improved mood compared to the television-watching group. In addition, another study found that after participating in the Nintendo Wii game, 'Wii Fit,' for 12 weeks, older adults suffering from COPD displayed significant improvements in emotion (Albores et al., 2013). Assessing these studies in combination prove that psychological health as the potential to be improved through the use of Nintendo Wii exergame exercise programs.

Social Functioning Benefits Associated with Nintendo Wii. To combat the decline in psychosocial competence that comes with aging, research has acknowledged that participating in simulated, embodied games, such as the Nintendo Wii, provides an outlet for social engagement (Agmon et al., 2011; Chao et al., 2015; Esculier et al., 2012; Kahlbaugh et al., 2011). When older adults participate in a Nintendo Wii exercise program with a partner, this shared interest provides an outlet for a relationship to develop amongst partners. Through the research by Kahlbaugh et al. (2011), it was found that participating older adults in the Nintendo Wii exercise group experienced a large decrease in loneliness compared with the television-watching group. The authors provided the plausible explanation that, “participating in the Wii study created a common social network and a group identification in their senior apartment setting that increased a sense of place and relevance for them” (Kahlbaugh et al., 2011, p. 340). In addition, research by Jung, Koay, Ng, Wong, and Kwan (2009) yielded similar results. In this study, the researchers went to a senior citizens long-term care facility in Singapore to recruit 45 participants between the ages of 56 and 92. Participants were randomly assigned to a group that either played the Nintendo Wii or traditional board games for 6 weeks. After the intervention the researchers concluded that playing the Nintendo Wii improves the social well-being of participants to a much greater extent than playing traditional board games does.

In addition to Nintendo Wii exercise interventions providing an outlet for social interaction among RCFE residents, research highlights that these exergames also promote connectedness with family members, especially grandchildren (Agmon et al., 2011; Chao et al., 2015). In a qualitative study by Chao et al. (2015), 15 RCFE-dwelling individuals with a mean age of 87 were recruited. Subjects were required to participate in a Nintendo Wii exergaming program twice a week for four weeks and were interviewed after. Researchers found that this

program significantly improved resident perceptions of social functioning and decreased the generation gap between the elderly participants and younger generation which lead to improved relationships with family members. Participants explained that becoming more technologically advanced allowed for a greater connection with younger family members, especially grandchildren. One participant explained that, “it makes me realize how out of touch I am with this generation because I haven’t adapted to the computer . . . I was glad I was able to join my grandson’s conversation about the Wii games” (p. 6). Overall, these findings support the notion that increased social interaction through participation in Nintendo Wii exergames lead to improved social functioning and decreased loneliness in RCFE-dwelling older adults.

Acceptance and Commitment Therapy

ACT is an evidence-based therapy that utilizes mindfulness and acceptance techniques to improve one’s perceptions of life worth. This therapy challenges the goals of Western psychology, as its focus is not on reducing or eliminating negative symptoms, but rather “creat[ing] a rich and meaningful life, while accepting the pain that inevitably goes with it” (Harris, 2006, p. 2). After its inception in the 1980s, ACT has been successfully utilized to treat a variety of diverse populations (Roberts & Sedley, 2016) who have exhibited a wide range of pathologies including depression, anxiety, OCD, chronic pain, workplace stress, PTSD, anorexia, and schizophrenia (Harris, 2006). ACT was created by Steven Hayes and is based on human language (Hayes, 2004). More specifically, language, in the form of words, images, sounds, facial expressions, and physical gestures is central to normal human life because it goes hand-in-hand with our lived experiences. Whether it is public language in the form of talking and expressive arts (i.e., dancing, gestures, and painting) or private language in the form of thinking, imagining, planning, analyzing, and fantasizing, it guides our interaction with the world.

Language can be positive in that it helps us organize our experiences, predict and plan for the future, learn and imagine things that have never existed, communicate with others, share knowledge, and learn from people who are no longer alive. However, it can also be negative in that it allows us to re-live painful events from the past, scare ourselves with imagined futures, compare, criticize, judge, and condemn ourselves and others, and helps us to create rules for ourselves and the way we live that may help or hinder our happiness (Harris, 2009).

Psychological Inflexibility. When individuals struggle with negative, private language and believe it is reality, it often leads to psychopathology and resulting symptoms. Creators of the ACT model have coined the term ‘psychological inflexibility’ to explain this phenomenon and define it as “an inability to connect with one’s values in the present moment due to experiential avoidance and cognitive fusion” (Hayes, Strosahl, & Wilson, 1999). Experiential avoidance refers to an unwillingness to be in contact with private, negative language and personal attempts to control, silence, and rid this language. Individuals experiencing experiential avoidance often conceptualize this negative language as too painful to handle and will do everything they can to ensure it fades as quickly as it emerged. When experiential avoidance is achieved, individuals are provided with relief from their painful language, which increases the probability that this behaviour will continually arise. This is considered a form of negative reinforcement and, although it is helpful to rid negative language in the present moment, it can be very harmful in the long term, due to the avoidance of life experiences (Robertson & Hopko, 2009). Moreover, cognitive fusion refers to attaching truth and becoming entangled in negative, private language to the point that one loses touch with the present moment. Becoming entangled with a thought influences one to place full attention on this thought, which consequently leads to decision making based on internal experience rather than what is actually occurring in the real

world. Individuals experiencing cognitive fusion believe that their thoughts are the absolute truth and will allow these thoughts to influence their behaviour, even if doing so negatively affects their life (Harris, 2009). In a state of cognitive fusion an individual will allow thoughts about an event to elicit the same reaction as the event itself, which will lead to behaviours based on a thought being true (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). For example, the thought of ‘being in too much pain to get out of bed’ will have a large impact on an individual’s behaviour and they will stay in bed to avoid their imagined pain even if they are fully capable of getting up. In sum, experiential avoidance and cognitive fusion cause one to lose contact with the present moment and behave in a way that is incompatible with personal values, which consequently promotes the development of psychological inflexibility.

Experiential avoidance and cognitive fusion often occur concurrently to promote psychological inflexibility (Harris, 2009). The following example will demonstrate this connection: when healthcare workers task an older individual with initiating physical activity, this individual will often give numerous reasons as to why they should not participate (i.e., “I’m too old”; “I’m in too much pain”; “My body cannot handle physical activity”; and, “I don’t care if physical activity is good for me, I don’t like it”). This individual will cognitively fuse to these negative thoughts and may even imagine times in the past when they had a negative experience while participating in physical activity. During this cognitive fusion, the older adult will develop additional negative feelings, such as anxiety, regarding their potential participation in physical activity, which will further intensify their unwillingness to participate. If a healthcare worker continually tries to encourage participation and is adamant that the older adult participates, these negative feelings will continually occur and potentially intensify. However, the moment that the healthcare worker stops pushing for physical activity initiation and leaves the room, all of the

older adults' negative thoughts will disappear. Consequently, the older adults' negative feelings and behaviour will be reinforced; negative reinforcement will increase the chance of these feelings arising during similar situations in the future, which will further decrease the chance of physical activity initiation.

ACT with Older Adults. Research has provided insight into how the phenomenon of psychological inflexibility prevails at any point in life, even in older adults who are considered wise due to their extensive life experiences. Psychological inflexibility has been linked to older adults in such a way that it creates a decreased sense of meaning in life (Krause, 2007), increased depression (Andrew & Dulin, 2007), continual anxiety (Ayers, Petkus, Liu, Patterson, & Wetherell, 2010), chronic pain (Wicksell, Renofalt, Olsson, Bond, & Melin, 2008), panic (Eifert & Heffner, 2003), poorer results for depression interventions (Rosenthal, Cheavens, Compton, Thorp, & Lynch, 2005), increased suicidal thoughts (Cukrowicz et al., 2008), limited psychosocial ability and high emotional responsiveness (Hayes et al., 2004); and, an overall increase in emotional distress (Petkus & Wetherell, 2013; Robertson & Hopko, 2009). Research by Roberts and Sedley (2016) into the case of an 89-year-old woman with clinical depression and generalized anxiety disorder concluded that psychological inflexibility and experiential avoidance were reduced after a brief ACT intervention; consequently, her anxiety and depression were reduced to non-clinical levels. Results from another study conducted by Wetherell et al. (2011) on 21 adults over the age of 60 also concluded that ACT is advantageous to use with the elderly population. In sum, the presented research suggests that ACT is an adequate and auspicious form of therapy to utilize with older adults while attempting to promote psychological flexibility and initiate engagement in physical activity.

The aforementioned study by Roberts and Sedley (2016) is a valuable study on the application of ACT in older adults because it is one of the first studies to highlight concrete reasoning behind its effectiveness. As previously mentioned, as older adults age, they are likely to experience a variety of stressors that often result in a range of physical and psychological challenges. Attempting to explain these issues to healthcare providers may be an extremely daunting task for older adults due to their limited ability to communicate specifically how and what they are feeling. This lack of communication may make it extremely difficult for traditional therapists to determine what has caused the psychopathology and what it actually is; resulting in the less than ideal to prescription and treatment plan. The trans-diagnostic nature of ACT and its independence on a specific prognosis to operate, provides insight that it is an ideal therapy for older adults (Petkus & Wetherell, 2013). Furthermore, the collaborative nature of the ACT therapeutic relationship is ideal for working with older adults. In this relationship, the therapist demonstrates the qualities of compassion, acceptance, empathy, and respect (Harris, 2006) rather than inferring or saying, "This is what I think is wrong with you and this is how we are going to fix it." Showing respect for older adults' life-long experiences and resulting wisdom is a necessary feature when attempting to support positive aging and promote adherence to the therapy (Laidlaw, 2006). In sum, this evidence provides strong reasoning as to why ACT will be an effective approach to elicit a behaviour change in older adults.

There are very few academic publications on utilizing ACT with older adults, which suggests that this may be a rare therapeutic approach for this population. Although prior research highlights that many older adults prefer counseling to treat their psychopathologies, oftentimes they are treated pharmacologically (Gum, Iser, & Petkus, 2010). This is the case because older adults and therapists often contribute pathology to increasing age and a majority of older adults

do not feel the need to seek these services (Klap, Unroe, & Unutzer, 2003; Smyer & Qualls, 1999). This lack of mental health awareness in older adults provides insight that they may not understand the purpose of traditional Western therapy focused on removing negative symptoms associated with psychopathology. ACT may be more plausible for the senior demographic because it focuses on living a value-based life, which is something that they should understand (Petkus & Wetherell, 2013). Further, a therapy based on acceptance and values is much more beneficial for older adults than an approach where they attempt to modify their language about pathology and the resulting symptoms because they are often unable to do so (Petkus & Wetherell, 2013).

Psychological Flexibility. The term psychological flexibility is a “buzzword” in the ACT community and may be understood by discerning that it is the exact opposite of psychological inflexibility. Psychological flexibility is defined as, “the ability to be in the present moment with full awareness and openness to our experience, and to take action guided by our values” (Harris, 2009, p. 12). Overall, psychological flexibility is the overarching goal of ACT and there are six core processes that work in combination towards its achievement. For the purpose of this literature review, the components of ‘acceptance,’ ‘mindfulness,’ and ‘values-based action’ will be discussed. Resiliency is promoted through ACT’s core components and, if it can be developed in older adults, it is assumed they will be prepared to overcome their resistance to physical activity and be more motivated to initiate participation. The plausibility of ACT for older adults living in RCFEs is supported by evidence that the principles of ACT directly combat the development of psychopathology and promote increased engagement in physical activity.

Acceptance. To limit experiential avoidance, ACT utilizes the component of ‘acceptance’. ‘Acceptance’ involves allowing internal language to come naturally and be present

in the body, regardless of its positive or negative nature. Dropping the struggle with internal language and developing openness for it will provide one with more personal resources to focus on what is meaningful. Instead of struggling with thoughts and feelings that are inherent to human nature, one will now be more capable of focusing their time, energy, and effort on values-based action (Hayes, Pistorello, & Levin, 2012). It is important to understand that ‘acceptance’ is not tolerating or even liking internal language, but rather developing a willingness to accept this language as it is. As an ACT therapist, rather than using the word ‘acceptance’, it may be beneficial to use the word ‘expansion’ to ensure the client understands that this component is focused on creating space in the body for negative language rather than actually accepting that it is true. If expansion occurs in the body, negative language will have somewhere to go when it appears and consequently the mind will be open and free to take action toward personal values.

As an ACT therapist attempting to promote ‘acceptance’, it is very important to ensure that your client does not accept every thought and feeling that arises. ‘Acceptance’ should only be fostered when it empowers one to act on their personal values in attempt to improve their life as much as possible. To accomplish this as an ACT therapist, ‘The Pushing Against the Clipboard Metaphor’ can be used (Harris, 2009). For example, when attempting to motivate an older adult to initiate engagement in physical activity, the therapist can look for an excuse as to why they do not want to participate (i.e., “I feel that I am too old and in too much pain to be physically active”). The therapist can then have the client imagine this negative language as a clipboard; hence, the clipboard metaphor. The therapist then asks the client to struggle with and try to push away the clipboard, in attempt to remove negative language and develop a readiness to participate in physical activity. When the client is pushing on the clipboard the therapist will apply pressure to the other side of the clipboard, resembling the internal struggle to remove this

negative language. While pushing, the therapist can state the following, “you’re pushing and pushing and pushing, and it’s taking up all your time and energy. Your shoulders are tired, and you’re hemmed in, and you can’t do anything useful like [participate in physical activity so you are able to develop the endurance to play with your grandchildren]” (Harris, 2009, p. 136). After this statement the therapist can set the clipboard on the client’s lap and state, “how’s that? Isn’t that a lot less effort? [...] Yes, the clipboard is still there, in fact, it’s even closer to you than before. But notice the difference: now you’re free to do the things that make your life work. You can [engage in physical activity to develop the necessary endurance to play with your grandchildren. Your negative language is] not draining you, tiring you, tying you up, closing you off. Isn’t that easier than [struggling to push the clipboard away?] Now suppose you learned how to do this with your feelings instead of fighting with them or organizing your life around trying to avoid them. [Can you see how] this might benefit you?” (Harris, 2009, p. 136). If the client can indeed see the benefit and learns to make room for negative language, this signals that ‘acceptance’ has been fostered. In sum, Russ Harris, a major ACT therapist trainer, perfectly captures the essence of ‘acceptance’ when he states that it involves, “mak[ing] full, open undefended contact with unwanted private experiences [w]hen experiential avoidance becomes a barrier to values-congruent action” (Harris, 2009, p. 134).

Teaching older adults to accept distress rather than try to fix it and then attempt to live a value-based life aligns impeccably with the developmental changes in older age (Roberts & Sedley, 2016). Promoting acceptance in older adults should act to limit the effect that an excuse has on the client, and in turn, promote a readiness and willingness to participate in physical activity, in attempt to achieve what is personally valuable.

Contact with the Present Moment. Mindfulness is defined as “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 1994, p. 4). The ACT component of ‘contact with the present moment’ is inherent in mindfulness and plays a very important role when attempting to promote both cognitive defusion and acceptance. This is the case because one must notice and pay attention to thoughts and feelings in order to defuse from or accept them (Harris, 2009). ‘Contact with the present moment’ means being in the here and now and flexibly paying attention to our experience with openness and curiosity, rather than placing all focus on our internal language (Harris, 2009). According to Harris (2009), the aim of contacting the present moment is to:

Enhance conscious awareness of our experience in the present moment, so we can perceive accurately what’s happening, and gather important information about whether to change or persist in behaviour. To engage fully in whatever we’re doing for increased effectiveness and fulfillment. (p. 156)

Although life occurs only in the present, attention is often focused on the past and imagined future (Hayes et al., 2012). Placing attention on the past and future is harmful to human existence as it often leaves one to act mindlessly and become disconnected with the here and now experience (Harris, 2009). However, when one can ‘contact the present moment’ one is more capable of living a life focused on values, which consequently promotes a more rich, full, and meaningful life (Harris, 2009). ‘Contacting the present moment’ is necessary for self-awareness and self-knowledge because it increases acknowledgement of thoughts and feelings in the present moment. When increased focus is placed on these thoughts and feelings, one is more capable of making choices and behaving in a way that aligns with her personal values (Harris, 2009). ‘Contacting the present moment’ also allows for one to take effective action as behaviour

is based on what is occurring in the present and what one is currently doing, not on the past or imagined future (Harris, 2009).

The aforementioned reasoning highlights how important and necessary this component of ACT is when attempting to motivate older adults to initiate participation in physical activity and social engagement. Rejeski (2008) further supports the importance of ‘contacting the present moment’ for older adults when he states, “a mindfulness perspective can benefit the promotion of physical activities and a new relationship with the body in aging, Likewise, physical activities in the context of aging provide an ideal means of developing mindfulness in day-to-day life” (p. 139). If older adults can ‘contact the present moment’ and use these new mindfulness skills to become physically active, physical activity participation will provide additional mindfulness benefits, which will further improve ones’ quality of life. It is simple to conclude that ‘contacting the present moment’ will allow one to identify what is actually occurring at any given moment, so they are able to act effectively and live a richer and more fulfilling life. For example, when an elderly individual is tasked with initiating physical activity, he is often overwhelmed with anxiety. If able to live in the present moment and feel how this anxiety is affecting him, he will be more capable of letting it go, which will enable him to act more effectively (Brach, 2003; Young, 2004).

Values-Based Action. Values-based action is the action taken by an individual in order to live a rich, full, and meaningful life. Therefore, values are principles that help guide and motivate individuals to live meaningfully throughout life. Harris (2009) defines values as:

Our heart’s deepest desires for the way we want to interact with the world, other people, and ourselves. They’re what we want to stand for in life, how we want to behave, what

sort of person we want to be, what sort of strengths and qualities we want to develop. (p. 191)

Overall, values give direction to an individuals' life and are personal aspirations for how one would like to live life; values identify what one strives to exemplify (Harris, 2009). ACT therapists may find it difficult to explain and have clients grasp the meaning of values because clients often confuse values and goals (Harris, 2009). For example, when asking a client about values, he or she may respond with goals such as the ideal partner, occupation, or body he or she desires, or something such as finding friendship. In order to effectively develop values that are rooted in these goals, Harris (2009) suggests that an ACT therapist ask, "if this goal were achieved: what would you do differently? How would you act differently? How would you behave differently in your relationships, work life, social life? What would it show you stand for?" (p. 204). A good example highlighting the contrast between values and goals is the difference between 'getting married' and 'being loving.' Being loving is a value because it is ongoing and at any point in time one can choose to act on or neglect this value. In contrast, getting married is a goal because it can be completed or achieved; one can still achieve this goal even if he or she disregards the value of being loving (Hayes et al. 1999). In sum, values occur in the present moment; at any point in time one can choose to act on or neglect their values, whereas goals are in the future. If a therapist can help a client discern values from goals, the client will be in a position to use these values to guide and motivate ongoing action that will consequently help them move closer to achieving their goals (Harris, 2009).

An assumption of ACT is that detrimental, negative behaviour is not motivated by values (Harris, 2009). Therefore, in order to facilitate acceptance and motivate effective action in unmotivated individuals, ACT suggests developing values-based action as a precursor to goal

setting. This can be achieved by facilitating a deep, intimate, and experiential conversation focused on values (Harris, 2009). More specifically, ACT can begin with a focus on values and the therapist can ask questions such as: “deep down inside, what’s important to you? What do you want to stand for in life? What sort of personal strengths and qualities do you want to cultivate? How do you want to behave in your relationships?” (Harris, 2009, p. 192). In certain situations, clients may refuse to discuss values that can provide insight into whether the client understands what values are, is in contact with his or her values, or experiences experiential avoidance of those values. For example, when discussing values, the client may state: “I don’t have any values; I don’t know; my values don’t matter; I don’t see the point of this.” If this situation occurs, the ACT therapist must take a step back and begin focusing on cognitive defusion and acceptance; or, doing work with the client so they understand their values (Harris, 2009). Once the client has grasped and understood values, the ACT therapist can proceed into exploration of the client’s values. Throughout this exploration the therapist must foster a sense of openness, vitality, and freedom so the client is in the best position possible to truly connect with his or her values. If this is achieved, the client will realize that she has choices, which will allow her to progress her life in a richer and a more meaningful and complete direction.

Older adults who seek care in RCFEs are often in or nearing the final stages of their lives and it is believed they understand that their death is approaching. Older adults have acknowledged that during their assumed last years of life, they place effort in engaging in meaningful activities and are less likely to spend time on tasks that are meaningless to them (Schaie, 2008). Roberts and Sedley’s (2016) research showed that ACT’s focus on value identification and committed action toward value-based goals is very meaningful and something

these older adults strive for, which likely renders this a reasonable therapy to promote older adults' engagement in physical activity and social functioning opportunities.

Chapter 3 – Methodology

Research Design

Case Study Approach. To improve knowledge on the potential value of the intervention featured in this study in order to improve it for use with RCFE-dwelling older adults, a case study research approach was implemented. According to Savin-Baden and Major (2013), when utilizing a case study approach, researchers should focus on a specific ‘case’, such as an organization, program, village, family, or even an individual. This ‘case’ should also be bounded so research can place singular focus on a specific phenomenon. The specificity of a case study approach enables the researcher to analyze and develop themes from the collected data (Merriam, 2009). More specifically, the researcher is able to place focus on a bounded system in order to develop new insights from a specific event; the holistic and meaningful characteristics of a phenomenon are explored and understood (Yin, 2009). As previously implied, this research focuses on men and women living in the same RCFE in Southwestern Ontario, whom exhibit similar limitations in physical (e.g., physical activity programs) and psychosocial (e.g., social engagement) activities. These respective individuals will participate in an eight-week Nintendo Wii physical activity intervention in combination with ACT, outlining how this research fits the description of a case study; it is focused on a similar set of individuals, participating in a solitary event, in a distinct organization.

Savin-Baden and Major (2013) present six different types of case studies; namely, exploratory, descriptive, instrumental, interpretive, explanatory, and evaluative. My research is considered evaluative in nature because, rather than describing the case, it has judged the merit of the phenomenon under study. More specifically, this research has enabled judgment of the capability of an eight-week Nintendo Wii physical activity intervention in combination with ACT to motivate participants to become more engaged in a physical activity program.

Concurrently, this research has enabled the researcher to judge aspects of the program that may affect participants' willingness to participate in available programs at their residence; and, has determined if the intervention contributes to changes in participants' perceptions of their physical health, mental health, and social functioning. Overall, this evaluative case study has helped explain RCFE-dwelling older adults' experiences with an eight-week Nintendo Wii physical activity program in combination with ACT and has improved knowledge on the potential value of such interventions for residents in RCFE facilities.

Pragmatic Philosophical Paradigm. When conducting qualitative research, researchers should develop and explicitly express a philosophical stance in the attempt to make their assumptions known to themselves and viewers of their study (Savin-Baden & Major, 2013). This is important because researchers' assumptions significantly affect how their research is designed, their behaviour while conducting the research, and consequently, what will be discovered (Savin-Baden & Major, 2013). A philosophical stance is defined by Savin-Baden and Major (2013) as "a philosophically informed view about reality, knowledge and ways to gain knowledge that serves as a guide for a particular study; it is a guiding perspective about the nature of truth and human behaviour and thus is the very foundation for research" (p. 54). Although a philosophical stance is based on the researchers' views regarding ontology, epistemology, and ideology, Savin-Baden & Major (2013) state that:

Pragmatism does not require adherence to a particular philosophical position about the nature of reality and knowledge, but instead implies that a researcher will take a practical view when attempting to problem solve and to link theory and practice through the research process. (p. 38)

The practical view that pragmatists adopt when conducting research allows the selection of the most appropriate methods to best answer the research question, without loyalty to a specific research approach (Savin-Baden & Major, 2013). For the purpose of this research, purposively selecting participants with characteristics that are most likely to be positively affected by the intervention, has provided me with the highest quality data to answer the research question. In addition, pragmatically collecting data through interviews and observation has provided me with the best understanding of RCFE-dwelling older adults' experiences with ACT in combination with a Nintendo Wii-based physical activity program. This is the case because observing participants and collecting field notes throughout this intervention has allowed me to better understand the context of this intervention; whereas, conducting interviews has enabled me to have a face-to-face conversation with individuals so they can discuss their experiences in depth after participating in eight weeks of this intervention. Moreover, pragmatists maintain that research should be conducted in a natural context and focused on understanding people and situations rather than measuring observably defined facts (Savin-Baden & Major, 2013). This aligns with the case study approach because this research was bounded and only focused on situations that were useful to answer the research questions. More specifically, this research was carried out in the natural context of the RCFE home that participants reside in and only data regarding participation in the intervention was collected. Overall, my pragmatic philosophical stance allowed me to understand how RCFE residents are affected by ACT in combination with a Nintendo Wii-based physical activity program, thereby, adequately answering the research questions.

Constructivist Philosophical Paradigm. Although I hold a pragmatic philosophical stance and have used this orientation to design my study, I also brought somewhat of a

constructivist approach to this research. “Constructivists generally do not begin with a theory but instead generate or inductively develop a theory or pattern of meanings through the research process” (Savin-Baden & Major, 2013, p. 63). This research did not begin with theory; the particularity in my sample has added a dimension of knowledge in this field and I did not ignore any data that my participants gave me. When my sample provided me with overarching themes that were not related to the research questions, I did not ignore them. I ensured these themes were noted and searched through all data to determine if similar themes emerged. This allowed me to inductively develop new knowledge and add to existing theory on this topic. This aligns with the constructivist philosophical stance because I, the researcher, constructed knowledge through the collected data. Overall, designing my study with a blend of pragmatism and constructivism provided the greatest understanding of outcomes associated with ACT in combination with a Nintendo Wii-based physical activity program.

Procedures and Sample

Gaining Access. To begin my search for an ideal location for conducting this study, I used the Internet to research many different RCFEs in Southwestern Ontario in order to determine the recreation and leisure programming provided at each facility. Initially, I attempted to target RCFEs that did not provide recreation and leisure programming for residents because I assumed that residents living in such facilities would be more sedentary and socially isolated than residents in facilities that provided ample programming. Targeting residents with these characteristics was ideal because the intervention in this research is intended to improve the physical and psychosocial health of participants. Thus, it was assumed the intervention would have the greatest effect on residents at these locations, which would provide the highest quality results for this study. Since all RCFEs I researched provided residents with numerous recreation

and leisure activities, I removed a lack of recreation and leisure programming from the selection criteria and attempted to target RCFEs with over 75 residents. I focused on highly populated RCFEs in hope that I could sufficiently locate sedentary and socially isolated residents within this large population to act as my research participants. After doing more research, I narrowed my search down to five RCFEs and contacted them through e-mail to see if they would be interested in allowing me to conduct research at their facility. I received two replies from the managers of different facilities, with only one expressing their interest in my research and setting up an in-person meeting with me. After a lengthy meeting regarding my research with two managers and two recreation therapists, they agreed to host my research at their site.

The host site for this research is a 100 bed RCFE located in a large city in Southwestern Ontario, Canada. This RCFE offers residents private rooms, in which they have their own bed and small personal living space, and semi-private rooms that are shared with another resident. Additionally, this RCFE offers numerous outdoor areas that are safe for residents to explore and enjoy, as well as indoor living and dining areas that are available for resident enjoyment. A friendly service dog lives and roams these indoor areas in attempt to provide animal assisted therapy to residents, and 24-hour nursing care is provided for all residents. There are also other on-site therapy services provided to residents including physiotherapy, occupational therapy, and a dietitian. Furthermore, this RCFE offers a wide variety of recreation and spiritual resources that cater to all residents. These resources include: Nintendo Wii and X-Box Kinect gaming consoles; a large screen television with a DVD player and large DVD library; puzzles, word searches, and crosswords; musical instruments; board games; books, audiobooks, and magazines; book clubs and library partnerships; wool, knitting supplies, and a sewing machine; quilt knitting groups; working gardens for vegetables or flowers; historical lectures and partnerships with local

museums; art therapy; culinary trips to local schools, restaurants and wineries; guest speakers from local artisan businesses; a variety of musicians and local choirs; spiritual and religious services; pastoral visits; religious observations; Bible study; hymn sings; cultural and language specific services and literature.

Purposive Sampling. Due to the qualitative nature of this research, purposive sampling was used to select participants for this study. Purposive sampling refers to selecting information-rich cases to study, which limit empirical generalizations and allow for an in-depth understanding of the research questions (Savin-Baden & Major, 2013). More specifically, rather than randomly selecting participants, the researcher deliberately targets participants who are experienced with the phenomenon under study in order to gather information relevant to the research question. Participants were selected from a RCFE home in Southwestern Ontario to ensure the sample was representative of individuals who are older adults living in a RCFE. Moreover, residents were selected only if they displayed sedentary behaviour and limited social engagement. An indicator of these characteristics is if an individual does not participate in programming available at the RCFE they reside at and if a majority of their time is spent isolated in their private room. Therefore, for the purpose of this research, individuals who displayed these characteristics were deemed to have limited social interaction and be primarily sedentary. Furthermore, RCFE residents were not selected for this study if they displayed patterns of physical activity, if they participated in available programming, and if they often socialized with others in the facility. Overall, selecting participants who displayed sedentary behaviour and limited social engagement allowed me to answer the research questions by determining if the intervention in this study improved these concepts.

Participant Recruitment. I relied on gatekeepers to help me identify individuals that fit the selection criteria for research participants. According to Hammersley and Atkinson (1995), a gatekeeper is an individual who has an official or unofficial role at the research site and assists the researcher in identifying potential participants; a gatekeeper often has ‘insider’ status at the research site (Creswell, 2012). For this research, I relied on the two recreation therapists I established a connection with during my initial meeting at the RCFE, to act as gatekeepers. I felt the need to utilize gatekeepers for this research because I entered the research site with no prior knowledge of its residents. I felt confident the recreation therapists, who worked with most residents on a daily basis, would be capable of identifying the most ideal participants for my research.

Participants. A total of four RCFE residents participated in my research. These individuals ranged in age from 66 to 100, and all displayed different levels of functionality. More specifically, Lily –100 years of age, is unable to walk and confined to a wheelchair. In addition, two out of the four participants are able to walk, but require an assistive device in the form of a walker to do so. These participants include: Julia – 88 years of age, and Clint – 87 years of age. Only one out of the four participants, David – 66 years of age, is fully functional and able to walk without an assistive device. For the purpose of this thesis, all participants’ names have been replaced with a pseudonym.

While facilitating the intervention for this research, I developed a relationship with each participant, and through this relationship I was able to learn more about them. For the purpose of this thesis I will share noteworthy information I learned about all participants to provide more contextual information. All participants had been residing at the RCFE for an extended period of time; they could not provide an exact time frame, however, all acknowledged that they had been

living at the RCFE for over one year. Lily and David lived in private rooms, whereas, Julia and Clint lived in semi-private rooms with a roommate. Julia and Clint both perceived their roommate as a nuisance and attempted to avoid all interactions. All participants explained that they had limited social engagement with others residing at the RCFE. Participants limited socialization occurred when they were brought to the dining hall for meals or when RCFE workers entered their rooms to perform daily duties. The majority of social interaction participants had was when their family came to visit. Lily, Julia, and Clint's family came to visit on a weekly basis, but David's seldomly came. All participants acknowledged that they spent a majority of their time waiting in their room and hoping that their family would come visit. All participants did not enjoy and declined to participate in the recreation and spiritual resources available to them at the RCFE, with two exceptions. Julia enjoyed attending the colouring club, but explained she simply went to colour and had minimal interaction with others. Clint attended spiritual services regularly throughout the week, however, did not interact with others. Participants acknowledged that they were sometimes forced to attend recreation and spiritual programs, however, they would just sit there for the duration of the program with limited participation. Rather than participate in programs, all explained that they would rather stay in their room and watch television as they waited for their family to arrive. During the initial meeting with Julia and Clint, each participant was very open to speaking with me. However, during the initial meeting with Lily and David, each participant was hesitant to speak. After approximately 30 minutes, Lily and David both began to open up and tell me more about themselves. Other than conversation centered on the ACT sessions, all participants focused conversation on their families and memories from earlier in life. Often times after the session, participants did not want me to leave their room and always asked when I was coming back next.

Overall, all participants were pleasant to interact with and they continually opened up and told me more information as the sessions progressed.

Intervention. I created the intervention featured in this study. It was eight weeks in duration, where participants engaged in one, 30-minute to one-hour session per week. The first two weeks of the intervention were focused on ACT, the third week focused on a combination of ACT and Nintendo Wii gameplay, and the fourth to final week focused on Nintendo Wii gameplay. For all ACT sessions, participants worked one-on-one with me. Refer to Appendix B for the specifics of each ACT session. Refer to Table 1 for the topic of each intervention session.

Table 1: *Weekly Intervention Sessions*

Week #	Topic(s)
1	<ul style="list-style-type: none"> • ACT with a focus on the aims of ACT, values-based action, and negative self-talk
2	<ul style="list-style-type: none"> • ACT with a focus on living in the present moment, values-based action, and acceptance
3	<ul style="list-style-type: none"> • ACT with a focus on connecting what has been learning during ACT sessions to participation in Nintendo Wii gameplay • Nintendo Wii gameplay with facilitator
4-6	<ul style="list-style-type: none"> • Nintendo Wii gameplay with facilitator
7	<ul style="list-style-type: none"> • Nintendo Wii gameplay with facilitator and another participant
8	<ul style="list-style-type: none"> • Nintendo Wii gameplay with facilitator and another participant

During the initial Nintendo Wii gameplay session in week three, the facilitator began by showing each participant the Nintendo Wii Remote, explained how to hold it, identified the buttons used for gameplay, and explained that the wrist strap must be placed on the wrist at all times for safety. Next, the facilitator played the Nintendo Wii in front of each participant to

provide him or her with a gameplay visual and encouraged questions in attempt to develop participant understanding of how to play. After the demonstration period, the facilitator allowed each participant to play while closely monitoring each individual to continually explain how to properly play and to give feedback in attempt to improve participants' ability to play. During weeks four, five, and six the facilitator began each session by briefly playing the Nintendo Wii in front of each participant so participants were provided a visual and could ask questions about gameplay. For the remainder of each session the facilitator participated in gameplay with each participant, while continually providing feedback and tips in attempt to improve gameplay ability. During weeks seven and eight, rather than a participant and the facilitator participating in gameplay, two participants played the Nintendo Wii together while the facilitator supervised; the same two participants were grouped together for weeks seven and eight. During these sessions the facilitator did not participate in gameplay, but rather, provided feedback when necessary and helped with any difficulties.

Measures

Interviews. Interviews were used as the central method of data collection for this research. Interviews are a conversation between two people, an interviewer and an interviewee, where the interviewer asks the questions and the interviewee provides answers. More specifically, "the interviewer guides the conversation and strives to understand the participant's views as well as the meaning of what they say" (Savin-Baden & Major, 2013, p. 358), whereas, "the [interviewee's] responsibility is to share something from his or her perspective or experience" (Savin-Baden & Major, 2013, p. 358). Although this conversation occurs in a research setting, it should replicate the elements of a natural conversation so that the interviewee feels comfortable enough to provide in-depth information (Savin-Baden & Major, 2013). Thus,

conducting interviews is an ideal way for a researcher to use one-to-one communication to thoroughly explore the interviewees' experiences and opinions regarding the phenomenon of interest; this is the most common data collection method for qualitative inquiry (Savin-Baden & Major, 2013). For the purpose of qualitative research, interviewees are selected because they have detailed knowledge on the topic being studied, which will provide the researcher with relevant data to answer the research question. Therefore, to answer the research questions in this study, the older adults who participated in the eight-week Nintendo Wii physical activity program in combination with ACT were interviewed individually to gather their perspective on the intervention. Gathering data through interviews ensured trustworthy results for this study because conducting interviews to collect data is a method that is well-respected by qualitative researchers (Savin-Baden & Major, 2013).

Interviews conducted for this research were semi-structured in attempt to make the interviewees comfortable by replicating the elements of a natural conversation, while keeping the interaction focused to ensure all questions were answered. During semi-structured interviews the interviewer follows an interview protocol to ask questions in a particular order; yet, probes discussion and asks additional questions to promote discussion of relevant information in more detail (Savin-Baden & Major, 2013). Semi-structured interviews were appropriate for this research because asking questions in mostly the same order to each interviewee facilitated data analysis by making the responses to each question easy to find and consequently, easy to compare. Moreover, Savin-Baden and Major (2013) state "semi-structured interviews are a good approach when the researcher has only one opportunity to interview someone" (p. 359), which aligns with this research because I only interviewed each participant once after they had participated in the Nintendo Wii physical activity program in combination with ACT.

Furthermore, when conducting interviews, I ensured that I adequately listened to and observed the interviewee, as these are key for conducting a good interview (Savin-Baden & Major, 2013). I focused on listening rather than talking too much because it was important that I let the interviewees talk as much as possible so that they yielded adequate data. I also attempted to keep an open mind and avoid judgment on interviewee responses, even if I did not agree with them, so they continued to talk freely while providing their unique perspective.

To conduct a thorough, high quality interview, Quinn Patton (2002) explains that six types of questions should be asked of the interviewee. Questions focused on experience and behaviour should be asked “to elicit behaviours, experiences, actions, and activities that would have been observable had the observer been present” (p. 348-350). Opinion and values questions should be asked so the interviewee can speak on some experience or issue. Feeling questions attempt to elicit the emotions an interviewee has on an experience of interest. Oftentimes, feeling questions are confused with opinion and value questions so the interviewer must seek adjective responses from the interviewee, such as anxious, intimidated, excited, and so on, to ensure the question is answered adequately. Moreover, apart from opinions and feelings, knowledge questions should be asked to determine factual knowledge that the interviewee holds. Sensory questions should be asked so the interviewer can gather information on what the interviewee saw, heard, touched, tasted, and smelled during an experience. Finally, background questions should be asked to identify characteristics of the interviewee so they can be located in relation to other interviewees.

When incorporating the six types of questions into an interview protocol, Quinn Patton (2002) suggests that the questions be asked in a particular order. Sequencing questions in a particular order should yield the best responses from interviewees, while following the semi-

structured interview model. An interview should begin with experience and behaviour questions because they require minimal recall and interpretation, and thus are relatively easy to answer. These types of questions allow the interviewee to provide descriptive responses, which often lead to straightforward answers. Once the interviewee has begun talking descriptively about an experience, opinion and values, and feeling questions should be asked so the interviewee can provide their interpretations of the experience. Interviewees will be prepared to answer opinion, values, and feeling questions because moments before they would have “verbally relived the experience” (p. 352). Finally, after some rapport has been built through the aforementioned questions, the interviewee should be asked knowledge questions because trust is necessary before an individual is willing to speak on what they actually know.

When questions are asked during an interview, Quinn Patton (2002) recommends that each question be open-ended, neutral, singular, and clear because the wording significantly affects the given response. Asking an open-ended question avoids interviewer preconception of how the question will be answered, while allowing the interviewee to be expressive and respond in his or her own words. Dichotomous questions should also be avoided and replaced with neutral questions so the interviewee can be expressive and provide an in-depth response, rather than a yes or no answer. Singular questions should be asked to limit the confusion associated with asking multiple questions at once and the interviewer must ensure these questions are asked clearly. To ensure clarity the interviewer must determine the language the interviewee uses and incorporate this language into the questions being asked.

In order to yield high quality interviews and adequately collect data for this research, I followed the procedural recommendations made by Quinn Patton (2002) and Liamputtong (2009). To further promote interviewee comfort and ensure these individuals were prepared to

have an in-depth conversation, I started the conversation based on something of mutual interest. It was not particularly challenging to ensure interviewee comfort because rapport was already developed due to working together through the eight-week intervention. Next, I explained the purpose of my research to the interviewee and explained to them how important their responses will be to further develop knowledge in this field. When entering the interview, the interviewee should have already been aware of the purpose of this research due to my work with them throughout the intervention; however, I brought it up again to ensure that it is present in the interviewees' mind during the interview. After this had been established and I began asking the interviewee questions, I made brief notes based on their body language and gestures in relation to each question. Notes about these nonverbal signals were essential to develop understanding of what the interviewee actually meant through their response (Savin-Baden & Major, 2013). Since these nonverbal signals were not present in the taped audio recording of the interview, I inserted them into the written transcripts of the interviews I transcribed so that they were present during data analysis. Near the end of the interview, I asked the participant if there was anything that they wished I had asked or if there was anything they wished to elaborate on. The steps taken after all interview questions had been asked were in place to ensure the interview is credible. Finally, when the interview had concluded I thanked each interviewee for their participation in my research and acknowledged again how important their knowledge is to further develop quality programming for older adults residing in RCFEs.

Observation. In addition to interviews, observation was used to collect data for this research. Marshall and Rossman (1989) describe observation as “the systematic description of events, behaviours, and artefacts in the social setting chosen for study” (p. 79). This systematic description provided the researcher with data that was as accurate as possible while developing

the researchers' holistic understanding of participant experiences (DeWalt & DeWalt, 2002). Thus, through observation the researcher was able to develop nuanced contextual knowledge of the phenomenon under study, which could not be gained through other forms of data collection (Savin-Baden & Major, 2013). Moreover, observation allowed the researcher to gather information that participants may not share during interviews because self-reported information is sometimes different from actual information (Savin-Baden & Major, 2013). For the purpose of this research, collecting data through observation allowed me to better understand participants' experiences during the Nintendo Wii physical activity program in combination with ACT, which consequently, allowed me to more effectively answer the research questions; this improved the value and validity of the study (Savin-Baden & Major, 2013).

When conducting observation for this research I followed the strategies outlined by Savin-Baden and Major (2013, p. 399-400) to ensure that the observations were performed accurately and yielded the highest quality data. To begin, it was suggested that I have a plan when entering observation. To achieve this, I performed selective observation that was focused on situations that were important to answer the research questions. Specifically, I performed observation when participants were engaged in the ACT sessions, Nintendo Wii-based physical activity program, and during interviews at the end of the eight-week intervention. This observation was structured, as I used a predetermined template to record observations based on sensitizing concepts identified in literature; however, I also included observations on salient information when it arose. This observation was also retrospective, which means that I did not write down observations until each participant left the research room at the conclusion of each session (i.e., I did not take field notes publicly in front of participants). I performed retrospective observation so I could place my full attention on interacting with the participants and leading

successful sessions, rather than placing my attention on writing down observations during each session, which I assume would reduce the quality of the sessions. Throughout the Nintendo Wii-based physical activity program, I observed clothing the participant wore, their level of participation, interest in the program, interaction between participants, support and cooperation between participants, interaction with me (the program facilitator), facial expressions, gestures, body language, posture, physical fitness, functionality (endurance, agility, and ROM), and manipulation of the Wii remote. When observing the ACT sessions, I focused only on subtle factors such as facial expressions, gestures and body language, posture, and verbal expression. I limited my observation to these subtle factors because I am a novice ACT therapist and needed to place more focus on interacting with the participant in order to lead a successful session. Furthermore, when observing during interviews, I focused on facial expressions, gestures and body language, posture, and verbal expression because interviewees often provide additional information through their body language (Savin-Baden & Major, 2013). Continuous observation allowed me to make note of these signals after each session to ensure I understood what interviewees actually meant. Overall, the selective and structured nature of my observation highlights my pragmatic philosophical stance because I observed the most appropriate situations and sources to adequately answer the research questions.

Savin-Baden and Major (2013) indicate that it is important for a researcher to identify a stance during observation because researcher presence often influences the situation. Therefore, while leading each aspect of the intervention and conducting observation, I assumed the researcher stance of a balanced participant. Fetterman (1998) explains that balanced participation “combines participation in the lives of the people being studied with maintenance of a professional distance that allows adequate observation and recording of data” (p. 34-35). To

achieve this, I joined in on all aspects of the intervention, however, I lead participants through each aspect rather than being a participant myself. More specifically, I acted as a therapist during the ACT sessions to develop a therapist-patient relationship with the research participant; the focus was on the participant and not myself. I acted as the program facilitator during the Nintendo Wii physical activity program to setup and lead participants through the program without participating myself. Moreover, throughout interviews I assumed the role of interviewer and maintained a professional distance while conducting and leading the interviewee through the interview. Although leading each aspect of the intervention developed my relationship with participants and allowed me to become an insider, I left the research site at the conclusion of each step to maintain my outsider role and further ensure balanced participation. In addition to researcher presence, Savin-Baden and Major (2013) explain that the place observation occurs significantly influences the findings. To ensure all participants had the same experience throughout the intervention, I set up the room in the same way and kept my instructions consistent for all participants by following a script. Furthermore, Savin-Baden and Major (2013) identify that the location should be unobtrusive to allow for more natural participant action and to ensure that no one is observed without their consent. To achieve this, I closed the door while the intervention was being conducted to fully eliminate outsider access.

Data Analysis

To answer the research questions for any study, the researcher must analyze the data in order to make sense of it (Savin-Baden & Major, 2013). Researchers often fail to outline the data analysis process and it seems as though the results appeared “by magic” (Savin-Baden & Major, 2013, p.434). Therefore, for the purpose of this research, all aspects of data analysis are clearly explained to ensure robust results. To analyze all data in this study, content analysis and thematic

analysis was performed. Content analysis is an “analysis of the frequency and patterns of use of terms of phrases” (Savin-Baden & Major, 2013, p. 438), where the researcher “make[s] inferences by systematically and objectively identifying specified characteristics within text” (Stone, Dunphy, & Smith, 1966, p. 5). Thematic analysis is the process of identifying themes in the data (Savin-Baden & Major, 2013). Content analysis and thematic analysis were used to analyze the interview data; I will elaborate on the specifics of each method in the following paragraphs.

Interview Data. To initiate the analysis of interview data, I transcribed the data from each audio recording into written verbatim. In order to achieve triangulation during the analysis of interview data and to ensure findings are dependable, I used three different analysis strategies including: inductive within-interview content analysis (phase one); inductive cross-interview content analysis (phase two); deductive cross-interview thematic analysis (phase three) as recommended by Quinn Patton (2002). Phase one and two of this analysis featured an inductive component that built concepts, theories, and hypotheses (Merriam, 2009). Inductive analysis is important because it provided me with greater insight into the outcomes of the intervention. Although outcomes arose that are unrelated to literature on this topic, they were still beneficial in overall understanding of the intervention and potentially lead to future research questions. Phase three of this analysis featured a deductive component that allowed me to test preconceived assumptions (Merriam, 2009). More specifically, this deductive analysis was driven by themes present in the literature and attempted to determine if these themes arose. Identifying themes through this thematic analysis allowed me to develop knowledge on the intervention as it relates to literature and thus, allowed me to adequately answer the research questions.

To initiate phase one of the interview analysis, I read one interview transcript in its entirety to familiarize myself with the data. I then read the interview again in search of salience and highlighted data I deemed valuable. Next, I read the interview a third time, paying close attention to the highlighted material in attempt to cluster it into patterns. While searching for patterns, I highlighted any salient data I may have missed during the prior reading and took this data into consideration when identifying patterns. Once patterns were developed, I created a summary chart that clearly presented all patterns identified in the interview transcript. I repeated this approach for all interview transcripts. After all interview transcripts were analyzed and summaries were developed, I created an overall summary chart for phase one. To create this chart, I analyzed the summaries from each interview and clustered patterns from all interviews together.

Phase two of data analysis was focused on analyzing specific questions from each interview. Rather than analyzing each interview transcript as a whole, I focused on each question and analyzed it across all interview transcripts. To initiate this phase of data analysis, I read only the first question of all interview transcripts. I then completed a second reading of the same data and highlighted salient information. Next, I read the data a third time and attempted to cluster the highlighted material into patterns, however, when unique data arose, I did not ignore it and attempted to include it in a corresponding cluster. Once I finished the third reading of the first interview question in each transcript, I created a summary chart that presented all patterns identified in the first question. I repeated this approach for each question in the interview transcript until I reached the end of the document. After each question had been analyzed and a summary for each question had been developed, I created an overall summary chart based on this information. This overall summary chart clustered patterns from all interview questions together.

Furthermore, at the conclusion of phase two I analyzed the overall summary charts from phase one and two together, in attempt to connect the findings from each phase. After considering the relatedness of each phase I developed a master chart, which presented the major patterns identified in phase one and two.

The final phase of interview data analysis was performed to determine if the collected data confirms or contradicts assertions made in existing literature. To achieve this, I conducted this phase while continually thinking about important concepts from the literature review. I began by thoroughly examining the literature review to determine which information connects with the research questions. Next, I read the first question of all interview transcripts to familiarize myself with the data and to start thinking about how this data aligns with existing research. I then read through the first question in all interview transcripts again and highlighted sensitizing concepts that relate to my research questions and existing literature. After this I created a summary chart that presented all deductive findings from the first interview question. I repeated this approach for each question in the interview transcript until I reached the end of the document. After a summary chart had been developed for each question, I created an overall summary chart that connected all deductive information identified during this phase. Finally, I compared the overall summary chart from this phase to the master summary chart from phases one and two in order to determine what information connects. I then created a final chart that includes findings from the three phases of interview transcript data analysis.

Observational Data. To analyze data gathered through observation, I conducted an inductive and deductive analysis of the field notes. Deductive analysis was important when analyzing field notes because it allowed me to connect observational information to findings from interview analysis, existing literature, and the research questions. Inductive analysis was

important because it allowed me to identify any other sensitizing information that is not connected to existing literature. Overall, these two approaches enhanced the overall understanding of the intervention. When performing the observational data analysis, I worked across the field notes to analyze each category of observations. More specifically, I analyzed the facial expressions category of all field notes, and then I analyzed the body language category and so on.

To initiate deductive analysis, I read my literature review, the final chart from interview analysis, and my research questions to ensure they were present in my mind. Next, I read the first category of all field notes to become familiar with the information. I then read the first category again and highlighted concepts that relate to existing literature, the final interview analysis chart, and the research questions. After this, I created a summary chart that lists important deductive findings from the category. I repeated this approach for all categories in the field notes until I reached the end of the document. After, I used the summaries of each category to create an overall summary chart that connects all deductive information gathered through observation. Finally, I compared this overall summary chart to the interview analysis final chart and updated that chart with new information from the observational summary chart.

To initiate inductive analysis, I read the first category of all field notes to familiarize myself with the data. I then read the first category again in search of salience and highlighted information that stood out. Next, I read the first category again in attempt to cluster the highlighted material into patterns. Once patterns had been developed, I created a summary chart that clearly presented all patterns identified in the first category of observations. I repeated this approach for all field note categories. After all categories had been analyzed, I created an overall summary chart that connects salient information. I compared this summary chart with the final

chart containing interview analysis and deductive observation analysis and updated the final chart accordingly.

Chapter 4 – Findings

In this chapter, I present the consolidated inductive within-interview content analysis, inductive cross-interview content analysis, deductive cross-interview thematic analysis, and the inductive and deductive analysis of observational field notes. More specifically, I report salient information, patterns, and inductive and deductive findings relative to each research question based on the combined data analysis of all four interviews and observational field notes. Refer to Table 2 for a summary of the main findings from this research.

Table 2: *Summary of Main Findings*

<p>Salient Information</p>	<ul style="list-style-type: none"> • Participants with minimal functionality (e.g., confined to a wheelchair with limited arm strength and range of motion) have the capacity to successfully play the Nintendo Wii if one is able to hold the Nintendo Wii remote in his or her hand. • Nintendo Wii gameplay appears to stimulate the mind and improved memory. • Nintendo Wii provides a convenient outlet for physical activity due to its ability to operate anywhere that has a television. • Nintendo Wii gameplay closely resembles real-life activities and reminds participants of family and friends, which elicits positive memories and feelings. • Participants' favourite Nintendo Wii game is bowling on 'Wii Sports'. • Participants value family above all else. • Participants are in agreement with and abided by ACT principles during the intervention.
<p>Patterns</p>	<ul style="list-style-type: none"> • Participants were anxious to initially play the Nintendo Wii during the first session; however, after the first session, participants displayed excitement to participate in Nintendo Wii gameplay. • During initial Nintendo Wii gameplay sessions, participants experienced difficulties pressing buttons on the Nintendo Wii remote. • With practice and continuous instruction from the facilitator, participants significantly improved in Nintendo Wii gameplay ability.

	<ul style="list-style-type: none"> • Throughout the intervention participants continually experienced difficulty being consistent while playing the Nintendo Wii. • Throughout the intervention participants were continually attempting to improve Nintendo Wii gameplay ability. • Participants display interest in participating in Nintendo Wii gameplay even when struggling to successfully play and be consistent. • Participants enjoyed the tactile component of manipulating the Nintendo Wii remote to play. • Participants found the Nintendo Wii remote easy to hold and manipulate. • Participants understood the focus of ACT. • Participants enjoyed the ‘Imagery of Best Self’ ACT mindfulness activity. • Participants did not enjoy and became confused by the ‘Loving-Kindness for Ourselves’ ACT mindfulness activity. • Participants did not enjoy and became confused by the ‘Pushing Against the Clipboard Metaphor’ ACT activity. • Participants connected participation in Nintendo Wii gameplay to their value of family.
<p>Research Question #1 (What aspects of the program affect participants’ willingness to participate in other programs available at their residence?)</p>	<ul style="list-style-type: none"> • Participants do not enjoy participating in physical activity in large groups. • Participants prefer to work one on one with a facilitator or in small groups due to the lack of competition, privacy, and ability to develop a relationship with the facilitator and other participants. • Participants may be more likely to participate in available programs if the facilitator develops a caring relationship with them. • A patient facilitator made learning how to play the Nintendo Wii an enjoyable experience despite participants’ early struggles. • Participants prefer to participate in physical activities that are fun and do not feel like exercise.
<p>Research Question #2 (If and how the program affects participants’ perceptions of his or her physical and psychosocial health?)</p>	<ul style="list-style-type: none"> • Participants acknowledged that Nintendo Wii gameplay required one to be physically active; however, three out of four participants perceived that their physical health did not improve after participation in the program. One participant (David) perceived that his arm range of motion had improved after the program. • There is potential for increased physical health improvement when two participants play the Nintendo Wii together because they may use increased musculature

	<p>while playing in attempt to gain a competitive advantage over their partner.</p> <ul style="list-style-type: none"> • Participants perceived that participation in this program increased their mental health levels because they reported that they felt happier. • Participants perceived that participation in Nintendo Wii gameplay with a partner improved their social functioning because they developed a relationship with their partner through gameplay. • Socializing that occurred between participants during Nintendo Wii gameplay lead to increased socialization outside of the program.
<p>Research Question #3 (Do the motivational properties of the program increase participants' motivation to initiate and adhere to a physical activity program?)</p>	<ul style="list-style-type: none"> • Motivational properties of ACT play a part in increasing participants' motivation to initiate and adhere to a physical activity program. • Participants enjoyed creating avatars that resembled themselves on the Nintendo Wii. • Participants enjoyed motivational commentaries and music during Nintendo Wii gameplay. • Nintendo Wii gameplay provided an outlet for participants to participate in activities that were once enjoyed, which lead to the emergence of positive memories and feelings. • Participants enjoyed having choice on different games to play on the Nintendo Wii. • Physically compromised participants (e.g., confined to a wheelchair with limited arm strength and range of motion) can successfully play the Nintendo Wii. • During Nintendo Wii gameplay no participants felt unsafe or were injured.

Salient Information

During Nintendo Wii gameplay sessions, participants with differing levels of functionality were observed participating successfully in Nintendo Wii gameplay. I observed David and Clint participate successfully while standing up and using full shoulder range of motion. I observed Julia play while sitting on her assistive device; however, she moved her assistive device to the side during the final gameplay session in order to stand up while playing. Most importantly, I witnessed participants with low levels of functionality successfully

manipulate the Nintendo Wii remote during gameplay. Specifically, Lily was unable to move her hand holding the Nintendo Wii remote away from her body in order to move it to play the game. To successfully play, Lily used her non-playing hand to support and hold up her hand holding the Wii remote. Using two hands provided Lily with more control over the Wii remote so she could move it away from her body and manipulate it accordingly to successfully play the Nintendo Wii. Thus, through my observations I am able to conclude that individuals with minimal functionality have the capacity to successfully play the Nintendo Wii if one is able to hold the Nintendo Wii remote in his or her hand.

What I believe to be a very interesting finding was how Nintendo Wii gameplay stimulates the mind and leads to memory improvement. During a Nintendo Wii gameplay session, Clint explained that residents in RCFEs rarely need to think or rely on their memory because healthcare workers perform all necessary daily tasks, such as waking residents up in the morning, putting residents to bed at night, cooking, cleaning, bathing, and administering medication, among other important tasks. Clint also explained how he has noticed his memory deteriorate with age and has spoken with other older adults who report similar findings. However, Clint explained that participation in Nintendo Wii gameplay stimulated his mind and forced him to think and use his memory while attempting to remember how to play different games, what buttons to push, and how to continually improve. During his interview Clint (Interview, March 14, 2018) stated:

I think about playing these games when I'm lying in bed. I think about oh why did I steer so hard when I was driving that car and it has given me something else to think about. Something to stimulate my mind. Something I have noticed is that my memory is a lot better than what it was.

David (Interview, March 14, 2018) echoed Clint's statements during his interview when he explained, "I have a very bad memory and sometimes I can't remember my friend's names. After I play the Wii somehow I can remember some names and then that makes me want to tell you stories I remember about them."

In most RCFEs there are rooms dedicated to physical activity. However, there are numerous possibilities that may restrict access to these rooms, which in turn may limit residents' participation in physical activity on any given day. During this intervention the room being used for Nintendo Wii gameplay was occupied on two different occasions. Rather than rescheduling and leaving participants without physical activity on those days, I connected the Nintendo Wii to each participant's television in their private room so gameplay could occur. Through analysis of observational field notes, I concluded that the Nintendo Wii provides a convenient opportunity for physical activity due to its ability to operate anywhere that has a television. The Nintendo Wii gameplay sessions in a small, private room and a large room designed for physical activities were the same and no problems arose through participation in a small room. David (Interview, March 14, 2018) was fascinated by playing the Nintendo Wii in his own room and stated, "I can even bowl in my room or something like that. I thought it was really neat when you set the Wii up right in my room rather than bringing me to the room we usually go to."

A pattern discussed by all participants interviewed was the pleasant memories Nintendo Wii gameplay elicited. All participants spoke of memories of family and friends being the most memorable aspect about participating in Nintendo Wii gameplay. Julia (Interview, March 14, 2018) stated, "my husband and I used to play in a bowling league and playing with you really reminded me of my husband and brought back great memories." Consequently, these memories lead to the emergence of positive feelings in participants. David (Interview, March 14, 2018)

explained, “I used to play in a bowling league with my girlfriends and playing the Wii reminds me of that, it brings back really good memories and makes me very happy.” Through analysis it has been determined that the Nintendo Wii has the potential to elicit such positive memories due to the perception that the Nintendo Wii closely resembles real-life activities such as bowling, golfing, fishing, and vehicle driving to name a few. During gameplay sessions all participants became excited and mentioned how they felt as though they were participating in real-world activities during Nintendo Wii gameplay; Clint (Interview, March 14, 2018) explained, “I can’t believe how similar it is to real bowling I feel like I’m at the bowling alley.”

Although participants were not offered all available Nintendo Wii games, data analysis revealed a pattern that participants’ favourite Nintendo Wii game is ‘Wii Sports’. During Nintendo Wii gameplay sessions participants were provided choice on what games they wanted to play. The first game chosen by every participant during every gameplay session was Wii Sports and during some gameplay sessions participants would not change this game. Wii Sports provides players with the ability to play five different sports – tennis, bowling, golf, baseball, and boxing. Out of these five sports, participants enjoyed bowling the most. While playing Wii Sports, Julia and Lily would often speak with great enthusiasm and talk to the bowling ball as it rolled down the lane; they did not show as much interest in other games. During interviews, when participants spoke on the Nintendo Wii they always referred to playing Wii Sports. David (Interview, March 14, 2018) stated, “I would much rather just play Wii bowling with you, I really love doing that” and Clint (Interview, March 14, 2018) declared his most memorable moments from Nintendo Wii gameplay were “beating [me] in bowling. I like the bowling a lot it is very much fun.”

While reflecting on and analyzing the ACT sessions, an aspect that I deemed salient is the importance of family to older adults. All participants used great expression and became excited when speaking about family. When asked if there was anything she found memorable about the ACT sessions, Lily (Interview, March 14, 2018) responded by stating, “not really other than talking about my family. I really liked showing you pictures of my children and talking about them when you asked me questions. I love them all dearly.” Julia and Clint also deemed discussing family as the most memorable aspect of the ACT sessions. In addition, during the ‘Coat of Arms’ ACT activity all participants expressed that they value family above all else.

After analysis of all interviews and observational field notes, a pattern arose which demonstrated that older adults are in agreement with ACT principles. Clint (Interview, March 14, 2018) explained, “I’m going to try to think more like ACT has shown me, to get over that negative feeling and do new things anyways because good always comes from it.” All participants acknowledged during interviews that negative feelings will not stop them from trying something new. Before the initial Nintendo Wii gameplay session I observed how nervous participants were as David was stuttering his words and attempting to control his breathing, and Clint, Lily, and Julia all stated their nervousness. Although they were nervous, they abided by the ACT principles and attempted to play the Nintendo Wii demonstrating that ACT has empowered them to try new things regardless of the negative feelings that accompany novel tasks.

Patterns

A pattern evident across all the analyzed data was that all participants became anxious prior to Nintendo Wii gameplay, which was presented in the Salient Information section. Prior to Nintendo Wii gameplay, my understanding of ACT led me to hypothesize that this pattern would

emerge. Although participants became anxious before initial participation in this novel task, they also displayed a pattern of excitement to participate in Nintendo Wii gameplay. After participants experienced Nintendo Wii Gameplay for the first time, their anxiety subsided, and they displayed pure excitement to participate. When interacting with participants on Nintendo Wii gameplay days I was always greeted with a smile and participants voiced their excitement to begin playing. Lily (Interview, March 14, 2018) and Clint (Interview, March 14, 2018) spoke on this excitement while being interviewed. Lily stated, “I got excited on Wednesdays because I knew you were coming in and then I just patiently waited for you to arrive” and Clint explained, “Oh I was really excited, I wanted to try it and after we tried I always wanted to play.”

Although participants were excited and thoroughly enjoyed Nintendo Wii gameplay, all participants experienced difficulty during the initial gameplay session. Participants had no trouble holding or moving the Nintendo Wii remote. Rather, participants experienced difficulties pressing buttons on the Nintendo Wii remote. During her interview, Julia (Interview, March 14, 2018) explained the only thing she disliked about playing the Nintendo Wii was “trying to learn how to use the button and when to let go of it to [play].” However, with practice and continuous instruction from the facilitator, participants experienced significant improvements in Nintendo Wii gameplay ability. At the end of the first Nintendo Wii gameplay session all participants were struggling with gameplay and needed constant instruction in order to play successfully. By the end of the third session Clint and David were playing the Nintendo Wii successfully with little to no instruction. Lily played successfully with little to no instruction by the end of the fourth session and Julia by the end of the fifth session.

Despite significant improvements in each participant's Nintendo Wii gameplay ability as the intervention went on, participants continually experienced difficulty being consistent in Nintendo Wii gameplay. Participants understood how to play the Nintendo Wii, but could not perform required movements consistently. For example, during the final two gameplay sessions all participants could play Wii bowling without asking how to release the bowling ball down the lane. However, participants still struggled to move the Wii remote while simultaneously pressing a button in order to release the bowling ball down the lane successfully every attempt. Lily (Interview, March 14, 2018) summed up these Nintendo Wii gameplay consistency issues when she explained:

I like when I get a strike but I don't like when I can't throw the ball down the alley every time. I don't understand. I do the same thing every time and sometimes it works and sometimes it doesn't.

During all Nintendo Wii gameplay sessions, participants were continually attempting to improve Nintendo Wii gameplay ability. For example, Lily and David kept asking how to throw the bowling ball straighter; Julia always verbally talked herself through the gameplay instructions and asked multiple gameplay questions; Clint participated in the first two Nintendo Wii gameplay sessions while sitting down and then stood during participation for the remaining sessions because he felt he was better able to manipulate the Wii remote. Overall, participants' continually seeking improvements in Nintendo Wii gameplay demonstrates that older adults are still interested in participating in Nintendo Wii gameplay even when struggling to successfully play and be consistent.

All participants I interviewed discussed how they enjoyed and preferred the tactile component of manipulating the Nintendo Wii remote to play. There are exergame options

available that do not require a remote to play, such as the X-Box Kinect. However, all participants explained that they “prefer using the remote because I like that feeling of knowing that I have something in my hand that I can use to play. It’s not just holding air you are actually using something and holding something to play” (David, Interview, March 14, 2018). Although some participants experienced difficulty attempting to push the buttons on the Nintendo Wii remote, all participants found the Nintendo Wii remote easy to hold and manipulate. Clint (Interview, March 14, 2018) explained, “I had the strap around my wrist so I wasn’t worried about dropping it or anything. You know something Carson this being hard to use never crossed my mind.”

After analyzing all data related to ACT sessions some interesting patterns emerged. These patterns provide valuable information on how older individuals view participation in the ACT program implemented in this study. After all sessions were complete all participants understood the focus of ACT. Participants were able to answer posed questions, recite back what ACT aims to accomplish, and explain how they will attempt to live by the ACT principles of acceptance, mindfulness, and values-based action in the future. For example, during the second session Clint provided an example of a time he had a negative thought in his head, how it stopped him from doing something he valued, and how he should have accepted this negative feeling and participated in the activity in order to live by his values. During the first session participants enjoyed the mindfulness exercise ‘Imagery of Best Self.’ All participants spoke of how much they enjoyed the good feelings associated with envisioning a time in their life when they were the best version of themselves. Furthermore, during the second ACT session participants enjoyed the mindfulness activity ‘Mindfulness of the Breath.’ All participants explained how relaxed they felt after the activity, how it enabled them to live in the present

moment, and how they wanted to practice this mindfulness activity on their own time. During the third session, participants did not enjoy and became confused by the mindfulness activity ‘Loving-Kindness for Ourselves.’ Before the end of the exercise all participants stopped me and explained how they were confused on what they were supposed to be doing and asked if we could move on to the next activity. In addition, participants did not enjoy the ‘Pushing Against the Clipboard Metaphor’ and viewed it as too complex and confusing. Although the metaphor was meant to help strengthen participant understanding of ACT, all participants stopped me in confusion when I spoke about offering oneself words of kindness and compassion; participants did not understand this concept and it derailed this mindfulness activity. Overall, participants understood how they could live their lives in accordance with ACT and all participants connected participation in Nintendo Wii gameplay to their value of family. Julia explained that she wanted to learn how to play the Nintendo Wii so she could play with her children when they come to visit, Lily and Clint want to play with their grandchildren when they come to visit, and David explained how he wanted his spouse to become more active and was going to learn so he could teach her.

Research Question #1 – Inductive Analysis

To help answer the first research question (What aspects of the program affect participants’ willingness to participate in other programs available at their residence?), participants were asked during the interviews why they did not participate in other programs available at their residence. This interview question served a dual purpose as it was asked to have participants speak about negative aspects of available programming that diminished their willingness to participate. It was also designed to prompt participants to speak about positive aspects of this program, which if implemented in the programming available at their residence,

would lead to an increased willingness to participate. After analyzing the data, a pattern emerged which revealed that participants do not enjoy participating in physical activity in large groups. Rather, participants prefer to work one on one with a facilitator or in small groups due to the lack of competition, privacy, and ability to develop a relationship with the facilitator and other participants. Julia (Interview, March 14, 2018) explained that individuals compete with one another during large group activities, and rather than focusing on others during participation, she wants to focus on herself and have fun. In addition, Lily does not like large groups because she feels as though others are watching her; Lily (Interview, March 14, 2018) explained:

I don't like going down to the big room and doing it with a lot of people. Any time I have went down the girls have us in a big area and there are always people walking around and I don't like so many people looking at me when I'm trying to do something. I would rather be in my room here like we are now or in a private room downstairs. I choose what I like and I would prefer to work with people who I know well and not having strangers around. Yesterday this girl had us do an exercise thing where we were supposed to hit a ball up and I would always hit it down and a lot of people were watching me and I didn't like that very much. I have trouble getting into it when people are watching me.

Observational field notes taken during ACT sessions and Nintendo Wii gameplay sessions when the participants and I were working one on one provide evidence that participants enjoyed the ability to develop a relationship with the facilitator. During these sessions all participants were very interested in talking with me as they sat upright, were expressive, asked numerous questions, told multiple stories, always thanked me for coming, and always asked when I was coming back next. During his interview, David (Interview, March 14, 2018) explained, "doing stuff like this makes me so so happy. I usually spend a lot of time in my room

reading books so when I come out and talk and play with you I absolutely love it.” Additionally, Clint (Interview, March 14, 2018) spoke on how he enjoyed playing the Nintendo Wii due to the ability to connect with other participants and make new friends through gameplay. When two individuals participated in Nintendo Wii gameplay together, I observed them develop a connection through conversation, encouragement, and similar interests. The ability to establish a relationship with the facilitator or another participant during Nintendo Wii gameplay will increase participants’ willingness to participate in other available programs. This is perhaps the case because participants may be more likely to participate in available programs if they have a connection with the facilitator or their friends are participating. For example, after participating in Nintendo Wii gameplay with Julia, Lily asked me if I could bring her to the colouring club so she could join Julia. Overall, the findings show that participants demonstrate an increased willingness to participate in physical activity when working one on one with a facilitator or in small groups due to increased privacy and decreased competition. Working one on one with a facilitator or in small groups also provides participants with the ability to establish a connection with others during physical activity, which may lead to participants following these connections to other available programs.

While facilitating all sessions of the intervention, I provided considerable attention to each participant; we constantly interacted during each session. During conversations with all participants I demonstrated that I was interested in their lives as I asked numerous questions about their interests and let them elaborate on anything they wished to talk about. Often times the conversation was centered on their family and fond memories of earlier in their lives. Through these conversations I was able to prove to participants that I genuinely cared about them. Consequently, as sessions progressed and participants recognized and trusted my authenticity,

they continually told me more about themselves, which made our relationship grow stronger.

Thus, my role in providing attention and a caring relationship to participants may have positively affected their willingness to participate in this intervention. It is plausible that even if participants did not enjoy ACT sessions or Nintendo Wii gameplay, they would participate in order to receive my attention and further develop our relationship.

During this program, I observed participants' skill in Nintendo Wii gameplay develop throughout each session; participants moved from requiring full instruction during the first session to playing with minimal instruction during the final sessions. During three of the four interviews, participants discussed how a patient facilitator made learning how to play the Nintendo Wii an enjoyable experience despite struggles. David (Interview, March 14, 2018) recalled:

When I first came I was kind of just dropping the bowling ball, I wasn't doing very good at all. Now I'm a lot better because you have stuck with me through the hard times to help me and show me how to be successful.

Julia (Interview, March 14, 2018) explained that she is not a fast learner and needed a patient teacher in order to experience success. Additionally, Lily (Interview, March 14, 2018) declared:

You have very good patience, with me especially. If there was someone else in here that kept pushing me and getting upset when I couldn't do it that wouldn't be very much fun at all. I really appreciate that you were very patient with us, I know it takes us much longer than it should to catch on and I just want to thank you for being so understanding and patient. This would have been an awful experience if you weren't so thank you.

It is apparent that if Lily did not have a patient facilitator working with her she would have deemed the experience as 'awful' and probably ceased participation. However, because

participants experienced a patient facilitator that lead them to success during this program, I believe they will develop an increased willingness to participate in other available programs if these programs have a patient facilitator.

Throughout this study, all participants exhibited a negative view of exercise, but all understood and voiced how physical activity is necessary for older adults. Clint (Interview, March 14, 2018) stated, “I don’t like that word exercise (laughs) that’s what I don’t like.” After speaking with participants, it is clear that they associate exercise programs in their RCFE with sitting in a large group and mimicking the movements of the facilitator. Clint (Interview, March 14, 2018) found this type of program very boring and explained, “I just don’t like sitting there. I like action and playing and having fun.” In addition, Lily (Interview, March 14, 2018) stated, “I really like exercising but only when it is fun and doesn’t feel like I’m exercising” and Julia (Interview, March 14, 2018) said, “I also would like to have fun with what I’m doing so it doesn’t feel like work.” Through these statements, it is clear that participants find exercise classes in their RCFE boring and is a main reason why they do not participate. Rather, participants prefer activities they deem fun, such as the Nintendo Wii, to be physically active. David (Interview, March 14, 2018) explained, “I don’t really like that other stuff, it is really boring. I prefer to play the Wii much more, it is a lot more fun.” Clint (Interview, March 14, 2018) also spoke on how fun the Nintendo Wii was when he said, “I was talking to another person who is in this program and she told me how much fun she was having. I just want you to know that I’m not the only one, we all love it.” When activities are fun, I believe they help participants take their mind off the physically active component of participation. Instead, participants focus on fun aspects of participation, such as interaction with other participants or the facilitator. When speaking on playing the Nintendo Wii, David (Interview, March 14, 2018)

explained, “it was exercising because obviously you are moving your arms, but exercise wasn’t something I was thinking about while I was playing. I was thinking about trying to beat you in bowling and having fun with you.” Overall, it is apparent that participants in this study prefer to participate in physical activities that are fun, rather than boring exercise classes. Therefore, participants will be more willing to participate in other physical activity programs if these programs are fun enough to distract participants from the physical exertion required to participate.

Research Question #2 – Inductive Analysis

Results relative to the second research question (If and how the program positively affects participants’ perceptions of his or her physical and psychosocial health?) revealed that, participants were engaged in physical activity during gameplay on the Nintendo Wii exergaming console. During interviews Julia and Lily acknowledged that Nintendo Wii gameplay required one to be physically active; Lily (Interview, March 14, 2018) explained, “I was using my arms to bowl so I felt like I was exercising my arms a lot.” Although Nintendo Wii gameplay provided an outlet for physical activity, three out of four participants perceived that their physical health did not improve after participation in the program. Julia, Lily, and Clint all indicated during interviews that their physical health remained unchanged after participating in the program. However, the outlier, David (Interview, March 14, 2018), felt his physical health, more specifically, his arm range of motion had improved after the program because he can “move [his] arm much easier and more freely to play.” Another interesting finding that emerged through the analysis of observational field notes is the potential for increased physical health improvement when two participants play the Nintendo Wii together. Throughout all Nintendo Wii gameplay sessions Julia sat on her assistive device to play. However, during the final gameplay session she

stood up to play and explained that she wanted to be able to throw the ball harder in order to win. The increased musculature used to stand while playing is directly related to increased physical activity. Thus, attempting to gain a competitive advantage over a partner while playing Nintendo Wii may lead to increases in physical health.

When asked during interviews if the program affected mental health, all participants acknowledged experiencing increases in their mental health. Specifically, all participants identified that participation in this program increased their happiness. Julia (Interview, March 14, 2018) stated, “you coming in gave me something to look forward to every week. I really liked talking to you and playing the game with you it made me really happy.” Lily (Interview, March 14, 2018) explained:

You do make me happier. I really enjoy it every time you come to see me it is the highlight of my day. I look forward to every Wednesday because I know you’re coming and I know my morning will be spent having fun with you and that makes me really happy.

These quotes by Julia and Lily demonstrate the power of providing attention and a caring relationship to older adults living in a RCFE. Showing genuine interest in the lives of older adults and providing them the opportunity to interact with another human being for an extended period of time may have played a role in their increased happiness after the intervention.

Furthermore, David (Interview, March 14, 2018) explained that he spends a lot of time in his room reading alone. However, this program gave him a good reason to leave his room and by talking and playing the Nintendo Wii with me he became happy. Finally, Clint (Interview, March 14, 2018) voiced that, “I definitely feel happy when playing with you especially when I win. It is always great and I feel happy just thinking about it.”

Nintendo Wii gameplay appeared to positively affect participants' perceptions of their social functioning. Participants did not speak on ACT when discussing their social functioning and only attributed increases to Nintendo Wii gameplay with a partner. Participating in Nintendo Wii gameplay with a partner enabled participants to interact with one another, which consequently led to the development of a friendship. David (Interview, March 14, 2018) had a great quote during his interview when he explained:

A lot of people I see in here all they ever do is sleep or not talk to one another so it is very difficult to make new friends or enjoy myself but meeting my partner in this program allowed me to make a new friend which I really really enjoyed. It was a highlight of my time with you. It would be really great if we could continue playing this together when you leave.

Through this quote it is clear that older adults living in RCFEs often do not socialize with one another, however, Nintendo Wii gameplay provides an avenue for social interaction. During his interview, Clint explained that he wants to start teaching others how to play the Nintendo Wii so more people can participate. The socializing that occurred between participants during gameplay sessions also led to increased socialization outside of the program. More specifically, Julia (Interview, March 14, 2018) explained that her and the other participants in this research met to discuss the program. During this discussion one of the participants mentioned a card game that everyone knew how to play, so the group ended up playing and setting future dates to play. Furthermore, after a gameplay session with Julia and Lily, these participants requested that they be left in the same room so they could continue socializing. Lily (Interview, March 14, 2018) explained, "when Julia came down that was really nice. She stayed in my room for an hour after you left until lunch time and then we went down to lunch together." Overall, Nintendo Wii

gameplay increased participant social functioning because it provided an outlet for older adults to interact and develop a relationship that may go beyond physical activity.

The increased social interaction and happiness expressed after participation indicates that this program increases participants' perceptions of their psychosocial health. As the program progressed participants began to verbally express their happiness and desire to play the Nintendo Wii with a partner. For example, during initial sessions with David he was not talkative, stuttering his words, and attempting to control his breathing. However, as sessions progressed he became more comfortable and started talking more, smiling, using facial and verbal expression, and expressing his happiness. During the interview David (Interview, March 14, 2018) explained, "I didn't know you from anything when we started but I know you a lot now and I really like it." Another example occurred during session six when Lily expressed that she was feeling sad and did not seem willing to engage in conversation with her partner. However, after one game of bowling on the Nintendo Wii she began talking and laughing with her partner, smiling, using facial expressions, and sitting with better posture. These results provide strong evidence for the positive influence of the Nintendo Wii on older adults' psychosocial health.

Research Question #3 – Inductive Analysis

I now report the overall findings pertaining to the third and final research question; namely, whether the motivational properties of both the Nintendo Wii and ACT increase participants' motivation to initiate and adhere to a physical activity program. The salient information and patterns related to ACT that are presented in this results chapter provide general consensus that the motivational properties of ACT play a part in increasing participants' motivation to initiate and adhere to a physical activity program. Specifically, examples were provided that demonstrate participants' understanding of ACT and their agreement with ACT principles; participants were

able to explain ACT in their own words and explain how they will attempt to live by the ACT principles of acceptance, mindfulness, and values-based action. During initial Nintendo Wii gameplay sessions, all participants exhibited nervousness and anxiety, which may have led to difficulties initiating participation and recurrent non-adherence. However, participants did not let negative feelings influence their actions and initiated Nintendo Wii gameplay in the face of these negative feelings. Through this example it is clear that understanding and attempting to live by ACT principles has motivated participants to initiate and adhere to a physical activity program.

The Nintendo Wii aspect of this research question directly relates to the motivational properties of the Nintendo Wii described in the literature review. Therefore, refer to ‘Research Question 3 – Deductive Analysis of Inductive Findings’ located in chapter five for a more complete discussion of how these findings relate to the research question; the main findings are briefly summarized in this section.

During Nintendo Wii gameplay sessions all participants enjoyed creating avatars that resembled themselves. Participants were observed laughing and having fun while creating these avatars and expressed excitement to use their avatars in a game. Participants also reacted positively to the encouraging music and commentary of every game; participants would hum along to music and respond to game commentary in a positive manner. Furthermore, during interviews all participants explained how Nintendo Wii games enabled them to participate in activities they once enjoyed, such as going bowling or to the golf course. Participating in activities they used to enjoy when they were younger and more physically capable promoted positive memories and feelings. Moreover, participants voiced that they had little choice in available programs at their residence and enjoyed having choices of multiple games to play on the Nintendo Wii. Having numerous game choices enabled participants to find and play a game

that is meaningful and fun, while limiting boredom. Finally, Julia and Lily displayed limited physical functionality, however both individuals were observed successfully and safely playing the Nintendo Wii. In sum, these collective findings provide evidence in favour of the motivating aspects of the Nintendo Wii on participants' physical activity participation and adherence.

Chapter 5 – Discussion and Conclusion

In this chapter, I discuss how the interview and observational field note data relate to the examined literature in the second chapter. I will present the research questions and the deductive analysis of interviews and observational field notes. I will also present the deductive analysis of inductive findings from chapter four. I will then examine and provide reasoning on how my findings support or contradict the literature. Finally, I will provide recommendations for future studies based on the results of this study.

Research Question #1 – Deductive Analysis

Relative to the first research question (What were aspects of this program that affected participants' willingness to participate in available programs?), existing literature reveals that when older adults relocate to a RCFE, they experience decreases in mental health due to the development of RSS (State of Wisconsin Board on Aging and Long Term Care, 2005) and increases in depression (Blazer, 2003; Djernes, 2006; Hybels & Blazer, 2003; Sawatzky et al., 2007) and anxiety (Bryant et al., 2009; Sawatzky et al., 2007). Although participants' mental health levels were not initially measured in this research, data analysis revealed that all participants experienced increased happiness after participation in the intervention. This increase in happiness may have developed due to me utilizing the ACT sessions to develop a caring relationship with participants. Through this relationship I was able to show respect for participants life-long experiences, which Laidlaw (2006) deems a necessary feature when attempting to promote adherence to therapy. Furthermore, due to research by Williams and Lord (1995) that reports decreases in psychosocial health act as a barrier to exercise initiation and adherence, the conclusion can be made that increased mental health achieved through this

program is a contributing factor to participants' increased willingness to participate in available programming.

According to the Canadian Institute for Health Information (2013), 46% of nursing home residents in Ontario, Manitoba, British Columbia, Nova Scotia, Newfoundland and Labrador, and Yukon reported limited to no social engagement. Lily and David each discussed limited social engagement during their respective interviews. Lily (Interview, March 14, 2018) explained, "a lot of people I see in here all they ever do is sleep or not talk to one another so it is very difficult to make new friends" and David (Interview, March 14, 2018) said, "I usually spend a lot of time in my room reading my books." In their research, Agmon et al. (2011), Chao et al. (2015), and Kahlbaugh et al. (2011) highlight that Nintendo Wii gameplay with a partner improves social engagement and decreases loneliness. Increased social engagement was observed in this research during Nintendo Wii gameplay because participants were continuously interacting with their partner or me. Additionally, developing a relationship with a partner during Nintendo Wii gameplay lead to increased social engagement outside of the program. Specifically, participants in this study began playing cards together on a regular basis and on one occasion after Nintendo Wii gameplay had ceased, Julia stayed in Lily's room to visit. The increase in social functioning experienced through participation in this program has the potential to improve psychosocial health so it does not act as a barrier to exercise initiation and adherence, as explained by Williams and Lord (1995). Consequently, participants should be more willing to participate in other available programming. An increased willingness to participate in other programming was discussed by Lily (Interview, March 14, 2018) when she explained she wanted to join the colouring club because "I know that Julia goes down sometimes and I would like to do it with her." Another plausible explanation for participants increased social engagement is the

social learning that occurred through the ACT sessions. More specifically, by learning how to accept negative language associated with social interaction, how to live in the present moment, and how to take action guided by their values, participants may have developed an increased openness to socially engage with others. In addition, due to the learning that occurred through ACT, participants may have been able to identify that they experienced positive feelings when interacting with me, which may have led them to seek additional opportunities for social engagement.

In the literature numerous authors acknowledge that initiating and adhering to a physical activity program is challenging for older individuals because expected pain and physical health issues act as barriers (Benjamin et al., 2014; Booth et al., 2000; Chen, 2010; Cohen-Mansfield et al., 2003; Lim & Taylor, 2005; Pender et al., 2006; Schutzer & Graves, 2004). During this program, initiation and continuous adherence to Nintendo Wii gameplay was not challenging for participants; participants were always willing and excited to participate. This may be due to the motivational properties of both the Nintendo Wii and ACT, which are discussed in the deductive analysis of question three. However, a case can be made that participants continually adhered to Nintendo Wii gameplay because participation did not cause further pain or discomfort. While observing participants play the Nintendo Wii I did not witness any pain, discomfort, injury, or safety issues. To date there is no literature available that reports injury through Nintendo Wii gameplay (Chao et al., 2013; Chao et al., 2015; Skjæret et al., 2016). Furthermore, I observed participants with physical health and functionality issues participate successfully in Nintendo Wii gameplay; this is explained in the salient information section. Therefore, it can be concluded that older adults may be more willing to participate in available programs that do not cause

increased pain or discomfort and allow individuals with limited functionality and physical health issues to successfully participate.

Research Question #1 - Deductive Analysis of Inductive Findings

In the literature Benjamin et al. (2009), Chen (2010), and Kalinowski et al. (2012) identify that the type and delivery of RCFE physical activity programs often act as barriers and deter older adults from participation. More specifically, Benjamin et al. (2014) provide insight that RCFE residents avoid participation in physical activity programs due to fear that they will not be able to keep pace with other participants. Although not explicitly stated in the literature, the insight by Benjamin et al. (2014) allow for the conclusion that RCFE residents perceive large physical activity groups as a barrier to participation and would rather participate alone or in small groups to avoid excessive amounts of peers. During interviews Julia and Lily discussed how they did not enjoy participating in physical activity in large groups and prefer to work one on one with a facilitator or in small groups. Julia explained that rather than becoming distracted by other participants, she enjoys physical activity where no one is around so she can focus on herself. Lily explained that when she participates in large groups she feels as though others are watching and judging her, which she does not enjoy; she would rather participate in physical activity in private. Although Clint and David did not state that they disliked participating in large groups, they both mentioned during interviews that they prefer to work one on one with me rather than in a large group.

In the literature numerous studies indicate that participation in physical activity is associated with social connectedness in RCFE-dwelling older adults (Adams et al., 2011; Chen et al., 2007; Stathi & Simey, 2007). Increased social connectedness was observed in all participants during Nintendo Wii gameplay because participants were very interested in

developing a relationship with me and other participants. They continually talked to me during every session, asked numerous questions, told multiple stories, and always thanked me for coming and asked when I was coming back. During his interview, David explained that he usually spends time in his room by himself, but really enjoys playing the Nintendo Wii and interacting with me. Additionally, when two participants participated in Nintendo Wii gameplay together, I observed all pairs develop a connection through conversation and encouragement. During Clint's interview he explained how he enjoyed the social connection and developing new friendships with other participants during Nintendo Wii gameplay. In addition, after a Nintendo Wii gameplay session where Julia and Lily participated together, Lily asked if she could join Julia at the colouring club. Although Lily did not provide reasoning as to why, the assumption can be made that Lily appreciated the newly formed relationship and wanted to connect socially with Julia in more than the Nintendo Wii gameplay environment. These findings correlate with research by Aranceta et al. (2001) because participation in Nintendo Wii physical activity improved the social relations of older adults.

During initial Nintendo Wii gameplay sessions, I observed all participants struggle while learning how to play the Nintendo Wii. Participants continuously relied on instruction during early sessions and progressed to requiring minimal guidance during the final sessions. During interviews, Julia, Lily, and David all acknowledged that they struggled to initially learn how to play the Nintendo Wii, however, explained that a patient facilitator made learning an enjoyable experience. In a study by Rosenberg et al. (2010), the authors identify that older adults aged 63 to 94 struggled during early Nintendo Wii gameplay sessions. However, by the end of the study participants had learned to play and reported that learning how to play was satisfying.

Furthermore, there is no literature available that discusses the effects a patient facilitator has on older adults attempting to participate in or learn a new physical activity.

In the literature Benjamin et al. (2014) explain the type and delivery of physical activity interventions offered at RCFEs often act as barriers to initiation and adherence. More specifically, RCFE residents in the study by Benjamin et al. (2014) reported that they do not participate in physical activity programs because they are boring. During interviews for this research all participants identified that they found physical activity classes at their residence boring, which deterred them from participation. Rather, all participants made it clear that they enjoy playing the Nintendo Wii as a means of physical activity because it is fun and takes their mind off the thought that they are physically exerting themselves. This finding correlates with literature by Rosenberg et al. (2010) which states that older adults enjoy participating in exergames because the games are fun and varied. Chao et al. (2015) explains that the Nintendo Wii is gaining popularity in long-term settings due to its numerous interactive features that allow the user to have a fun and enjoyable experience while being physically active.

Research Question #2 – Deductive Analysis

I now report results of the deductive analysis pertaining to the second research question (If and how this program affects participants' perceptions of their physical and psychosocial health). According to Crombie et al. (2004) adults aged 65 and over are the most sedentary age group in Canada. To achieve health benefits, the Canadian Society for Exercise Physiology (2012) recommends this age group engage in at least 150 minutes of moderate to vigorous aerobic physical activity per week that occurs in 10 minute intervals or more. Although participants were required to be physically active in order to play the Nintendo Wii, Julia, Lily, and Clint all indicated during interviews that their physical health did not change after

participation in this program. This is plausible because participants did not abide by the Canadian Society for Exercise Physiology's recommendation; participants in this program were not subjected to 150 minutes of physical activity per week in 10 minute intervals. Rather, weekly Nintendo Wii gameplay sessions were between 30 minutes and one hour in duration, and participants were physically active for approximately 10 seconds at a time while they performed a movement such as throwing a bowling ball. After these 10 seconds participants were sedentary for a period of time until it was their turn to perform another movement. Conversely, during his interview, David acknowledged that the program had increased his physical health in the form of increased arm range of motion. This is connected to the literature because there are a variety of studies that demonstrate how Nintendo Wii gameplay has increased the functional ability and range of motion of older adults' upper extremities (Esculier et al., 2012; Hsu et al., 2011; Laver et al., 2012; Mouawad et al., 2011).

In this study, gatekeepers chose participants due to their sedentary behaviour and limited social engagement. Research by Anderson (2001) demonstrates that social isolation can cause mental health problems such as depression, and Da Silva et al. (2012) explains how sedentary behaviour also increases symptoms of depression and anxiety. Although participants' mental health levels were not measured in this study, the research by Anderson (2001) and Da Silva et al. (2012) suggests that each participant may have been experiencing mental health issues before participation in this program. During interviews all participants mentioned that participation in this program increased their happiness and mental health levels, which correlates with the abundance of research that shows how mental health is improved through participation in physical activity (Bridle et al., 2012; King et al., 1993; Mura & Carta, 2013; Teixeira et al., 2013; Tsai et al., 2003; Wipfli et al., 2008).

In the literature, Chen et al. (2007) and Stathi & Simey (2007) connect RCFE-dwelling older adults' participation in physical activity to social connectedness. Agmon et al. (2011), Chao et al. (2015), and Kahlbaugh et al. (2011) provide research more specific to this study when they highlight that Nintendo Wii gameplay increases social engagement. This was observed in this study during Nintendo Wii gameplay because participants were continuously interacting and forming a relationship with one another. During his interview, Clint (Interview, March 14, 2018) explained, "I'm excited to keep playing the Wii and I can't wait to keep making new friends in here by playing it." Additionally, in the literature Sirven & Debrand (2008) and Zunzunegui et al. (2004) explain that physical activity leads to better self-perceived health. During interviews, all participants perceived that their social functioning had increased through participation in this study.

Research Question #2 – Deductive Analysis of Inductive Findings

There is a plethora of literature outlining the physical health benefits associated with Nintendo Wii gameplay in older adults. Agmon et al. (2011), Albores et al. (2013), Bainbridge et al. (2011), Chao et al. (2013), Drexler (2009), Esculier et al. (2012), Franco et al. (2012), Hsu et al. (2011), Joo et al. (2010), Jorgensen et al. (2013), Laver et al. (2012), Mouawad et al. (2011), Rendon et al. (2012), Saposnik et al. (2010), and Williams et al. (2011) and all present research which demonstrates that a Nintendo Wii gameplay intervention lead to physical health benefits in older adults. Although physical health was not measured in this research, three out of four participants perceived that their physical health did not improve after participation in the program. This finding contradicts the literature, however, David perceived that his arm range of motion had improved after the program. This correlates with literature by Hsu et al. (2011), Joo

et al. (2010), Mouawad et al. (2011), and Saposnik et al. (2010), which found that Nintendo Wii gameplay increased the functional ability and range of motion of older adults' upper extremities.

After analysis of observational field notes in this study it was concluded that when two RCFE residents participate in Nintendo Wii gameplay together, there is the potential for increased physical health improvement. Although physical health levels were not measured in this research, the data demonstrates that participants may use increased musculature in order to gain a competitive advantage over their peers, which has the potential to lead to further increases in physical health. This is a novel finding because there is no literature available that compares physical health benefits achieved through playing the Nintendo Wii alone or with others.

In the literature, there are numerous studies that conclude that physical activity interventions improve older adults mental health levels (Babyak et al., 2000; Blumenthal et al., 1999; Bridle et al., 2012; Fiske et al., 2009; King et al., 1993; Mura & Carta, 2013; Schmitz et al., 2004; Teixeira et al., 2013; Tsai et al., 2003; Wipfli et al., 2008). More specific to this research, numerous studies have proven that exergames improve the mental health levels of older adults (Albores et al., 2013; Kahlbaugh et al., 2011; Li et al., 2016; Meneghini et al., 2016; Rosenberg et al., 2010; Wollersheim et al., 2010). Additionally, a study by Roberts and Sedley (2016) concluded that a brief ACT intervention improved the mental health levels of an 89-year-old woman. Although mental health levels were not measured in this research, I observed all participants' happiness increase throughout the intervention. For example, as sessions progressed participants began to smile more often, use more expression, and verbally express their happiness. Moreover, during interviews participants attributed this increase in happiness to playing the Nintendo Wii and talking to me during ACT sessions, which validates findings in the literature. The argument could be made that this occurred due to participants getting to know me

better and becoming more comfortable, and ACT and Nintendo Wii gameplay provided an avenue for this to occur.

In the literature, Chen et al. (2007) and Stathi and Simey (2007) provide research evidence that physical activity provides an outlet for RCFE-dwelling older adults to interact with one another and form relationships. More specific to this research, Agmon et al. (2011), Chao et al. (2015), Esculier et al. (2012), and Kahlbaugh et al. (2011) explain that Nintendo Wii gameplay with a partner provides an outlet for a relationship to develop between partners. The development of new relationships was observed between participants in this study; participants continually talked to and encouraged one another during Nintendo Wii gameplay. Additionally, after playing the Nintendo Wii together, Julia and Lily requested that they be left in the same room to continue socializing. On another occasion, I witnessed all research participants take it upon themselves to organize a card game that they could all play together. Finally, Lily asked if she could join the colouring club because she knew that her Nintendo Wii gameplay partner, Julia, was involved in the colouring club. Furthermore, Fiori et al. (2006) explain that the positive feelings achieved after developing a relationship promote continued and additional adherence to physical activity because older adults recognize the potential of forming stronger or new relationships through participation. The aforementioned examples correlate with the literature and although participants may not have joined other physical activity programs, they did display an increased willingness to connect socially with their partners and participate in other activities at their RCFE.

Research Question #3 – Deductive Analysis of Inductive Findings

In the literature, Chao et al. (2015) stated that seeing oneself represented in a virtual environment as an avatar is very engaging and motivational. During Nintendo Wii gameplay

sessions I observed all participants enjoy creating avatars that resembled themselves. All participants were laughing and engaged when creating an avatar and expressed excitement when witnessing their avatar participate in games. Although participants did not speak as an avatar during interviews, these observations provide clarity that creating and using an avatar during Nintendo Wii gameplay has the potential to increase participants' motivation to initiate and adhere to a physical activity program.

Chao et al. (2015) discussed another motivational feature of the Nintendo Wii, which is encouraging commentaries and music during gameplay. During gameplay all participants reacted positively to this encouragement. More specifically, when shooting a good shot in bowling or golf, all participants reacted positively to the cheering and commentary; Julia and Clint would mimic the cheering to cheer for themselves, Lily would verbally respond to the commentary in a positive manner, and David would clap for himself. Furthermore, as sessions progressed and participants became more familiar with the music, I witnessed Julia, Lily, and Clint hum along to the music on multiple occasions. It is clear that participants enjoyed the commentaries and music during gameplay, and it is assumed that this enjoyment will increase participants' motivation to continually initiate and adhere to gameplay.

Kahlbaugh et al. (2011) discussed how Nintendo Wii gameplay enables older adults to participate in activities that were once enjoyed and through this experience they may develop an interest in participating in increased activities at their RCFE. During interviews, all participants explained how they were able to participate in activities they once enjoyed. David (Interview, March 14, 2018) stated, "playing the Wii is amazing you don't have to go anywhere and can still do things that I used to do I can even bowl in my room." Participating in activities that were once enjoyed lead to the emergence of positive memories and feelings. For example, during her

interview, Julia (Interview, March 14, 2018) explained, “bowling really reminds me of [my husband] and makes me really happy.” Although participants did not discuss how the emergence of positive memories and feelings affected their motivation for participation, it is clear that a positive feedback loop has the potential to motivate participants to initiate and adhere to a physical activity program. Specifically, when participants engage in Nintendo Wii gameplay, the positive memories and feelings experienced increase the likelihood of initiating and adhering to the physical activity program in attempt to continually achieve positive memories and feelings.

In the literature, Rosenberg et al. (2010) explain that due to the hundreds of games available for the Nintendo Wii, participants have choices in what activity they want to participate in, which increases enjoyment and motivation for play. During gameplay sessions participants voiced their curiosity and interest to experience all available gaming options. After speaking with participants, it was clear that they had little choice in available programming at their residence as the same programs were offered on a weekly basis. In the literature, multiple authors acknowledge that the type and delivery of RCFE physical activity programs negatively affect older adults' initiation and adherence (Benjamin et al., 2009; Chen, 2010; Costello et al., 2011; Kalinowski et al., 2012). These authors explain that program developers do not consult RCFE residents to develop individualized programs or educate residents on the intended benefits of the program, and thus, the same, meaningless programs are often offered to residents. Performing the same activities significantly limits the possibility of an individual finding an activity they enjoy and often leads to boredom. Lily (Interview, March 14, 2018) explained, “if I do too much of one thing it gets boring after a while. That’s why I like this game you have. I can always choose new games to play that keep me excited to do something new.” Moreover, when individuals do not have choice in activities, David (Interview, March 14, 2018) explained that

the activities sometimes feel pointless. Therefore, the plethora of available Nintendo Wii games provide individuals with countless options to find a game they enjoy and find meaningful, and the ability to pick something new if they become bored. In sum, if older individuals are provided numerous options for physical activity and the ability to choose, they will be more motivated to initiate and adhere to available programs.

In the literature, Agmon et al. (2011) and Hsu et al. (2011) explained that only small movements of the upper extremities are required to play the Nintendo Wii and the user has the ability to play while sitting or standing; these features enable even the most physically compromised individuals to play successfully. During gameplay sessions I observed two physically compromised individuals, Julia and Lily, participate successfully in Nintendo Wii gameplay. If Julia and Lily were unable to sit while playing or large movements were required to play, they would have been unable to participate. Thus, it is clear that these properties of the Nintendo Wii have the ability to motivate participants to initiate and adhere to a physical activity program regardless of their functionality.

To date, there is no known literature available that reports an older adult being injured during Nintendo Wii gameplay, and thus, it is considered a safe form of physical activity (Chao et al., 2013; Chao et al., 2015; Skjæret et al., 2016). During Nintendo Wii gameplay no participants complained of feeling unsafe or showed any signs of unsafe gameplay, such as losing balance or injury. During his interview, in reference to Nintendo Wii gameplay, David (Interview, March 14, 2018) stated, “all I was doing mostly was moving my arm it’s not like I’m going to knock off my head or anything (laughs).” Literature by Hays (2002) reports that older adults relocate to a RCFE for the increased safety these residences provide and there is an abundance of literature that reports older adults experience initiation and adherence difficulties

due to fear of increased physical health issues or pain (Benjamin et al., 2014; Booth et al., 2000; Chen, 2010; Cohen-Mansfield et al., 2003; Lim & Taylor, 2005; Schutzer & Graves, 2004).

Therefore, because participants did not feel unsafe during participation or experience increased pain or physical health issues, it is assumed they will have increased motivation to initiate and adhere to this physical activity program.

In addition to the motivational properties of the Nintendo Wii, a plausible explanation for the outcomes observed in this study, namely, participants increased motivation for and participation in physical activity and increased social engagement, is the learning that occurred through the ACT sessions. It is assumed that participants entered this research in a psychologically inflexible state because they did not display an openness to participate in available programming or social engagement. However, participating in ACT sessions and learning how to live a psychologically flexible life, may have promoted participants newfound openness to the aforementioned experiences. More specifically, participants learning of the ACT principles of acceptance, contact with the present moment, and values-based action will be expanded on to demonstrate how these principles may have promoted an openness to physical activity initiation and adherence, and social engagement.

During ACT sessions participants may have learned how to limit experiential avoidance and accept negative language associated with participation in physical activity and social engagement. More specifically, it is plausible that participants learned how to allow negative, internal language associated with participation in physical activity and social engagement, to come naturally and be present in the body. Rather than struggling with this negative language, such as “I’m too old for physical activity and it will only cause me increased pain,” it is plausible that participants dropped their struggle with such language. Consequently, participants may have

been able to place their focus on participating in Nintendo Wii gameplay and socially interacting with others, which is why these outcomes were observed in this study.

A reason why participants may have been able to accept their negative language associated with participation in physical activity and social engagement is due to the possibility that they learned how to make use of mindfulness strategies. Understanding and utilizing mindfulness strategies taught during the ACT sessions may have enabled participants to pay attention to negative thoughts associated with physical activity and social engagement. By paying attention to these negative thoughts, participants may have been in a better position to accept them. Furthermore, participants potential utilization of mindfulness strategies learned during the ACT sessions may have led to them not focusing on negative experiences they had with physical activity or social engagement in the past. Rather, they may have been able to place focus on the present moment and use their energy to initiate physical activity participation and social engagement. If this is the case, it is clear that participants understanding of contacting the present moment may have promoted their increased willingness to participate in physical activity and social engagement.

Due to participants learning how to accept negative language associated with physical activity and social engagement, and learning how to contact the present moment, it is plausible that they were in a better position to engage in values-based action. Through the aforementioned learning and activities that occurred during the ACT sessions, which enabled participants to identify and speak about their values, they may have been empowered to act on their personal values. More specifically, because participants developed a connection between their values and engagement in Nintendo Wii gameplay, they may have been more capable of making the choice to continually engage in Nintendo Wii gameplay and social opportunities. Overall, it is plausible

that participants engagement in ACT sessions and the learning that occurred during these sessions may have promoted their initiation in and engagement to Nintendo Wii gameplay and social engagement throughout this study.

Deductive Analysis of Salient Information and Patterns

Due to salient information and patterns being novel findings that are not connected to the research questions in this study, there is a lack of literature associated with these findings. Therefore, for the purpose of this section, only findings that connect to the literature will be discussed.

During Nintendo Wii gameplay in this study, participants with low levels of functionality were observed successfully playing the Nintendo Wii. More specifically, Lily was confined to a wheelchair and had very little arm functionality, so much so that she could not manipulate the Nintendo Wii remote with one hand. However, Lily was able to hold the Nintendo Wii remote in one hand and use her other hand to control and make small movements with the remote in order to successfully play. This correlates with findings in the literature because Agmon et al. (2011) explain that the Nintendo Wii can be played while sitting and Hsu et al. (2010) explain that only small movements of the upper extremities are needed to play Nintendo Wii. Through these findings the authors acknowledge that individuals with limited physical functionality can successfully play the Nintendo Wii, which is exactly what was observed in this study.

In the literature, Kahlbaugh et al. (2011) state that Nintendo Wii gameplay provides older adults with a way to participate in activities that they enjoyed earlier in life but are no longer physically capable of performing. The authors argue that when older adults participate in activities on the Nintendo Wii that were enjoyed earlier in life, they experience greater benefits than other activities such as walking or arts and crafts. Although this research did not seek to

determine if Nintendo Wii gameplay elicits superior benefits to activities such as walking or arts and crafts, all participants identified that Nintendo Wii gameplay closely resembles real-life activities. All participants thoroughly enjoyed participating in these real-life activities in a virtual Nintendo Wii gameplay environment and explained that participation elicited positive memories and feelings.

In the literature, Rosenberg et al. (2010) explain that older adults are sometimes nervous before their initial encounter with Nintendo Wii gameplay, however, the nervousness does not persist very long, and participants are satisfied with gameplay. Prior to the Nintendo Wii gameplay aspect of this study I witnessed exactly what Rosenberg et al. (2010) described. For example, David was visibly nervous as he was attempting to control his breathing and stuttering his words, and the other three participants voiced their nervousness. However, after the first session, participants voiced how much they enjoyed gameplay and I did not observe any signs of nervousness for the remainder of the intervention. Moreover, Rosenberg et al. (2010) explain that older adults experienced some difficulty during gameplay, but they continually saw progress in their gameplay abilities with practice. This finding correlates with findings from this study because participants often experienced difficulties being consistent, but with practice they continually improved. I observed the Nintendo Wii gameplay ability of all participants drastically improve throughout the intervention.

Positionality

Due to the multiple roles performed throughout this study, and my past life experiences and resulting beliefs, I was unable to conduct this research in an objective and unbiased manner. As a researcher, it was important to understand how my significant involvement in this study, my

past experiences, and biases may have affected how I approached this research and interpreted the findings (Creswell, 2013).

In this study I performed multiple roles throughout the research process including designing and facilitating the intervention, collecting the data while acting as a participant-observer, and analyzing the collected data. During the intervention I acted as a participant-observer because I facilitated the ACT and Nintendo Wii gameplay sessions while observing and creating retrospective fieldnotes in order to collect data. In addition, during facilitation of the intervention I developed a relationship with all participants. Due to the multiple roles I served in this study, I have influenced and had an impact on the results. More specifically, because I designed the intervention utilized in this study, I entered the research with a bias that it would successfully motivate participants to initiate and adhere to a physical activity program, and positively affect participants' perceptions of their physical health, mental health, and social functioning. This bias may have influenced data collection and how I interpreted the collected data during analysis. In addition, I am aware that the relationship I developed with participants may have positively affected their motivation to participate in the intervention; it is possible that participants continually participated because they enjoyed developing a relationship with me. To strengthen this study, I recommend having a third party facilitate the intervention and collect data. This would decrease the likelihood of the researcher developing a relationship with the participants and allow the researcher to analyze data that he or she did not collect. Thus, limiting researcher bias and influence on the results of the study.

During and prior to this research I have been continuously involved in a wide range of physical activities; I consider myself a very physically active individual. I grew up participating in physical activity on a daily basis; these physical activities included baseball, basketball,

hockey, football, squash, physical education class at school, cross country running, and physical training, to name a few. Whenever an opportunity arose to participate in physical activity, I almost always initiated participation and during this research my engagement in physical activity remained unchanged. Due to these life experiences I have personally witnessed the benefits physical activity has on physical health, mental health, and social functioning. In addition, during my undergraduate degree in kinesiology and while performing research related to this study, I became familiar with research highlighting the benefits of participation in physical activity. In combination, these life experiences have developed my bias that physical activity provides an optimal outlet to increase physical health, mental health, and social functioning in a wide range of populations. Conducting research with this bias may have influenced the interpretation of the data in this study and the resulting outcomes.

Throughout my teenage years, I often experienced negative thoughts and feelings before engaging in different activities; I often attached truth to these negative thoughts and feelings, while making attempts to rid them. In order to rid these negative thoughts and feelings, I limited my participation in a wide range of activities on some occasions. As I grew older, I began to utilize the ACT principles of acceptance, contact with the present moment, and values-based action in order to deal with these negative thoughts and feelings so my participation in different activities was no longer limited. Due to using ACT in my own life and personally witnessing this therapy's motivational effect to promote engagement in different activities, I developed a bias that ACT would work to motivate older adults to initiate and adhere to Nintendo Wii gameplay. Overall, I recognize that a limitation of this study is that I conducted this research with the bias that the intervention I designed and facilitated would successfully motivate participants to initiate

and adhere to the intervention. I am aware that my multiple roles in this study and my biases have influenced data collection, interpretations of the data, and resulting outcomes.

Recommendations for Future Studies

The intervention featured in this study is a novel method to promote RCFE-dwelling older adults' participation in physical activity programs. Although there is literature available that employs Nintendo Wii gameplay to increase older adults' physical activity participation, there are no known studies that rely on ACT to accomplish this feat. Additionally, there is no literature available that utilizes ACT in combination with Nintendo Wii gameplay to increase RCFE-dwelling older adults' physical activity participation. Therefore, I suggest a larger scale study be performed, similar to this one, that involves more RCFE-dwelling older adults. Researching an increased number of participants has the potential to lead to new findings and strengthen the validity of findings from this research. Although I had hoped to perform a larger scale study, I was bound by time constraints for this graduate research and was unable to travel to other RCFEs in Canada and around the world. I relied on collecting data from one location, which left only four participants that fit the selection criteria. I believe that researching an increased number of participants would be beneficial to developing new knowledge in this area.

There is no literature available that utilizes ACT to promote older adults' initiation and adherence to physical activity. This study is the first of its kind, however, during interviews the Nintendo Wii gameplay aspect of this intervention was a main topic of conversation; participants spoke little about ACT during interviews. I believe this is the case because participants had engaged in six weeks of Nintendo gameplay prior to interviews being conducted. It is possible and likely that most participants forgot about key aspects of the ACT intervention that had occurred weeks earlier, and therefore, did not speak on it much during interviews. Due to this, I

would suggest that future research be performed on strictly an ACT intervention without the distraction of any other type of intervention. This would provide valuable data to determine the effect that ACT alone has on participants' initiation and adherence to physical activity. Another possibility for future research is utilizing the same intervention featured in this study, but interviewing participants after they have completed the ACT portion of the intervention and before they begin Nintendo Wii gameplay. I believe this would provide valuable data on the effect of ACT because the intervention will be fresh in the minds of participants.

There is an abundance of research that identifies the physical health, mental health, and social functioning benefits associated with older adults' participation in physical activity and Nintendo Wii gameplay. There is also research that acknowledges how an ACT intervention improves the mental health levels of older adults. In this study, subjective participant feedback was relied on to determine if the intervention affected the aforementioned constructs, however, a quasi-experimental research design was not performed; hence, I suggest that such study be performed wherein participants are lead through a similar intervention and physical health, mental health, and social functioning levels are measured at baseline and post-intervention. For example, to determine if the intervention has improved physical health, participants' shoulder range of motion could be measured before and after the intervention to determine how it was affected by the intervention and how much. Similar baseline and post-intervention measures could be conducted for mental health and social functioning. Baseline and post-intervention testing would elicit objective data that would add to findings from this study and increase knowledge in this field.

Recommendations for Practitioners and Future Researchers

I believe there is a need and great opportunity for future researchers to implement and research this intervention or similar interventions with RCFE-dwelling older adults. Future researchers could apply the aforementioned recommendations in order to address the limitations of this study while tailoring their study to their own specific aims. Future researchers should be aware that conducting this research required significant effort and patience due to the multiple components in it, so they should be prepared to spend ample time researching and contacting RCFE residences and building appropriate relationships with the potential participants. For example, researchers may also find it particularly challenging to find a RCFE residence that is willing to allow an outsider to come into the residence to conduct a study such as this. If a residence gives permission for this research to occur the research team should be aware that they will have to complete numerous steps before being granted access (e.g., being interviewed, police screening clearance, tuberculosis testing, and ensuring vaccinations are up to date). If access is granted, researchers will need to exert much effort into identifying potential participants and gaining consent to participate in research. This will likely involve multiple steps including meeting with gatekeepers to explain specific information on potential participants, identifying potential participants on your own, and then appropriately overcoming potential barriers towards working with older adults who may view them as outsiders that do not have their best interests in mind. Finally, researchers will have to attend the host site on a consistent basis for an extended period of time in order to facilitate the intervention and collect data for the research.

When the research has concluded it is important not to suddenly terminate all contact with participants and the research site. This is important in order to demonstrate to the

participants and research site that you genuinely care about them, rather than view them only as a means to conduct research. If contact is suddenly terminated it may lead to a plethora of negative outcomes in participants, such as the negative emotions associated with feeling sad, angry, or exploited. Moreover, sudden termination of all contact may limit the RCFEs willingness to consider outcomes of your research or utilize your recommendations for future practice. After I finished facilitating the intervention in this study, I visited the research site on a bi-weekly basis to connect with participants and to volunteer for various activities at the RCFE. I also continued to volunteer at the research site and visited participants on a regular basis until I moved to a different country approximately six months later. In sum, although there is a need for future research in this area, researchers should be aware of the significant time, effort, and need for appropriate relationships required to complete research of this type.

Through conducting this research and exploring the findings, I have learned numerous lessons that could benefit practitioners and future researchers working with older adults residing in RCFEs. To begin, I recommend that practitioners work to show RCFE-dwelling older adults that they genuinely care about them. I recognize that this may be no easy task due to the demands of any given workday; however, I recommend that practitioners set aside some time in their daily schedule to do some little things that appear to be meaningful in the lives of older adults. This could take the form of, for example, demonstrating to older adults that you are curious about their lives by asking numerous questions when you see them. Through this research I recognized that older adults tend to thoroughly enjoy talking about their family so questions about family can help to facilitate ample discussion with them. To achieve this, you can observe their room and ask questions about individuals who they have pictures of, or you can simply ask about their spouse, children, or any other important people in their life. Moreover, as

you see the older adult study participants on a consistent basis, I recommend observing them in order to gauge their interests and hobbies that they perform regularly (e.g., knitting, colouring, or television or online programming they prefer to watch). Asking questions about older adults' interests can also facilitate discussion and may encourage them to speak about their hobbies and interests from earlier in their lives, which will further enhance conversation. Overall, if practitioners work to engage in conversation with older adults it may create an avenue for the development of an authentic, caring relationship, which can help in their physical, mental, or social functioning.

Other recommendations for increasing older adults' initiation and engagement in available activities are to limit the size of activity groups, be patient and supportive during engagement, and provide activities that are enjoyable. If an authentic relationship is developed with older adults, it should be easier for a practitioner to determine what each enjoys based on the knowledge of their interests gained through observation and conversation. Through this research, I have learned that older adults tend not to enjoy participating in activities in large groups as they favor working in small groups or one-on-one with the facilitator. Consequently, practitioners should try to work one-on-one with older adults in order to promote their engagement in any given activity. If this is not possible or feasible, they should strive to develop small activity groups by grouping individuals with similar functionality and interests, as this may increase the potential for equal participation of all group members, limit the possibility of a specific individual dominating an activity, and facilitate the potential for developing meaningful relationships between participants. Finally, I recommend that practitioners be patient and supportive during older adults' engagement in different activities as not doing so may discourage individuals from initiation and adherence. Alternatively, doing so may motivate them to keep

engaging and working hard to be successful, which may increase the possibility that they will adhere to an activity even if it is difficult.

My final recommendation for practitioners working to increase older adults' initiation and engagement in available activities is to provide older adults with choice and do not force or coerce them to participate. Rather, guide older adults to make the choice of participating. Although this feat sounds difficult, I recommend utilizing the ACT principles of acceptance, contact with the present moment, and values-based action described in this thesis in order to promote individuals' psychological flexibility and to help them develop and understand their values. If a practitioner is able to connect participation in an activity to an individual's values, I believe that making the choice to pursue values-based action is much more likely. Providing a choice on what activity they want to participate in could enhance their feeling of autonomy and is more likely if the researcher is aware of their interests and has developed a collegial relationship with them.

Conclusion

To conclude, exploring program aspects that affected participants' willingness to participate in programs available at their residence (research question #1), determining if and how the program affected participants' perceptions of their physical and psychosocial health (research question #2), and investigating whether the motivational properties of the program increased participants' motivation to initiate and adhere to a physical activity program (research question #3), led to some insightful findings. After analyzing all findings related to research question one, it appears that RCFE-dwelling older adults are more likely to participate in physical activity programs available at their residence if they are able to work one on one with the facilitator or in small groups, if the facilitator is patient and works with them through their

struggles, if the facilitator demonstrates that they genuinely care about the participants in order to develop an authentic relationship, and if the programs are fun and do not feel like exercise.

Secondly, after analyzing all findings related to research question two, I conclude that the program had little to no effect on participants' physical health. However, participation in the program did improve the mental health levels and social functioning of all participants; participants were happier after the program and developed a relationship with me and their Nintendo Wii gameplay partner, which also lead to increased socialization outside the program.

Finally, after analyzing all findings related to research question three, I conclude that the motivational properties of the program appeared to increase participants' motivation to initiate and adhere to a physical activity program. More specifically, the learning that occurred during ACT sessions and the motivational properties of ACT, ability to create an avatar that resembles oneself, commentaries and music, participating in activities that were once enjoyed in a simulated environment, having choice on different games to play, participating successfully although physically compromised, and feeling safe during Nintendo Wii gameplay increased participants' motivation to initiate and adhere to the program. Due to these conclusions I recommend the use of an ACT intervention in combination with Nintendo Wii gameplay to increase RCFE-dwelling older adults' participation in physical activity. Although there is future research needed to strengthen knowledge in this area, participating in this type of program will likely provide older adults an outlet to reap the abundance of positive benefits associated with physical activity participation. Consequently, this will lead to increases in quality of life and promote successful aging for all older adults residing in a RCFE.

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Brock University
 Research Ethics Office
 Tel: 905-688-5550 ext. 3035
 Email: reb@brocku.ca

Bioscience Research Ethics Board

Certificate of Ethics Clearance for Human Participant Research

DATE: April 18, 2018
 PRINCIPAL INVESTIGATOR: LODEWYK, Ken - Kinesiology
 FILE: 17-080 - LODEWYK
 TYPE: Masters Thesis/Project STUDENT: Carson Morse
 SUPERVISOR: Ken Lodewyk
 TITLE: Investigating the Value of Acceptance and Commitment Therapy and Nintendo Wii Physical Activity for Seniors

ETHICS CLEARANCE GRANTED

Type of Clearance: MODIFICATION Expiry Date: 11/1/2018

The Brock University Bioscience Research Ethics Board has reviewed the above named research proposal and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri-Council Policy Statement.

Modification: Now collecting age.

The Tri-Council Policy Statement requires that ongoing research be monitored by, at a minimum, an annual report. Should your project extend beyond the expiry date, you are required to submit a Renewal form before **11/1/2018**. Continued clearance is contingent on timely submission of reports.

To comply with the Tri-Council Policy Statement, you must also submit a final report upon completion of your project. All report forms can be found on the Research Ethics web page at <http://www.brocku.ca/research/policies-and-forms/research-forms>.

In addition, throughout your research, you must report promptly to the REB:

- a) Changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
- b) All adverse and/or unanticipated experiences or events that may have real or potential unfavourable implications for participants;
- c) New information that may adversely affect the safety of the participants or the conduct of the study;
- d) Any changes in your source of funding or new funding to a previously unfunded project.

We wish you success with your research.

Approved:

Stephen Cheung, Chair
 Bioscience Research Ethics Board

Note: Brock University is accountable for the research carried out in its own jurisdiction or under its auspices and may refuse certain research even though the REB has found it ethically acceptable.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and clearance of those facilities or institutions are obtained and filed with the REB prior to the initiation of research at that site.

Informed Consent

Project Title: Investigating the Value of Acceptance and Commitment Therapy and Nintendo Wii Physical Activity for Older Adults

Principal Student Investigator:
Carson Morse,
Graduate Student
Faculty of Applied Health Sciences
Brock University
cm10cj@brocku.ca
289-696-5549

Faculty Supervisor:
Dr. Ken Lodewyk,
Associate Professor
Department of Kinesiology
Brock University
klodewyk@brocku.ca
905-688-5550 Ext. 5220

INVITATION

You are invited to participate in a study that involves research. The purpose of this study is to explore the experiences and outcomes that older adults living in a long-term care home have with Acceptance and Commitment Therapy and a Nintendo Wii-based physical activity program.

WHAT'S INVOLVED

As a potential participant, you will be asked to agree to participate in this study by signing an informed consent form. By signing this informed consent form you agree to participate in all aspects of this eight-week study, including: 1) three one-on-one sessions with the researcher focused on Acceptance and Commitment Therapy; 2) one one-on-one training session with the researcher to learn about and develop your ability to play the Nintendo Wii; 3) five sessions with another research participant and the researcher, where the researcher leads you through a Nintendo Wii-based physical activity program; 4) one interview with the researcher, lasting approximately one hour in duration. The interview will take place face-to-face in a private, confidential location that you are comfortable with; 5) continuous observation by the researcher during participation in all components of the study. All components of this study will take place in the long-term care home that you reside at.

During the three Acceptance and Commitment therapy sessions, the researcher will attempt to help you develop motivation for participation in the Nintendo Wii-based physical activity program. The researcher recognizes that making a change and doing something new, such as beginning a new physical activity program, may generate negative and uncomfortable thoughts and feelings, which may prevent you from participating. However, through Acceptance and Commitment therapy the researcher will attempt to promote your personal peace with these thoughts and feelings, increase your ability to live in the present moment, and help you identify and understand what is personally valuable so you are ready and willing to participate in a Nintendo Wii-based physical activity program; the researcher hopes to align your personal values with participation in Nintendo Wii-based physical activity. During this therapy you will be lead through exercises focused on mindfulness, acceptance, and values identification.

During the first of six Nintendo Wii-based physical activity sessions, the researcher will work with you one-on-one in attempt to develop and improve your ability to play the Nintendo Wii. The researcher will provide you with a verbal and visual explanation of the Wii Remote (the remote used to play the Nintendo Wii), a demonstration on how to properly play a Nintendo Wii game, and will then allow you to play, while providing tips and feedback to improve your ability. During the five remaining Nintendo Wii-based physical activity sessions, the researcher will set the Nintendo Wii up for you, and will allow you to play it freely with another research participant. The researcher will provide you choice on what game you would like to play; you will have the option to choose a different game at any point throughout each session. During all Nintendo Wii-based physical activity sessions the researcher will monitor you and explain that you should participate at your own pace and not overdo it; if you begin feeling bodily stress that is threatening or frightening, you should cease participation immediately. The researcher will also be available to answer any questions or help you with any struggles that arise, and will provide you the option of sitting on a chair while playing, if you wish to do so. Only games that allow you to sit down or continue to use any assistive equipment you require will be available for selection. During these sessions you will be required to wear certain attire for your safety. More specifically, you must wear clothes that are comfortable and allow for easy body movements (e.g., no tight fitting clothes) and clothes that are not too long or loose fitting (e.g., no gowns). You must also wear shoes suitable for physical activity (e.g., shoes that fit, have flat, non-skid soles, good heel support, and a cushioned arch that's not too high or thick).

During the interview, you will be asked questions regarding your experience while participating in Acceptance and Commitment Therapy and the Nintendo Wii-based physical activity program. General questions will include what you found memorable about the program, what you disliked about the program, if and how the program has affected your physical, mental, and social health, and if the properties of the program increase your motivation to participate in this program and other programming available at your residence that is not related to this research.

During all components of the study the researcher will observe you and make notes based on things such as your body language, physical fitness, and functionality (e.g., endurance, agility, and range of motion).

POTENTIAL BENEFITS AND RISKS

If you participate in this research, you may experience various direct benefits from your involvement. More specifically, after the Acceptance and Commitment Therapy component of this study, we anticipate that you will be ready and willing to participate in Nintendo Wii-based physical activity. Therefore, we anticipate that you will experience the benefit of focusing your time, energy, and effort on living a values-based life, which should provide you with a more rich, full, and meaningful life. You should also be able to take what you learn through Acceptance and Commitment Therapy, and use it in other situations throughout life so you can attempt to live the best life possible under any given circumstance. In addition, through participation in Nintendo Wii-based physical activity,

we anticipate that you will experience a variety of physical health, mental health, and social functioning benefits. More specifically, we anticipate that you may experience physical benefits such as decreased pain, weakness, and stiffness in upper extremity muscles, which may act to improve your physical functioning. If you learn to adequately play the Nintendo Wii, you may experience mental health benefits such as increased positive emotions and positive changes in self-perception due to your success. Older adults often believe they are incapable of performing physical activity, however, after successful participation in the Nintendo Wii-based physical activity program, we anticipate that your false beliefs will disappear, which might develop your readiness to participate in other recreation and leisure or physical activity programs. We anticipate that positive emotions will be further exacerbated if and when you develop a relationship with another research participant through interaction during Nintendo Wii gameplay; developing a relationship with the researcher through all components of this study may also increase positive emotions. In addition to the physical health, mental health, and social functioning benefits, we anticipate that you will help improve knowledge regarding the potential value of programs featuring Acceptance and Commitment Therapy and Nintendo Wii-based physical activity, which should enhance this type of intervention for the increasing number of older adults living in long-term care homes.

Although we anticipate numerous benefits due to participation in this study, there are also physical risks associated with Nintendo Wii-based physical activity because you will be required to physically exert yourself in order to participate. You may experience physical risks, such as an injury during participation or soreness following participation. Dizziness or chest pain may also occur, however, it is highly unlikely because you will not be performing high intensity physical activity – you will only need to use very small upper body movements to manipulate the Nintendo Wii Remote and you may sit down while playing. If you do experience any physical risks, you will have access to on-site health care professionals that will assist you in adequately dealing with this physical harm. Overall, Nintendo Wii- based physical activity does not pose a physical risk greater than other physical activity programs available at the research site.

There is a psychological risk associated with the Acceptance and Commitment Therapy portion of this study because it is possible that some of the questions and activities may make you feel uncomfortable. You are free to decline participation in any aspect of Acceptance and Commitment Therapy and we can connect you with someone at Terrace Lodge if you want to discuss these feelings further. In addition, you may develop negative thoughts and feelings, such as nervousness, associated with participation in the Nintendo Wii-based physical activity program. This risk will be minimized because the researcher will provide you with tips and feedback in attempt to develop and improve your ability to play. The researcher will also work alone with you while you are learning how to play the Nintendo Wii during the first session, which will eliminate judgment by other participants.

There is a social risk associated with this research because you will lose your privacy when you leave your bedroom to participate in all components of this study. However, this risk is minimal because your privacy will be ensured when you enter the private

room where the research is conducted. Furthermore, during the Acceptance and Commitment Therapy portion of this study, you will share personal information, which may lead to some embarrassment if you believe the researcher is judging you. To manage this risk the researcher will lead these sessions with compassion, empathy, and respect for your current situation, and at no point will the researcher judge you. In addition, because you were selected for this research due to the fact that you are not physically active, do not participate in available recreation and leisure programming, and have limited social interaction with others, you may be concerned about a potential loss of status or reputation. However, because you will have already been seen as displaying these characteristics before the research started, there should be no judgment placed on you – participating in this research may improve your reputation because you will be making a positive life change.

CONFIDENTIALITY

Your identity and access to the data collected will only be available to Carson Morse (Principal Student Investigator) and Dr. Ken Lodewyk (Faculty Supervisor). Your name will not appear in the study, as pseudonyms (a made-up, fake name) will be used in place of your real name. However, with your permission, your age, anonymous quotations you provide during the interview and observations made during the eight sessions of the intervention may be used. If you do not want your age included in the study results you are not obligated to complete that section on this form; if you choose not to include your age there will be no consequences. Data collected during this study will be stored on the researcher's password protected personal computer and in a locked cabinet in the researcher's home. Data will be deleted and shredded immediately following the completion of the study.

VOLUNTARY PARTICIPATION

Participation in this study is completely voluntary and you have the ability to withdraw your participation at any time, for any reason, with no consequences. Further, you are not obligated to do anything that makes you feel uncomfortable throughout the duration of the study, and you may decline to answer any interview questions or participate in any component of the study.

PUBLICATION OF RESULTS

Results of this study may be published in professional and scholarly journals, and may be presented at various conferences. At the conclusion of this study, Carson Morse (the Principal Student Investigator), will hold a private meeting with you to provide feedback on the study by verbally discussing and providing a hard copy of the research questions and results. If you have additional questions after this meeting, Carson can be reached by phone at 289-696-5549 or by e-mail at cm10cj@brocku.ca

CONTACT INFORMATION AND ETHICS CLEARANCE

This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University (File #17-080). If you have any questions or concerns about this study or require further information, please contact either the Principal Student Investigator or the Faculty Supervisor using the contact information provided above. If

you have any comments or concerns about your rights as a research participant, please contact the Brock University Research Ethics Office at 905-688-5550 Ext. 3035, reb@brocku.ca.

CONSENT FORM

I have read and understood all relevant information pertaining to the study described above and agree to participate in this study. I have had the opportunity to receive any additional details I wanted to know about the study and understand that I may continue to ask questions in the future. I understand that I may withdraw from participation at any time, with no negative consequences.

Name: _____

Age (optional): _____

Signature: _____

Preferred Pseudonym: _____

Date: _____

Appendix B: Interview Guide

1. What are the things that stand in the way of you participating in physical activity or exercise programs at your residence?
2. How relevant is what we did during ACT to you? Is it something you might use in the future?
3. What do you find memorable about the ACT portion of this program?
 - a. What did you dislike, if anything, about the ACT portion?
4. What do you find memorable about the Nintendo Wii portion of this program?
 - a. What did you dislike, if anything, about the Nintendo Wii portion?
5. What is your opinion of using the Nintendo Wii remote to play the games?
6. What else about any aspect of the program would you like to comment on, if anything?
7. What about this program, if anything, has made you consider joining other programs available at your residence?
8. Give your physical health, before you started the program, a rating out of 5 and explain this rating.
 - a. Give your physical health, after you completed the program, a rating out of 5 and explain this rating.
9. Give your mental health, before you started the program, a rating out of 5 and explain this rating.
 - a. Give your mental health, after you completed the program, a rating out of 5 and explain this rating.
10. Give your social functioning, before you started the program, a rating out of 5 and explain this rating.
 - a. Give your social functioning, after you completed this program, a rating out of 5 and explain this rating.
11. Describe your emotions on the days you knew I was coming to lead you through the program or when I approached you to ask if you wanted to participate.
12. Is there anything I haven't asked about, that you would like to speak on?

Appendix C: Acceptance and Commitment Therapy Protocol

****Italicized script* = *What I will said during each session****

Session #1

1. Introduce the session/program – what I am trying to accomplish and why this might be important to the participants.
 - a. *Welcome to the ACT portion of this program. I am so pleased that you have decided to join me for this program and for my research. I really believe that we can make our own lives better by being slightly more engaged in activities and making sure that we have some fun in daily life – so that is what we are going to be doing throughout this program. We are going to be doing some talking about things that are important to you and we are going to be learning how to play some fun games on the Nintendo Wii.*
2. Give a brief overview of ACT and then use my own personal anxiety due to my position as a novice ACT therapist as an example.
 - a. *ACT is not like traditional, Western therapy – ACT’s focus is not on reducing or eliminating negative symptoms; ACT will not attempt to determine negative symptoms you are experiencing, for example, diagnosing you with depression or anxiety, and then attempt to fix them. Rather, ACT is focused on creating a rich and meaningful life, while accepting the pain that inevitably goes with it. More specifically, ACT acknowledges that any kind of change will generate negative and uncomfortable thoughts and feelings (use examples), however, these negative and uncomfortable thoughts and feelings will only stop you from making a change if you allow them to take control of your actions (use examples). Therefore, ACT attempts to promote personal peace with these negative and uncomfortable thoughts and feelings that often arise, and attempts to help you identify and understand what is personally valuable so you can take control of your actions even when these negative and uncomfortable thoughts and feelings emerge. Essentially, ACT does not attempt to decrease the frequency or severity of these negative and uncomfortable thoughts and feelings, but rather, attempts to reduce your struggle to control them so you can use your energy on increasing engagement in what is valuable and meaningful to you, rather than using your energy in attempt to rid your negative and uncomfortable thoughts and feelings. In order to help you handle negative and uncomfortable thoughts and feelings so you are in a place to take action based on your values, ACT attempts to increase your ability to live in the present moment with full awareness and openness to your experience.*
 - b. *An example of this is the personal anxiety that I am feeling at this very moment due to my position as a novice ACT therapist; this is my first time leading ACT and it is a big change for me. If my anxiety could speak, it would say: “you can’t do this, run!” and if I listened to it I would run out of here right now, which means that I wouldn’t be here right now to meet you and do something I value, which is helping others. I really feel that leading you through this research will produce results that have the potential to greatly improve programs available to seniors, such as yourself, and this is something I value very deeply, so I haven’t given in and listened to my anxiety. Instead, I have accepted that I am anxious and rather than worrying about it I will place my energy on leading you through this program because it is very valuable to me.*
3. *So, how do we go about changing our relationship with our own negative and uncomfortable thoughts and feelings, so that we can do the things that might make our lives better? Well, there are a few parts – and today we are going to focus on imagination, being fully present in the current moment, and thinking about what is most important to you.*
4. Brief Mindfulness exercise à Imagery of “Best Self”
 - a. *I would like you to close your eyes and to think about a time in your life when you were the best version of yourself.*
 - b. *You can open your eyes now. When you were your “best self” what types of things were you doing? What got you to your “best self”?*

- c. *When you were making decisions that got you to your “best self”, what helped you make those decisions? Why were you engaging in those things? → Lead participant to answer based on their values*
- i. *Did you make these decisions based on what you wanted to stand for in life? Based on your heart’s deepest desires for the way you wanted to behave, live, and interact with the world?*
 - ii. *If a response is given that is unrelated to values it will be my job to identify the underlying values of that decision so the participant acknowledges that deep down this is why they made certain decisions that lead them to their “best self”.*
5. Values Discussion
- a. *One of the things that we know about humans is that we are really motivated towards things that are important to us. But sometimes, we don’t think about these important values very much – so we are going to do a bit of that today, in fact, we already have and now we will continue to do so.*
 - b. *Values-based action is the action taken by an individual in order to live a rich, full, and meaningful life. Therefore, values are principles that help guide and motivate individuals throughout life so they are able to live meaningfully. A well-known ACT therapist defines values as “our heart’s deepest desires for the way we want to interact with the world, other people, and ourselves. They’re what we want to stand for in life, how we want to behave, what sort of person we want to be, and what sort of strengths and qualities we want to develop.” Overall, values give direction to an individual’s life and are personal aspirations for how one would like to live life; values identify what one strives to exemplify.*
 - c. *Can you see how your values lead you to be your “best self” and how good of a feeling that was? Even though you may currently be in a situation that is less than ideal for you, you still have a choice to live the best life possible and experience the good feelings that come with it, so why not pursue your values during our time together? What do you think?*
6. Discuss negative self-talk that interferes with pursuing values-based actions
- a. *As we discussed earlier, it is well known that when people attempt to make changes and pursue their values (because obviously changes need to be made to work towards these values), they experience negative and uncomfortable thoughts and feelings. Often times, individuals in this situation place full attention on these thoughts and feelings and believe they are true; they will also attempt to control this language and do everything they can to ensure it fades as quickly as it emerged – people who do this are obviously in no place to live by their values and consequently will experience unfavourable outcomes such as depression or anxiety because they are not living in the moment and in accordance with the person they truly want to be (because they are too focused on these negative and uncomfortable thoughts and feelings).*
 - b. *For example, right now if I were to task some residents in this facility with making a change to start participating in a physical activity program, such as playing the Nintendo Wii, these residents would give numerous reasons as to why they should not make this change and participate. For example, they would say things like, “I’m too old”; “I’m in too much pain”; “My body cannot handle playing the Nintendo Wii”; and, “I don’t care if playing the Nintendo Wii is good for me, I don’t like it”. Residents that say these types of things really believe that these negative thoughts are true and will allow these thoughts to influence their behaviour, even if doing so negatively affects their life because they will not be living true to their values (because values are often implicit in recreation and leisure activities, such as the Nintendo Wii). For example, the thought of being too old or in too much pain will have a large impact on residents’ behaviour and they will often stay in bed and not participate in available programs to avoid their imagined pain, even if they are fully capable of getting up. Consequently, they will not experience the benefits associated with participating in an activity that promotes their values and they will experience unfavourable outcomes such as depression or loneliness, because they are not doing anything meaningful. Do you understand this example? Do you have any questions?*

7. Conclusion of Session

- a. *What strikes you about today?*
- b. *What will you take away and think about after today's session? How might this information be helpful to you?* → Before I tell participants the goals of the session, I will ask them to tell me what they have learned.
- c. *I want you to understand:*
 1. *What ACT aims to accomplish → ACT attempts to help you be fully present in the here and now so you can achieve personal peace with negative and uncomfortable thoughts and feelings that often arise when making a change. If you can reduce the struggle with uncomfortable thoughts and feelings, you will have more energy to take meaningful, values-based action, which will greatly improve your life.*
 2. *What values are → Our heart's deepest desires for the way we want to interact with the world, other people, and ourselves. They're what we want to stand for in life, how we want to behave, what sort of person we want to be, what sort of strengths and qualities we want to develop." Values give direction to an individuals' life and are personal aspirations for how one would like to live life.*
 3. *Understand that everyone experiences negative self-talk when making a change and understand that if you live in the present moment you can overcome it so you can live a values-based life, which will allow you to live a great life.*

Session #2

1. Remind participants of the goals of the program again.
 - a. *What ACT aims to accomplish → ACT attempts to help you be fully present in the here and now so you can achieve personal peace with negative and uncomfortable thoughts and feelings that often arise when making a change. If you can reduce the struggle with uncomfortable thoughts and feelings, you will have more energy to take meaningful, values-based action, which will greatly improve your life.*
2. *What do you recall about the last session?*
 - a. *Remember that values are our heart's deepest desires for the way we want to interact with the world, other people, and ourselves. They're what we want to stand for in life, how we want to behave, what sort of person we want to be, what sort of strengths and qualities we want to develop." Values give direction to an individuals' life and are personal aspirations for how one would like to live life.*
 - b. *Understand that everyone experiences negative self-talk when making a change and understand that if you live in the present moment you can overcome it so you can live a values-based life, which will allow you to live a great life.*
3. Introduce the purpose of this session.
 - a. *We will be discussing things more in-depth today and there are a few things that I want you to learn from this session, with the main focus being:*
 1. *Understanding and learning how to live in the present moment so you are able to do the things that make your life more rich, full, and meaningful*
 2. *Understand the difference between goals and values and then identify your own personal values*
 3. *Understand and learn how to accept negative and uncomfortable thoughts and feelings so you are freed up and have the energy to take values-based actions*
4. Mindfulness exercise – Mindfulness of the Breath (Harris, 2009, p. 160 - 161)
 - a. *I invite you to sit with your feet flat on the floor and your back straight, and close your eyes.*
 - b. *Bring your attention to your breathing, and observe it as if you're a curious scientist who has never encountered breathing before. (Pause 5 seconds.)*
 - c. *Notice the air as it comes in through your nostrils....how it's slightly warmer as it comes*

outand slightly cooler as it goes in. Notice the subtle rise and fall of your shoulders. (Pause 5 seconds.)

- d. *And the gentle rise and fall of your rib cage. (Pause 5 seconds.)*
- e. *And the soothing rise and fall of your abdomen. (Pause 5 seconds.)*
- f. *Fix your attention on one of these areas, whichever you prefer: on the breath moving in and out of the nostrils, on the rising and falling of the rib cage or the abdomen. (Pause 5 seconds.)*
- g. *Keep your attention on this spot, noticing the movement – in and out – of the breath. (Pause 20 seconds.)*
- h. *Whatever feelings, urges or sensations arise, whether pleasant or unpleasant, gently acknowledge them, as if nodding your head at people passing by you on the street. (Pause 5 seconds.)*
- i. *Gently acknowledge their presence and let them be. (Pause 5 seconds.)*
- j. *Allow them to come and go as they please, and keep your attention on the breath. (Pause 20 seconds.)*
- k. *Whatever thoughts, images, or memories arise, whether comfortable or uncomfortable, simply acknowledge them and allow them to be ...Let them come and go as they please, and keep your attention on the breath. (Pause 20 seconds.)*
- l. *From time to time, your attention will wander as you get caught up in your thoughts. Each time this happens, notice what distracted you, then bring your attention back to the breath. (Pause 20 seconds.)*
- m. *No matter how often you drift off, whether a hundred times or a thousand – you aim is simply to notice what distracted you and to refocus on your breath. (Pause 10 seconds.)*
- n. *Again and again and again, you'll drift off into your thoughts. This is normal and natural and happens to everyone. Our minds naturally distract us from what we are doing. So each time you realize your attention has wandered, gently acknowledge it, notice what distracted you and return you attention to the breath. (Pause 20 seconds.)*
- o. *If frustration, boredom, anxiety, impatience, or other feelings arise, simply acknowledge them, and maintain your focus on the breath (Pause 20 seconds.)*
- p. *No matter how often your attention wanders gently acknowledge it, note what distracted you, and then refocus on your breath. (Pause 10 seconds.)*
- q. *And when you are ready, bring yourself back to the room and open your eyes.*
 1. *How do you feel after that activity?*
 2. *That activity was used to show you how to contact and live in the present moment. Although life occurs only in the present moment, people often focus their attention on the past or imagined future, which does nothing good for them. For example, when I task a resident living here with participating in a recreation and leisure program, such as playing the Nintendo Wii, they often become overwhelmed with anxiety because they are making a change (remember how we discussed this before?). If we are able to do activities like this and live in the present moment we are able to see how this anxiety affects us, and we will be more capable of making room for this anxiety in our body so we can pursue values- based actions, such as participating in recreation and leisure programs, which promote a more rich, full, and meaningful life.*
 3. *If you would like to practice mindfulness activities such as this one, I would be happy to provide you with some resources you can use on your own time.*

5. Differentiate Goals/Values

- a. *So you know how we have been talking about values? Could you explain to me what values are?*
- b. *If participant can't answer à Our heart's deepest desires for the way we want to interact with the world, other people, and ourselves. They're what we want to stand for in life, how we want to behave, what sort of person we want to be, what sort of strengths and qualities we want to develop." Values give direction to an individuals' life and are personal aspirations for how one would like to live life*
- c. *Could you give me an example of a value? à If participant confuses goals with values, for*

example, if the participant responds with a goal such as the ideal partner, occupation, or body they desire, I need to develop values that are rooted in these goals, so I could say something like:

1. *“If this goal were achieved: what would you do differently? How would you act differently? How would you behave differently in your relationships or social life? What would it show you stand for?”*
 2. *A goal is the desired result or possible outcome that a person envisions, plans, and commits to achieve*
 - d. To provide a good example highlighting the difference between values and goals I could explain the difference between getting married and being loving:
 1. *To help you understand the difference between values and goals we will discuss the difference between getting married and being loving. Being loving is a value because it is ongoing and at any point in time one can choose to act on or neglect this value. In contrast, getting married is a goal because it can be completed or achieved; one can still achieve this goal even if he or she disregards the value of being loving.*
 2. *Is this something you understand?*
 3. *In sum, values occur in the present moment; at any point in time one can choose to act on or neglect their values, whereas goals are in the future*
6. Develop personal values à Fill in ‘Coat of Arms’
- a. *Now we are going to build on this understanding of values and develop some of your own. If you could please have a look at this ‘Coat of Arms’ and fill it out, that would be great.*
 - b. ‘Coat of Arms’ – shield divided into four sections.

Section 1: What are the qualities/characteristics about yourself that others value most? (kindness, courage, sense of justice, etc.)? What are the three words/qualities you would like to be associated with you?

Section 2: What makes you laugh, feel happy, brings contentment?

Section 3: What is important to you in a friend or family member? What do you want from others? What do you give to others in friendship?

Section 4: What are the accomplishments in your life of which you are most proud? Family, work, leisure, travel, etc.
7. View ‘Coat of Arms’
- a. *When you look at this ‘Coat of Arms’, which feels closest to you now? How close is this to the life you’re living now? Feels most uncomfortable?...Best question = How much are you living your life in accordance to this ‘Coat of Arms’?*
 1. I will be very curious when asking questions about the ‘Coat of Arms’
 - b. Questions will get a negative response (i.e., “I haven’t been living my life in accordance to this ‘Coat of Arms’”)
 - c. If questions do not get a negative response, I will question why the participant spends little to no time participating in available programming at their residence, or why they have little interest and do not engage socially with others in the facility (participants were selected based on this). This questioning will hopefully have them recognize that they have not been living in accordance with the ‘Coat of Arms’.
8. Promote acceptance
- a. *Can you sense that you have not been living in accordance with your ‘Coat of Arms’ because you struggle with negative and uncomfortable thoughts and feelings when you attempt to live true to your values (even if you didn’t recognize that this was happening in the moment).*
 1. The participant should agree with this statement, as this is likely the case.
 2. If they do not agree with this statement I will ask them: *Why do you perceive that you haven’t been living in accordance with your ‘Coat of Arms’?* à I will ask this in attempt to help them understand that they haven’t been living true to their ‘Coat of Arms’ due to their struggle with negative and uncomfortable thoughts and feelings.
 - b. *By this point it is my hope that you understand that dropping the struggle with negative*

and uncomfortable thoughts and feelings, and developing an openness for these thoughts and feelings will provide you with more personal resources to focus on what is meaningful. You do not and should not believe that these negative and uncomfortable thoughts and feelings are true, but instead of struggling with these thoughts and feelings that are inherent to human nature, you should create space in your body for this negative language so it will have somewhere to go when it appears so you are more capable of focusing your time, energy, and effort on values-based action.

- c. *Now, if I were to ask you if you are ready to participate in a Nintendo Wii-based physical activity program, what would you say? Would it be negative? Would you have an excuse as to why you shouldn't participate?*
 1. If participant provides an excuse, have them write excuse on a piece of paper attached to a clipboard and proceed to step #9.
 2. If response is positive and participant is motivated and willing to participate in a Nintendo Wii-based physical activity program, I will explain that this is great and we will get to the Nintendo Wii next session because they are ready. However, in the meantime, I will show them an example of accepting negative and uncomfortable thoughts and feelings, so if they arise in the future the participant will be prepared to overcome them.
9. Pushing Against the Clipboard Metaph (Harris, 2009)
- a. Begin this exercise with the participant's excuse as to why they should not participate in a Nintendo Wii-based physical activity program written on a piece of paper attached to a clipboard.
 - b. *Now, I want you to imagine that the excuse you have written on this clipboard is the thought running through your head – this excuse is obviously in your thoughts because you wrote it down after I asked you if you were ready to participate in a Nintendo Wii-based physical activity program.*
 - c. *I'd like you to take hold of this excuse and grip it as tightly as you can so that I can't pull it away from you. (Participant grips it tightly).*
 - d. *Now I'd like you to hold it up in front of your face so you can't see me anymore – and bring it up so close to your face that it's almost touching your nose. (Participant holds the clipboard directly in front of his or her face, blocking his or her view of me and the surrounding room).*
 - e. *Now what's it like trying to have a conversation with me while you're all caught up in your thoughts and feelings? (Participant will say something like "it's very difficult")*
 - f. *Do you feel connected with me, engaged with me? Are you able to read the expressions on my face? If I were doing a song-and-dance routine right now, would you be able to see it? (Participant will say "no").*
 - g. *And what's your view of the room like, while you're all caught up in this stuff? (Participant will say that they can't see much other than the clipboard).*
 - h. *So while you're completely absorbed in your thoughts and feelings, you're missing out on a lot. You're disconnected from the world around you, and you're disconnected from me. Notice too, that while you're holding on tightly to this stuff, you can't do the things that make your life work. Check it out – grip the clipboard as tightly as you possible can. Now if I asked you to cuddle a baby, or hug the person you love, or participate in Nintendo Wii-based physical activity, could you do it? (Participant will say "no").*
 - i. *So while you're all caught up in this stuff, not only do you lose contact with the world around you and disconnect from your relationships, but you also become incapable of doing the things that make your life work. (Participant will agree).*
 - j. *Is it alright if I just drag my chair across so I'm sitting beside you? There's something else I want to demonstrate here. (Participant will agree and I will move my chair).*
 - k. *Could I have the clipboard back for a moment? Can I just check – you don't have any neck or shoulder problems do you? (If client says no, proceed to next step. If client says yes, I will ask them to pretend for the following steps).*
 - l. *Okay. I'm just checking because this involves a bit of physical exertion. What I'd like you to do is place both your hands flat on one side of the clipboard here, and I'm going to put my hands on the other side, and I'd like you to push the clipboard away from you. Push*

firmly, but don't push so hard you knock me over. (As participant tries to push the clipboard away, I will push back. The harder the participant pushes, the more I will lean into it).

- m. *And just keep pushing. You hate this stuff, right? You hate these thoughts and feelings. So push as hard as you can – try to make them go away. (I will maintain the struggle so that the participant keeps pushing while I push back).*
- n. *So here you are, trying very hard to push away this painful thought. You've been doing this for a while now, and are they going anywhere? Sure you're keeping them at arm's length, but what's the cost to you? How does it feel in your shoulders?*
- o. *If I asked you now to cuddle a baby, or hug the person you love, or play the Nintendo Wii, could you do it? (Participant will say "no")*
- p. *Do you feel a bit closed in or cut off while trying to have a conversation with me? (Participant will say "yes". I will now stop resisting on the clipboard, ease off the pressure, and take the clipboard back).*
- q. *Okay, now let's try something else. Is it okay if I just place the clipboard on your lap, and we just let it sit there? (The participant will agree and I will place the clipboard on his or her lap).*
- r. *Now isn't that a lot less effort? How are your shoulders now? (Participant will agree that it is much better).*
- s. *Notice that you are now free to invest your energy in doing something constructive. If I asked you to cuddle a baby, or hug the person you love, or participate in Nintendo Wii-based physical activity – now you could do it right? (Participant will agree)*
- t. *And what's it like to have a conversation with me now as opposed to doing this? (I will mime pushing the clipboard away and holding the clipboard in front of my face and the participant will say it is much easier).*
- u. *Do you feel more engaged with me? Can you read my face now? (Participant will say "yes").*
- v. *Notice too, you now have a clear view of the room around you. You can take it all in. If I started doing a song-and-dance routine, you'd be able to see it. However, the clipboard will still be on your lap and obviously you don't want these negative and uncomfortable thoughts and feelings near you at all. Who would want these negative and uncomfortable thoughts and feelings? But notice, now this stuff is having much less impact on you.*
- w. *This exercise is all about showing you how to handle and deal more effectively with painful thoughts and feelings that arise when you attempt to do certain things, such as play the Nintendo Wii – in such a way that they have much less impact and influence over you. So instead of doing this (I will pick up the clipboard and hold it in front of my face) or this (I will mime pushing the clipboard away), you can do this (I will drop the clipboard into my lap and let go of it). And notice, this not only allows you to be connected with the world around you and to engage in what you're doing, but it also frees you up to take effective action. When you're no longer struggling with this stuff, or absorbed in it, or holding on to it, you are free. So now you can put your energy into doing things that improve your quality of life – like hugging people, or talking with others, or playing the Nintendo Wii. How does that sound to you? Do you understand what I mean?*
 1. *You should understand that dropping the struggle with negative and uncomfortable thoughts and feelings, and developing an openness for these thoughts and feelings will provide you with more personal resources to focus on what is meaningful. You do not and should not believe that these negative and uncomfortable thoughts and feelings are true, but instead of struggling with these thoughts and feelings that are inherent to human nature, you should create space in your body for this negative language so it will have somewhere to go when it appears so you are more capable of focusing your time, energy, and effort on values-based action.*

10. Conclusion of Session

- a. *What strikes you about today?*
- b. *What will you take away and think about after today's session? How might this*

information be helpful to you? → Before I tell participants the goals of the session, I will ask them to tell me what they have learned.

- c. *I want you to understand:*
 1. *Although life occurs only in the present moment, people often focus their attention on the past or imagined future, which does nothing good for them. For example, when I task a resident living here with participating in a recreation and leisure program, such as playing the Nintendo Wii, they often become overwhelmed with anxiety because they are making a change. If we are able to live in the present moment we are able to see how this anxiety affects us, and we will be more capable of making room for this anxiety in our body so we can pursue values-based actions, such as participating in recreation and leisure programs, which promote a more rich, full, and meaningful life.*
 2. *The difference between goals and values → **A value is** Our heart's deepest desires for the way we want to interact with the world, other people, and ourselves. They're what we want to stand for in life, how we want to behave, what sort of person we want to be, what sort of strengths and qualities we want to develop." Values give direction to an individuals' life and are personal aspirations for how one would like to live life. **A goal is** the desired result or possible outcome that a person envisions, plans, and commits to achieve. **Remember** values are ongoing and at any point in time one can choose to act on or neglect their values. In contrast, goals can be completed or achieved; one can still achieve a goal even if they disregard their values.*

Session #3

1. Mindfulness exercise → Loving-Kindness for Ourselves
 - a. *Please find a comfortable position sitting down. Letting your eyes close, fully or partially. Taking a few deep breaths to settle into your body and into the present moment.*
 - b. *Putting your hand over your heart, or wherever it is comforting and soothing, as a reminder that you are bringing not only awareness, but loving awareness, to your experience and to yourself.*
 - c. *After a while, feeling your breath where you notice it most easily. Feeling your body breath in and out, and when your attention wanders, noticing the gentle movement of your breath once again.*
 - d. *Then gently releasing your focus on the breath, or continuing to have a background awareness of your breath as you begin offering yourself words of kindness and compassion, over and over ...words that you need to hear, words you can savor.*
 - i. *If you already have phrases that are meaningful to you, please use these.*
 - ii. *If you are new to meditating with phrases, please open your heart and mind to what you need to hear – words of wisdom and compassion that speak to you in the deepest way.*
 - e. *Opening your heart to these words, whispering them gently into your own ear, again and again.*
 - f. *Perhaps hearing the words from the inside, allowing them to resonate with you.*
 - g. *Allowing the words to take up space, to fill your being, if only for this one moment.*
 - h. *Whenever you notice that your mind has wandered, refreshing your aim by feeling the sensations in your body. Coming home to your own body. And then feeling the importance of your words. Coming home to kindness.*
 - i. *Finally, releasing the phrases and resting quietly in your own body.*
 - j. *Gently opening your eyes.*
2. Overview of goals of ACT program
 - a. *Okay, so what we've been building towards through this program is to foster your motivation for and willingness to participate in Nintendo Wii- based physical activity,*

based on what you have learned throughout each session. More specifically, to this point I hope you have learned and understood:

- i. **ACCEPTANCE:**
 1. *Which involves understanding that negative and uncomfortable thoughts and feelings arise in the face of change. Acceptance is allowing these negative and uncomfortable thoughts and feelings to come naturally and be present in the body because they do nothing good for you. Dropping the struggle with negative and uncomfortable thoughts and feelings and developing an openness for them in your body will allow you to focus your energy on what's meaningful to you rather than worrying about negative thoughts that do not matter.*
 - ii. **MINDFULNESS/BEING IN THE PRESENT MOMENT:**
 1. *Which is paying attention in a particular way – on purpose, in the present moment, and nonjudgmentally. Doing this will allow you to identify what is actually occurring in the present so you will not worry about the past or imagined future, which will enable you to act effectively and live a more rich, fulfilling, and values-based life.*
 - iii. **VALUES-BASED ACTION:**
 1. *Remember values are our hearts deepest desires for the way we want to interact with the world, other people, and ourselves. They are what we want to stand for in life, how we want to behave, and what sort of person we want to be. Taking action based on your values will allow you to live in a way that is meaningful, which will significantly improve your life.*
- b. *Do you understand all of these things? Is there anything you need me to clarify? Do you have any additional questions?*
3. Connect ACT/personal values to participation in a Nintendo Wii-based physical activity program
 - a. Before this session I will review participant's 'Coat of Arms' and attempt to connect their values to participation in the Nintendo Wii-based physical activity program. For example, if a participant values friendships, I will explain to them that through participation in the Nintendo Wii-based physical activity program they will develop friendships. I will explain to the participant that they will hopefully develop a great relationship with me, as I lead them through the program, and there is also the potential that they develop a relationship with the other participant that they are playing the Nintendo Wii with. In addition, they may develop better relationships with their family, for example, they will be able to play the Nintendo Wii with their grandchildren – having fun and interacting while participating will surely improve their relationship with their grandchildren.
 - b. If I am unable to connect participant values to participation à I will tell the participant that I hope they value fun, laughter, excitement, etc. These are all embedded in Nintendo Wii-based physical activity, so the participant can participate in the program to achieve these things so they can live a more rich and full life, while hopefully connecting the program with their values. In addition, if the participant puts what he or she has learned through ACT into action, even if the Nintendo Wii doesn't connect with their values, they will be practicing and improving their ability to be fully present in the here and now so they can achieve personal peace with uncomfortable and negative thoughts and feelings and take values-based action towards things other than Nintendo Wii-based physical activity.
 4. Proceed to Nintendo Wii-based physical activity program