

FACILITATING PHYSICALLY ACTIVE IDENTITY DEVELOPMENT IN OLDER  
WOMEN

by

Kathleen Nevin Hall

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## DEDICATION

This dissertation is dedicated to the older women who told me that physical activity made a significant difference in their health.

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## ABSTRACT

Physical activity (PA) is beneficial for older women, yet, many older women are physically inactive. One way to motivate older women to become physically active is through physically active identity development. This study tested an intervention to see if physically active identity development could be facilitated, and if a facilitated physically active identity resulted in increased PA. A quasi-experimental pre-test post-test design was used with a convenience sample of 43 older women. Data analyses compared those who completed the study versus those who did not complete the study and those assigned to the intervention versus the attention-control group. Those who did not complete the study (N=22) had significantly higher walking frequency ( $p=.023$ ) and significantly lower duration of sitting ( $p=.000$ ). Among those who participated in the intervention (N=12) or attention-control (N=9) activities, there were no significant differences in physically active identities or PA at the end of the nine-week study period. Therefore, the study's two hypotheses were not supported. Significant associations were noted between physically active identity measures and health status ( $p=.039$ ), ego-resiliency ( $p=.040$ ,  $p=.016$ ), general fear of performing PA ( $p=.024$ ), and access to PA ( $p=.017$ ). Limitations of the study include the high risk of error in the statistical conclusions due to low statistical power, the limitations of the sample, limitations of the intervention itself, and the failure to track subjects longitudinally. Implications for nursing education, practice, and research are discussed. Recommendations for future studies were suggested.

## CHAPTER ONE: INTRODUCTION

Health experts agree that physical activity (PA) is beneficial for the health of older women (Chodzko-Zajko, et al., 2009). Yet, the majority of older women in the United States (US) are not sufficiently physically active to realize the health benefits [Centers for Disease Control & Prevention (CDC), 2010a]. As a result, they often experience negative health consequences including the development and worsening of chronic conditions (Bull, et al., 2004; Vuori, 2004). While PA is contraindicated for a small minority of older women, the vast majority can benefit from PA (Chodzko-Zajko, et al., 2009). Therefore, strategies must be employed to increase older women's PA.

Prior research has identified several factors that contribute to older women's decisions to become physically active. The factors most often identified include personal beliefs (Rosenstock, 1974; Ajzen & Madden, 1986; Bandura, 1999a, 1999b; Boekaerts, Pintrich, & Zeidner, 2000; Prochaska, Velicer, DiClemente, & Fava, 1988), socio-cultural and environmental norms (Ajzen & Madden, 1986; Bandura, 1999a, 1999b; Boekaerts, et al., 2000; Prochaska, et al., 1988), and self-efficacy beliefs and expectations (Bandura, 1999a, 1999b; Boekaerts, et al., 2000; Prochaska, et al., 1988). Recent research (Kearney & O'Sullivan, 2003) suggests that in order for a new behavior to be adopted and maintained over time, one's identity must shift to include the new behavior. This appears to be true for many health promoting behaviors (Kearney & O'Sullivan, 2003), including PA (Medina, 1996).

While performing PA is necessary to develop a physically active identity, it can take up to ten years before a physically active identity develops (Medina, 1996). Yet, older women cannot wait up to ten years for physically active identities to develop. The longer older women

remain physically inactive, the more likely they are to develop chronic conditions (Booth & Lees, 2007). Facilitating the development of physically active identities might help increase adoption and long-term continuation of PA in older women so that this cohort can realize the health benefits associated with PA.

No studies to this author's knowledge have tested interventions that facilitate the process of physically active identity development. Therefore, it is the purpose of this study to test a theory-based intervention to facilitate physically active identity development in a sample of older women. Older women were chosen because older adults are the least active of all age groups and older women are less physically active than older men (CDC, 2010a). In order to understand the study's purpose, the significance of the problem of physical inactivity for older women, prior research on motivating PA in older women, the study's purpose, and the definitions of study concepts are discussed.

### **Significance of the Problem: Physically Inactive Older Women**

Physical inactivity is a significant problem for older women because it contributes to negative health consequences, including higher all-cause mortality rates and the development and worsening of chronic conditions [Physical Activity Guidelines Advisory Committee (PAGAC), 2008]. To understand the significance of the problem of physically inactive older women, the prevalence of physical inactivity in older women, the missed health benefits associated with PA, the consequences of physical inactivity are discussed.

### **Prevalence of Physical Inactivity in Older Women**

Prevalence identifies the level of burden of disease or health-related events on the population and represents new and pre-existing cases alive on a certain date [National Cancer

Institute (NCI), 2006]. The prevalence of Americans who participate in no leisure-time PA has remained relatively stable since 1988, accounting for roughly 25 to 30% of the population. The prevalence of physical inactivity is higher among older adults than other age groups and is *the* highest among older women (CDC, 2010a).

Only 39.3% of individuals aged 65 and older participate in the recommended amount of PA, the lowest of any age group. Approximately 32.7% of individuals aged 65 and older participate in no leisure-time PA during the past month, the highest percentage of any age group. Among older women aged 65 and older, only 35.9% participate in the recommended PA, compared with 44% of older men. Twenty-six percent of women aged 65 and older are completely inactive, compared with only 20.7% of men in the same age group (CDC, 2010a).

### **Health Benefits Associated with Physical Activity for Older Women**

Physical activity is an effective strategy to prevent the development of chronic conditions and to modify the health consequences of chronic conditions once those conditions are already acquired (Chodzko-Zajko, et al., 2009). The benefits of PA have been shown to occur in the following systems: cardiovascular, endocrine, gastrointestinal, immune, metabolic, muscular, neuro-cognitive, psychological, respiratory, and skeletal. These responses occur in both men and women, and among individuals of all ages [US Department of Health & Human Services (HHS), 2008]. A discussion of each system follows.

**Cardiovascular system.** Cardiovascular disease (CVD) is extremely common in older women, affecting 73.1% and 84.7% of women aged 60 to 79 and 80 and older, respectively (American Heart Association [AHA], 2010a). Common cardiovascular diseases (CVD) among older women include coronary artery disease (CAD), hypertension, and congestive heart failure

(CHF). CAD occurs when plaque builds up in the coronary arteries which supply blood to the heart. This results in arterial narrowing (atherosclerosis) and occlusion (complete blockage). Consequences of CAD include angina (chest pain/discomfort), heart failure, arrhythmias, and myocardial infarction (heart attack) (CDC, 2009a).

Hypertension is defined as elevated blood pressure (BP). It results from increased peripheral vascular resistance and aortic impedance (Applegate, 1999). It is considered a silent killer because it has no symptoms or warning signs (CDC, 2010b). Congestive heart failure (CHF) is defined as a failure of the heart muscle that results in a decreased ability to pump blood (Rich, 1999). It affects approximately 26% of older women and is the most common cause of hospitalization in individuals aged 65 and older (Aronow, 2006).

A strong inverse relationship exists between the amount of habitual PA performed and CHD and CVD morbidity and mortality (PAGAC, 2008). PA has been shown to reduce the incidence of cardiovascular diseases by reducing many of the risk factors associated with them. PA has been shown to improve cholesterol profiles, including improvements in total blood cholesterol levels and high density lipoprotein (HDL) subfraction profiles. PA increases the activity of lipoprotein lipase which plays a role in the removal of cholesterol from the blood. Together, these result in decreased plaque formation within the cardiovascular system (Thompson, et al., 2003). Regular aerobic PA has been shown to lower BP (Hamer, 2006) and appears to attenuate the age-related increases in arterial BP, thereby preventing the development of hypertension (Mazzeo & Tanaka, 2001).

Physical activity has been shown to modify cardiovascular disease once it has already been developed. PA-based cardiac rehabilitation programs reduce mortality rates in patients after

myocardial infarction by as much as one-third (Thompson, et al., 2003). Regular aerobic PA increases circulating HDLs which help remove low density lipoproteins (LDLs) from the blood. This reduces the amount of plaque formation and reduces one's risk for further blood vessel occlusion (Thompson, et al., 2003). Physical activity reduces BP at rest in older adults with elevated baseline readings, making it an effective treatment for hypertension as well. This appears to be true even if individuals have been inactive for most of their lives (Mazzeo & Tanaka, 2001). Physical activity, in conjunction with medical management, is an effective treatment strategy for CHF. Physical activity has been shown to improve the clinical symptoms of CHF, thereby improving quality of life and decreasing hospital admissions (Resnick, 2004).

**Endocrine system.** Prediabetes and diabetes mellitus type II (DM) are common endocrine problems in older women. Prediabetes is defined as a condition in which individuals have blood glucose levels higher than normal but not high enough to be classified as diabetes. In 2006, 35.4% of individuals aged 60 or older had prediabetes (CDC, 2007b). Diabetes mellitus type II usually begins as insulin resistance, defined as a disorder in which the cells do not use insulin properly. As the need for insulin increases, the pancreas gradually loses its ability to produce it, resulting in DM. Approximately 23% of adults aged 60 and older have DM (CDC, 2007b).

Physical activity of moderate intensity for 150 minutes per week has been shown to prevent DM (PAGAC, 2008). Physical activity has been shown to prevent the progress of prediabetes to DM by improving insulin sensitivity and reducing blood glucose levels. In individuals aged 60 and older, PA in conjunction with weight loss, decreases the percentage of those who progress to DM by 70% (CDC, 2007b). Dietary changes and PA have been found to

be effective for controlling DM as well. A single bout of moderate PA can affect glucose metabolism for up to 18 hours and repeated bouts of PA have a cumulative beneficial effect. Physical activity improves glycemic control and reduces visceral adipose tissue and plasma triglycerides in individuals with DM, even in the absence of weight loss (PAGAC, 2008, p. G3-13).

**Gastrointestinal system.** Constipation is a common complaint among older women and research indicates that the incidence of constipation increases with age (Dukas, Willett, & Giovannucci, 2003). Constipation is defined as a decreased frequency of defecation or an increase in the difficulty associated with defecation (Hall & Wiley, 1999). Yet, PA has been shown to decrease gastrointestinal transit time in middle aged and older women (DeSchryver, et al., 2005), thereby decreasing the incidence of constipation.

**Immune system.** The immune system is responsible for protecting individuals against infection, cancer, and autoimmune disorders. One's immune function declines as a normal consequence of aging (Murasko & Bernstein, 1999). This decline is evidenced by alterations in T cell activity (Burkle, et al., 2007), and an increase in circulating pro-inflammatory cytokines including plasma interleukin-6 (IL-6), tumor necrosis factor alpha (TNF $\alpha$ ), and c-reactive protein (CRP) (Colbert, et al., 2004).

Cancer is defined as a multitude of diseases in which abnormal cells divide without control and can invade nearby tissues (NCI, 2010). The occurrence of cancer increases with age and several cancers are highly prevalent in older women. The three most common types of cancers affecting women are breast, lung, and colon, affecting 119.3, 55.0, and 41.1 out of every 100,000 women respectively (CDC, 2010c).

Evidence suggests that long-term PA improves immune function (Pedersen & Hoffman-Goetz, 2000). This is evidenced by an increase in natural killer cell activity (Crist, et al., 1989). Natural killer cells help remove infectious and cancerous cells from circulation, thus assisting the prevention of infections and cancer (Pedersen & Hoffman-Goetz, 2000). Physical activity may also help maintain a healthy immune system by lowering pro-inflammatory markers (Colbert, et al., 2004).

Evidence from randomized controlled trials (RCTs) suggests that there is a moderate, inverse relationship between PA and cancers of the breast and colon. Individuals who perform moderate to vigorous intensity aerobic PA for approximately three to four hours per week have roughly a 30% reduction in colon cancer risk and a 20 to 40% reduction in breast cancer risk, compared to their physically inactive counterparts. There may also be a reduction of risk with lung (20%), endometrial (30%), and ovarian (20%) cancers based on epidemiological evidence (PAGAC, 2008).

**Metabolic system.** Metabolic abnormalities in older women include obesity and metabolic syndrome. Obesity is defined as a body mass index (body weight in kg/height in m<sup>2</sup>) of 30 or greater (CDC, 2010d). It occurs when energy intake exceeds bodily requirements (Singh & Rosenberg, 1999). Metabolic syndrome is a condition characterized by the presence of abdominal obesity, abnormal blood lipoprotein levels, hypertension, and insulin resistance (AHA, 2010b). The rates for obesity are at an all time high. Among older women aged 50 to 59, 30.3% are obese. Among women aged 60 to 69, the percentage increases to 32.3%. Among women aged 70 and older, 21% are obese (CDC, 2010e). The prevalence of metabolic syndrome in adults over the age of 50 is 43.5% (Alexander, Landsman, Teutsch, & Haffner, 2003).

Physical activity increases energy expenditure (Nelson, et al., 2007), increasing the metabolic rate by about 5% for up to 24 hours (Slack, 2006). Over time, PA improves body composition by decreasing body fat while increasing lean body mass. When combined with dietary intervention, PA is an effective strategy to decrease weight. Physical activity has been shown to be an effective treatment for the components of metabolic syndrome (fasting glucose, triglycerides, abdominal adiposity, and waist circumference) (PAGAC, 2008).

**Muscular system.** A common muscular problem among older women is sarcopenia, defined as age-related loss of muscle mass. Sarcopenia results in deficits in muscle strength, functional abilities, gait, and balance (PAGAC, 2008; Singh & Rosenberg, 1999). The rate of muscle loss increases such that muscle strength declines by about 15% per decade in the 6th and 7th decade and about 30% thereafter (Capodaglio, Edda, Facioli, & Saibene, 2007; Stessman, Hammerman-Rozenberg, Maaravi, & Cohen, 2002).

Physical activity has been shown to preserve and increase muscle mass in individuals of all ages. However, increases in muscle growth may be attenuated in old age. Nonetheless, evidence is clear that muscle strengthening benefits older adults. Physical activity interventions that emphasize high velocity, low resistance exercises appear to be good for improving muscle strength and power, both of which are critical to physical functioning in older adults (PAGAC, 2008).

**Neuro-cognitive system.** Cognition is defined as the processes involved in selecting, manipulating, and storing information derived from experiences and how these processes guide behavior (PAGAC, 2008). Cognitive impairment is defined as impairment in thinking and intellect and in one's ability to understand internal and external realities (Trzepacz & Norton,

1999). Cognitive impairment affects as many as 2.3 million older adults (Bernstein & Remsburg, 2007), often leaving them unable to live independently.

Dementia is defined as a loss of brain function thereby affecting memory, thinking, language, judgment, and behavior (Hoch, 2009). Alzheimer's disease is the most common form of dementia among older adults. It affects the frontal lobe of the brain that controls thought, memory, and language. As many as 5 million Americans suffer from Alzheimer's disease. Roughly 5 % of adults aged 65 to 74 have Alzheimer's disease, and nearly half of those aged 85 and older may have the disease (CDC, 2009b).

Mounting evidence suggests that PA delays the onset of cognitive decline commonly associated with aging. Evidence suggests that PA may preserve and improve cognitive function (Newson & Kemps, 2006) and may improve executive control processes (e.g. planning, scheduling, working memory, multi-tasking) (Kramer & Erickson, 2007). Physical activity appears to have a protective effect against dementia, particularly Alzheimer's type (PAGAC, 2008; Rovio, et al., 2005). Lastly, PA appears to improve aspects of cognitive function and reduce symptoms of dementia once dementia has already been diagnosed (PAGAC, 2008, p. G8-30).

**Psychological system.** Psychological health is an important component of overall health. Psychological conditions that are common in older women include anxiety and depression. The term anxiety is used to describe a set of disorders characterized by apprehensive or worrisome thoughts. Roughly 4% of women have anxiety disorders in the US (PAGAC, 2008). Depression is a term used to describe disorders that present with a depressed mood or a loss of interest or

pleasure in normal activities (PAGAC, 2008). Depression is commonly seen in older women, affecting as many as 20% of this population (Steffens, et al., 2000).

Physical activity appears to improve emotional well-being (Galper, et al., 2006; National Institute of Mental Health, 2007), improve health-related quality of life (HRQL) (Focht, Brawley, Rejeski, & Ambrosius, 2004), and reduce stress (Wilcox, et al., 2006) in older populations. Additionally, substantial evidence suggests that regular PA protects against the onset of depression and reduces depressive symptoms in people diagnosed with depression. This appears to be true regardless of age, sex, race, ethnicity, or presence of other chronic conditions (PAGAC, 2008). Evidence also suggests that regular PA protects against the onset of anxiety and lowers the symptoms associated with anxiety in those for whom the diagnosis has already been acquired. This appears to be true regardless of age or sex (PAGAC, 2008).

**Respiratory system.** Normal consequences of aging include a decrease in the number of lung capillaries and alveoli. Also affected by aging are lung compliance, volume, airflow, and diffusing capacity. In nonsmokers, these changes often do not result in clinically significant symptoms. In smokers, tobacco use results in airway inflammation, thereby accelerating these changes (Merck Manual of Geriatrics, 2006). Chronic obstructive pulmonary disease (COPD) refers to diseases of the lung that block airflow and result in breathing problems. COPD includes emphysema, chronic bronchitis, and sometimes asthma. COPD is a leading cause of death among older women and the primary cause of COPD in the US is tobacco smoking (Brown, Croft, Greenlund, & Giles, 2008).

High intensity PA has been shown to improve forced expiratory function, a measure of lung function and performance, in older adults aged 55 to 86 years (Amara, Koval, Paterson, &

Cunningham, 2001). Additionally, moderate to high levels of regular PA appear to be associated with a decrease in lung function decline and a lower risk of COPD in active smokers (Garcia-Aymerich, Lange, Benet, Schnohr, & Anto, 2007).

**Skeletal system.** Three skeletal conditions that commonly occur in older women are osteopenia, osteoporosis, and osteoarthritis (OA). Osteopenia is defined as decreased bone mineral density (BMD) between 1 and 2.5 standard deviations below the mean peak bone mass. Osteoporosis is defined as decreased BMD below that (Ott, 1999). Approximately 49% of women aged 50 and older have osteopenia of the femoral neck (Looker, Melton, Harris, Borrud, & Shepherd, 2010). Osteoarthritis refers to degenerative changes that occur in a joint. A combination of mechanical, cellular, and biochemical processes occur that lead to changes in the composition and mechanical properties of the articular cartilage (Hinton, Moody, Davis, & Thomas, 2002). It is a common chronic condition affecting older adults and is a major cause of pain and disability in older populations (PAGAC, 2008). Over 1/3 of those with OA state they are physically inactive (Kaplan, Huguet, Newsom, & McFarland, 2003).

Weight-bearing endurance and resistance PA can increase BMD and minimize the decrease in BMD in the spine and hip regions. PA is inversely associated with fracture risk, particularly those of the proximal femur. There is a dose-response relationship so that greater PA (frequency, duration, and/or intensity) confers greater risk reduction (PAGAC, 2008). Strong evidence suggests that endurance and resistance PA is beneficial for individuals with OA. Significant improvements in pain, physical function, quality of life, mental health, and delayed onset of disability have all been shown to occur by engaging in appropriate low-impact PA for approximately 150 minutes per week (PAGAC, 2008). In fact, the program, People with Arthritis

Can Exercise (PACE) has shown efficacy as a treatment for OA (Schoster, Callahan, Meier, Mielenz, & DiMartino, 2005).

In summary, the benefits of PA for older women are significant and numerous. It is clear that increasing PA in this population needs to be a priority.

### **Consequences of Physical Inactivity for Older Women**

The impact of physical inactivity to the health of older women is as detrimental as PA is beneficial. The consequences of physical inactivity for older women include increased morbidity and mortality and high health care costs.

**Morbidity.** Morbidity refers to the incidence of disease within a population (NCI, 2008). Incidence refers to the number of new cases of a particular condition diagnosed each year (NCI, 2008). The incidence of chronic conditions is on the rise in the US and chronic conditions contribute to significant disability among the adult US population. Fortunately, many chronic diseases are preventable or modifiable through specific health behaviors like PA (CDC, 2009c).

Relative risk refers to the estimated association between a behavior and the subsequent outcome (Replogle & Johnson, 2007). Table 1 presents the most common chronic conditions in the US and the increase of relative risk from physical inactivity. This evidence suggests that physical inactivity increases the incidence of chronic conditions (Booth & Lees, 2007). This relationship appears to be true even when confounding variables (age, sex, genetics, body size, dietary practices, smoking, alcohol consumption, income, and place of residence) are accounted for (Vuori, 2004).

TABLE 1. *Physical Inactivity and Relative Risk Increase of Chronic Conditions*

Chronic Conditions	Relative Risk Increase From Physical Inactivity
Coronary Artery Disease	45%
Stroke	60%
Hypertension	30%
Colon Cancer	41%
Breast Cancer	31%
Diabetes Mellitus Type II	50%
Osteoporosis	59%

Adapted from Booth, F. W. & Lees, S. J. (2007). Fundamental questions about genes, inactivity, and chronic diseases. *Physiological Genomics*, 28, 146-157.

The consequences of the increased incidence of chronic conditions are estimated by the attributable fraction, or the proportion of cases that would not have occurred in the absence of a behavior among the population (Steenland & Armstrong, 2006). The consequences of physical inactivity are shown in Table 2.

TABLE 2. *Health Consequences Related to Physical Inactivity*

Condition	% of Cases Related to Physical Inactivity	# of Preventable Deaths
Cardiovascular Disease	22	1,000,000+
Ischemic Stroke	11	300,000+
Breast Cancer	10	45,000
Colon Cancer	16	90,000
Diabetes Mellitus Type II	14	100,000+

Adapted from Bull, F. C., Armstrong, T. P., Dixon, T., Ham, S., Neiman, A., & Pratt, M. (2004). Physical inactivity. In Ezzati, M., Lopez, A. D., Rodgers, A., & Murray, C. J. L. (Eds.). *Comparative Quantification of Health Risks*. Located at [www.who.int/publications/cra/chapters/vol1/part3/en/index](http://www.who.int/publications/cra/chapters/vol1/part3/en/index). Accessed August 2007.

Physical inactivity contributes to the four leading chronic conditions (CVD, ischemic stroke, cancer, DM) in the US (CDC, 2009c). In particular, the relationship between CVD and physical inactivity is strong, resulting in more than 1/5 of all CVD cases per year (Bull, et al., 2004). It is highly likely that the incidence of chronic conditions would be lower if all adults, including older women, increased PA (George & Goldberg, 2001).

**Mortality.** Mortality refers to the number of deaths in a certain group of people in a given period of time (NCI, 2008). Evidence strongly supports an inverse association between PA and all-cause mortality in both men and women, even in those who are aged 65 years and older. In terms of relative risk, there is a median relative risk of 0.56 when comparing the most and least active older adults. Physically active older adults can lower their all-cause mortality risk by as much as 44% compared to their inactive counterparts (PAGAC, 2008, p. G1-3).

Bull and colleagues (2004) estimated the number of preventable deaths that occur as a result of physical inactivity. As shown in Table 2, more than 1,000,000 deaths from CVD alone are related to physical inactivity each year. Another 300,000 preventable deaths from ischemic stroke are related to physical inactivity. The mortality associated with each condition, however, could be reduced by increasing PA (Colbert, et al., 2004; Federal Interagency Forum on Aging-Related Statistics, 2006; Morey, Pieper, Crowley, Sullivan, & Puglisi, 2002).

**Health care costs.** The US spends significantly more on health care than any other nation, spending over \$7000 per person in 2006. The US also has one of the fastest growth rates of health spending, tripling expenditures since 1990. More than 75% of health care spending is for the care of people with chronic conditions (CDC, 2009d). Since physical inactivity is related to the development of chronic conditions, one can infer the health care costs associated with physical inactivity to be substantial.

According to Wang and colleagues (2004), the costs associated with physical inactivity amounted to \$5.4 billion in direct medical costs in 1996. Garrett and associates (2004) estimated that physical inactivity for one insurance company's population cost \$83.6 million annually in 2000. One can assume that the costs associated with physical inactivity have continued to climb

as the number of older women living with one or more chronic conditions has increased. Therefore, increasing PA in older women appears to be a grossly underutilized but effective way to control burgeoning health care costs.

The significance of the problem of physically inactive older women has been described. Next, prior research on why older women do not perform PA is discussed.

### **Prior Research on Older Women and Physical Activity**

Prior research on older women's PA focused on the reasons for physical inactivity, explanatory models on PA, and intervention strategies that have been tried to increase older women's PA. A discussion of prior research follows.

#### **Older Women's Reasons for Physical Inactivity**

Prior research on older women's reasons for physical inactivity has identified several factors. These factors generally fall in one of three categories: personal, socio-cultural, and environmental.

**Personal barriers.** Personal barriers to PA include beliefs about the self, beliefs about PA, competing commitments, and one's health and physical status. Personal barriers include beliefs about the self. For example, having low self-efficacy for PA (Eyler, et al., 2003; Schneider, Eveker, Bronder, Meiner, & Binder, 2003; Wilcox, Oberrecht, Bopp, Kammermann, & McElmurray, 2005), feeling too self-conscious for PA (Berg, Cromwell, & Arnett, 2002; Crombie, et al., 2004; Wilcox, et al., 2005), lacking self-discipline or motivation to become physically active (Lees, Clark, Nigg, & Newman, 2005; Schuler, Roy, Vinci, Philipp, & Cohen, 2006; Walcott-McQuigg, & Prohaska, 2001; Wilcox, et al., 2005), believing one is already active enough (Schneider, et al., 2003; Schuler, et al., 2006; Walcott-McQuigg & Prohaska, 2001), and

believing one is too unfit to be physically active (Crombie, et al., 2004) have all been identified as reasons why older women do not perform PA.

Personal barriers include beliefs about PA. Older women's beliefs about PA include PA being boring or not fun (Berg, et al., 2002; Crombie, et al., 2004; Schneider, et al., 2003; Wilcox, et al., 2005), PA being too expensive (Berg, et al., 2002; Schuler, et al., 2006; Wilcox, et al., 2005), PA posing a risk of injury (Resnick & Nigg, 2003; Wilcox, et al., 2005; Zijlstra, et al., 2007), PA not doing any good (Berg, et al., 2002; Crombie, et al., 2004; Schneider, et al., 2003), and PA causing fatigue (Walcott-McQuigg & Prohaska, 2001; Wilcox, et al., 2005). One's prior history with PA (e.g. failing at sports as a youth) also contributes to older women's physical inactivity (Kluge, 2002; Schuler, et al., 2006).

Personal barriers include competing commitments. Prior research has identified the following examples of older women's competing commitments: having insufficient time (Berg, et al., 2002; Lim & Taylor, 2005; Schneider, et al., 2003; Schuler, et al., 2006; Walcott-McQuigg & Prohaska, 2001; Wilcox, et al., 2005), caring for family comes first (Berg, et al., 2002; Lees, et al., 2005; Schneider, et al., 2003; Walcott-McQuigg & Prohaska, 2001; Wilcox, et al., 2005), having too many other household obligations (Schneider, et al., 2003; Wilcox, et al., 2005), having too many medical regimens to manage (Schneider, et al., 2003), and having other non-PA related community activities and commitments (Berg, et al., 2002; Schneider, et al., 2003; Wilcox, et al., 2005).

Personal barriers include older women's health and physical status. For instance, existing health problems (Berg, et al., 2002; Crombie, et al., 2004; Lees, et al., 2005; Lim & Taylor, 2005; Schneider, et al., 2003; Schuler, et al., 2006; Walcott-McQuigg & Prohaska, 2001;

Wilcox, et al., 2005) and feeling too tired to exercise (Berg, et al., 2002; Wilcox, et al., 2005) have been identified as barriers for older women's PA.

**Socio-cultural barriers.** Socio-cultural barriers include a lack of support from family, friends, and salient others and cultural barriers. Prior research suggests that the absence of support from family and friends, including having no one to participate in PA with (Booth, et al., 2000; Walcott-McQuigg & Prohaska, 2001; Wilcox, et al., 2005), lacking PA role models (Eyler, et al., 2003; Lim & Taylor, 2005; Wilcox, et al., 2005), and not having medical providers who recommend PA (Schongberg, Marcantonio, & Wee, 2006) are among the social barriers cited by older women.

Cultural barriers that have also been identified as being barriers for older women's PA. Cultural barriers include the belief that PA is only for young people (Berg, et al., 2002; Schuler, et al., 2006) and PA isn't appropriate for older women (Juarbe, Lipson, & Turok, 2003; Wilcox, et al., 2005).

**Environmental barriers.** Environmental barriers to older women's PA include lack of transportation (Berg, et al., 2002; Crombie, et al., 2004; Schuler, et al., 2006; Wilcox, et al., 2005), lack of sidewalks or walking paths in one's community (Booth, et al., 2000; Eyler, et al., 2003; Wilcox, et al., 2005), lack of PA facilities in one's community or needing to travel long distances to reach a PA facility (Wilcox, et al., 2005; Wilson, et al., 2004), and the lack of age-appropriate PA choices (Wilcox, et al., 2005). Also, threats to personal safety, including unsafe neighborhoods (Booth, et al., 2000; Eyler, et al., 2003; Wilcox, et al., 2005; Yancey, et al., 2004) and stray dogs (Wilcox, et al., 2005) have been identified as environmental barriers to older women's PA.

### **Explanatory Models of Older Adults' Physical Activity**

Two studies have tested the relationships between several factors to explain older adults' PA. Explanatory models explain how and why some phenomena (e.g. PA in older women) occur (Gregor, 2006). Resnick and Nigg (2003) found that health status and social support influence self-efficacy and outcome expectations, which directly influence PA. Their findings demonstrate that health and social support together explain 59% of outcome expectations and 63% of self-efficacy expectations. Health, self-efficacy, outcome expectations and fear of falling explain 48% of individual stage of behavior change. Together these categories explain 66% of PA behavior in older adults.

McAuley and colleagues (2003) tested the impact of several of the barriers to PA to determine which predicted long-term maintenance of PA in older adults. Their findings suggest that participants who participate in PA more frequently during a six-month structured program have higher levels of social support and have more positive PA experiences. Social, behavioral, and affective factors enhance self-efficacy, which results in higher levels of PA participation at 6- and 18-month follow-up. Greater social support within the PA setting is associated with more positive affective responses during the PA program. Participants' self-efficacy at the end of the program is predictive of participants' activity levels at 18 months. Their model accounts for 40% of the variation in long-term PA maintenance.

### **Physical Activity Intervention Studies**

A variety of intervention delivery methods have shown some success in motivating older women's PA. These delivery methods include face-to-face and telephone interventions (Marcus, et al., 2006), direct contact with exercise professionals, participant instruction regarding specific

modes and intensities of PA (Conn, Isaramali, et al., 2002), and web-based interventions (McKay, et al., 2001). Intervention settings include aggregate community sites (Conn, Isaramali, et al., 2002; Marcus, et al., 2006) and home-based settings (Marcus, et al., 2006).

Physical activity interventions include some combination of education and cognitive-behavioral strategies. Health education alone does not appear to be sufficient to motivate PA in older women. However, in combination, health education and cognitive-behavioral interventions have demonstrated effectiveness in motivating older women's PA (Marcus, et al., 2006; Conn, Minor, Burks, Rantz, & Pomeroy, 2003).

Cognitive-behavioral interventions most often target increasing participants' self-efficacy (Conn, Minor, et al., 2003). Other cognitive-behavioral interventions focused on participants' stages of change (Lippke, Ziegelmann, & Schwarzer, 2004), processes of change (Conn, Burks, Minor, & Mehr, 2003), and use of self-regulatory strategies. Self-regulatory strategies have included action planning and barrier management (Ziegelmann & Lippke, 2007).

### **Study Aims**

A growing body of literature indicates that in order for a new behavior to become adopted *and* maintained over time, a shift in one's identity is critical (Kearney & O'Sullivan, 2003). This appears to be true for the adoption of PA (Medina, 1996). Yet, no interventions have been tested to determine if this identity shift can be facilitated. Therefore, the aims of this study are:

1. To determine if physically active identities can be facilitated in older women.
2. To determine if facilitated physically active identities are associated with increased in PA in older women.

## Study Definitions

*Older women* are defined as females aged 65 and older, regardless of health status, and females aged 50 to 64 with clinically significant chronic conditions and/or functional impairments that affect movement ability, physical fitness, or PA (adapted from Nelson, et al., 2007). Clinically significant chronic conditions are those that require regular medical management (Nelson, et al., 2007) and have been present for three months or longer (National Center for Health Statistics, 2007). Functional impairments are deficits in one's ability to perform activities of daily living (ADL) and instrumental activities of daily living (IADL) (Nelson, et al., 2007). ADLs include the following: bathing, eating, toileting, dressing, transferring, and walking (Katz, Down, Cash, & Grotz, 1970). IADLs include the following: telephoning, shopping, preparing food, housekeeping, laundering, mode transportation, self-medicating, and managing finances (Lawton & Brody, 1969).

*Physical inactivity* is defined by some as complete inactivity, while others believe it is anything that is insufficient to yield health benefits (Vuori, 2004). For this study, physical inactivity is defined as no participation in leisure-time PA in the previous month, consistent with the leisure-time inactivity definition used by the CDC (2007a).

*Physical activity* is defined as any bodily movement produced by skeletal muscles that results in energy expenditure (Nelson, et al., 2007). PA can be categorized according to mode or purpose (PAGAC, 2008). The mode of PA refers to the type of PA and is based on individual abilities and preferences. Examples of the mode of PA include biking, walking, and weight lifting. Purpose refers to the context in which PA is performed. Examples of the purpose of PA include leisure-time, household, occupational, or transportation. PA is generally described in

terms of the frequency, intensity, and duration. Frequency refers to the number of PA sessions performed per week. Intensity refers to the magnitude of effort required to perform PA. It can be measured in several ways, although it is commonly estimated by the rate of perceived exertion (with the Borg Scale) (PAGAC, 2008) or the “talk test” (the ability to hold a conversation while performing PA) (Welch, 1998). Duration refers to the length of time of each PA session (PAGAC, 2008).

Exercise is a subcategory of PA that is planned, structured, repetitive, and purposive in improving or maintaining physical fitness. Physical fitness is defined as “the ability to carry out daily tasks with vigor and alertness without undue fatigue and with ample energy to enjoy leisure-time pursuits and meet unforeseen emergencies” (PAGAC, 2008). Physical fitness includes the following components: cardiorespiratory fitness, muscular strength, flexibility, and balance. Cardiorespiratory fitness is the ability of the circulatory and respiratory systems to supply oxygen during sustained PA. Cardiorespiratory fitness improves through aerobic PA. Muscular strength is the ability of a muscle or muscle group to exert force. Muscular strengthening includes the use of weights or other forms of resistance training. Flexibility is the range of motion possible of a joint. Flexibility training is accomplished through stretching joints through their full range of motion. Balance is the ability to maintain the body’s equilibrium while stationary or moving. Balance training includes static and dynamic PA to improve one’s ability to withstand challenges from postural sway (PAGAC, 2008).

One set of PA recommendations for older women is listed in Table 3. These recommendations suggest the physical fitness components that will most likely yield health benefits.

A weekly total of 150 minutes per week of aerobic activity is recommended to achieve substantial health benefits, although performing some aerobic PA is better than performing none at all (HHS, 2008). Muscle strengthening and flexibility are recommended two days per week on non-consecutive days (HHS, 2008; Nelson, et al., 2007). Balance training is recommended three or more days per week for those who are at high risk of falls (HHS, 2008). The recommended intensity and duration of PA for older women is based on their levels of fitness and the presence of chronic conditions. It is generally recommended that older women begin with short bouts (e.g. 10 minutes) of low to moderate intensity PA, especially for those who have been inactive for a period of time. Over time, older women can increase their intensity and duration to meet the recommended PA shown in Table 3 (HHS, 2008).

### Conclusion

In this chapter, the intervention study was introduced. The significance of the problem of physical inactivity in older women was discussed. Explanations from older women for their physical inactivity were identified. Prior research on motivating older women's PA was reviewed. The study's purpose was stated and the study concepts were defined.

TABLE 3. *Recommendations for Physical Activity for Older Adults*

Fitness Categories	Aerobics*	Muscle Strengthening*	Flexibility*	Balance**
Frequency	5 days/week	2 non-consecutive days/ week	2 days/ week	3 or more days/ week
Intensity	moderate	moderate	-	-
Duration	≥ 30 minutes	10-15 repetitions	≥ 10 min/day	90 minutes/week
Type	Rhythmic activity using large muscle groups	Resistance training	Stretching and range of motion activities	Backwards walking, heel walking, toe walking, Tai Chi

\*Adapted from Nelson, M. E., Rejeski, W. J., Blair, S. N., Duncan, P. W., Judge, J. O., King, A. C., et al. (2007). Physical activity and public health in older adults. *Circulation*, 116, 1094-1105.

\*\*Adapted from US Department of Health & Human Services (2008). *Physical Activity Guidelines for Americans*. Rockville, MD: HHS. Located at <http://www.health.gov/paguidelines/pdf/paguide.pdf>. Accessed August 2010.

## **CHAPTER TWO: CONCEPTUAL FRAMEWORK**

In this chapter, the conceptual model used for this study is presented. First, the theoretical concepts of self and identity are discussed. Then, a physically active identity and its antecedents are described. The process of the development of a physically active identity is elucidated. Constructivist theory, which guides the intervention, is discussed. Finally, the research hypotheses are identified.

### **Theoretical Concepts**

#### **The Nature of the Self**

The self is defined as a psychological apparatus that allows individuals to think consciously and reflexively about themselves. This psychological apparatus underlies all perceptions, beliefs, and feelings. It permits individuals to consider the relevance of what they experience, and allows individuals to deliberately regulate their own behavior (Leary & Tangney, 2003).

Several authors have described the self as being influenced by one's own cognitions as well as the cognitions of others. William James stated that the self includes the known and the knower, the object and the subject (Baumeister, 1999). Ralph Turner (1976) described the self as the inner self of feelings and impulses and the institutional self of public roles and social obligations. Baumeister (1999) stated that "selfhood" starts with body and grows to encompass a psychological being that contains thoughts, feelings, and attitudes, and one that is socially validated and holds down multiple places in the matrix of social relationships. Based on these descriptions of the self, one can argue that the self can be appropriately referred to as the self-system. To elucidate the self-system, a discussion of its development and structures follows.

**The development of the self-system.** The self-system is theorized by Baumeister (1999) to develop across the life-span through two primary processes, interpersonal processes and executive processes. Interpersonal processes refer to the ways in which individuals interact with others and forge lasting relationships. Executive processes refer to the control and choices one has over one's self-system (Baumeister, 1999). Together, the interpersonal and executive processes foster the development of the self-system.

**The structure of the self-system.** Markus (1977) described the structure of the self-system as composed of multiple self-schemas. Self-schemas are cognitive structures that organize knowledge about the self-system and reflect enduring, salient aspects of the self-system. A self-schema exists when a pertinent behavior is endorsed as both highly self-descriptive and highly important to an individual. That self-schema allows an individual to make quick and confident judgments and to accurately retrieve information relevant to that particular domain (Markus, 1977).

Individuals who have a self-schema are considered to be schematic. Individuals without self-schemas are considered to be aschematic. According to Markus (1977), an individual who is schematic is able to readily process information about the self in a given domain with relative ease, retrieve behavioral evidence from that domain, predict his/her own future behavior in that domain, and resist counter-schematic information about him/herself in that domain. Markus found that through the processes of self-rating, self-description, and self-prediction of behaviors, the presence of a self-schema is revealed.

Self-schemas occur in many domains (Markus, 1977). Domains refer to the content categories that individuals associate with their self-systems. For older women, common domains

include personal attributes or attitudes (e.g. intelligent, satisfied with life), physical (e.g. thin, fat), abilities/education (e.g. fluent in another language, have advanced degrees), lifestyle (e.g. live “simple” lifestyle, live on the coast), family (e.g. grandparent), relationships (e.g. sympathetic friend, lonely), occupation (e.g. prior career), material (e.g. owns own home, is poor), success (e.g. achievements, recognition), social responsibility (e.g. volunteerism), leisure (e.g. hobbies, recreational sports), health (e.g. presence of chronic diseases), independence/dependence (e.g. not a burden to others), death (e.g. having a prolonged death or terminal illness), threats (e.g. being abused), caregiving (e.g. unable to take care of grandchildren or spouse), and cognitive (e.g. to have “lost one’s mind”) (Hooker, 1992). Domains are added and subtracted from one’s self-system based on changes that occur within one’s life circumstances (Markus & Nurius, 1986).

Self-schemas are also temporal. That is, the self-system is composed of past, present, and possible self-schemas. Past and present self-schemas refer to the self system in the past and in the present, respectively (Markus & Nurius, 1986). Possible selves are described by Markus and Nurius (1986) as being derived from representations of the self in the past and present but reflect representations of the self in the future. They represent specific, individually significant hopes, fears, and fantasies that one has for oneself that have not yet been actualized. Possible selves are individualized, yet social, since many possible selves are the direct result of previous social comparisons in which one’s own thoughts, feelings, characteristics, and behaviors have been contrasted with those of salient others. In other words, possible selves are “What others are now, I might become.” Envisioning one’s possible selves allows one to consider future self-schemas that have not yet been confirmed through her social experience. Therefore, they serve as potent

motivators for behavior change at any given time (Markus & Herzog, 1991; Markus & Nurius, 1986).

Possible selves include hoped-for and feared selves. Hoped-for selves are self-schemas that one would like to become (Markus & Nurius, 1986). For instance, a woman may have a hoped-for self that is a healthy, functionally independent older woman who is able to care for herself and her family. Feared selves are self-schemas that one is afraid of becoming (Markus & Nurius, 1986). For instance, a woman may have a feared self that is a chronically ill older woman who is functionally dependent on others, and unable to care for herself and her family.

Possible selves motivate behavior in order to narrow a discrepancy between the present self and the hoped-for self, and to create discrepancy between the present self and the feared self. By envisioning possible selves, individuals will be more likely to engage in behavior that they believe will move them towards their hoped-for selves and away from their feared selves (Markus & Nurius, 1986; Markus & Herzog, 1991). For example, the woman mentioned above might be motivated to engage in health promoting behaviors like PA in order to realize her hoped-for self of being a healthy, functionally independent older woman who was capable of caring for herself and her family, and making her feared self of being chronically ill and dependent on others less likely.

### **The Nature of Identity**

The nature of identity is similar to the nature of the self-system. Identity has been defined as a commitment to aspects of self as defining and meaningful over time (Westen & Heim, 2003). According to Erikson, identity is a sense of self that develops in the course of life that both relates individuals to and sets individuals apart from their social milieu (Akhtar & Samuel,

1996). According to Moshman (1998), identity is not just an attempt to describe one's typical behaviors, but is also an account of the core beliefs and purposes that one construes as explaining those behaviors. Based on these descriptions, one could argue that identity and the self-schema can be used inter-changeably. Therefore, for the purpose of this study, the term "identity" will be used.

The process of developing an identity is a dynamic, lifelong process. It is rooted in the development of self in infancy, becomes reformulated in adolescence and continues to be modified throughout adulthood. The development of identities is best conceptualized as a circular process where individuals move back and forth between evaluating their identities and maintaining allegiance to them. Identities are added and removed based on one's social contexts and developmental stage (Grotevant, 1987). There is growing support for the existence of specific identities. Examples of specific identities follow.

### **Examples of Specific Identities**

Examples of specific identities have been described in the literature. For instance, research supports the existence of an identity associated with being old. Whaley and Ebbeck (2002) found that being old means "having physical aches and pains," and "not being able to do the things I used to do." An "old" identity was more associated with functional and social aging rather than chronological aging. Frazier and Hooker's (2006) findings supported the existence of health-related identities. They reported that most adults had at least one possible health-related identity by the time they reached the fourth decade of life. The emphasis on health-related identities continued through older adulthood with older adults having more hoped-for and feared

identities in the domains of health, physical status, and independence compared with young and middle-aged adults (Hooker, 1992; Hooker & Kaus, 1992).

Research has shown that physically active identities exist (Kendzierski, 1988), even among older women (Hardcastle & Taylor, 2005; Whaley & Ebbeck, 2002). A discussion of physically active identities follows.

### **Physically Active Identities**

Kendzierski (1988) defined an “exerciser” identity as someone who was schematic for PA. Medina (1996) defined an exerciser identity as seeing oneself as being physically active. Whaley and Ebbeck (2002) defined a physically active identity as seeing oneself as being physically active or physically inclined. Kluge (2002) stated that those who have physically active identities view PA a part of who they are, much like breathing. Finally, Hardcastle and Taylor (2005) described individuals with physically active identities as those who prioritize and plan for PA, those who promote PA to others, and those who make PA a habit.

The existence of a physically active identity has been shown to be related to PA behavior. Kendzierski (1988) found that individuals who had an exercise identity reported being physically active more days per week on average than those who did not have this identity. Hays, Damush, and Clark (2005) also found that older women’s PA self-definitions were related to their PA participation.

The relationship between one’s PA behavior and one’s physically active identity is consistent with other behavior change research findings. Kearney and O’Sullivan’s (2003) conducted a grounded theory study on behavioral change. Qualitative studies of smoking cessation, alcohol- and drug-abuse recovery, weight loss, and cardiovascular risk reduction were

analyzed to identify the common pathways of health behavior change. They found that in order for a new behavior to be maintained over time, having an identity that included the new behavior was critical.

Prior research indicates that performing PA is necessary in order to develop a physically active identity. Anderson and Cychosz (1995) found that as individuals' minutes of PA performed per week increased, the strength with which they identified with physically active identities also increased. Hays, et al. (2005) found that PA self-definitions were strengthened through continued exposure to PA. While performing PA is necessary to develop a physically active identity, the time in which it takes for one to develop a physically active identity can take up to ten years (Medina, 1996). Older women cannot wait up to ten years for physically active identities to develop. Thus, strategies must be employed to facilitate the physically active identity development process so that a physically active identity can be attained in a shorter period of time.

Before the physically active identity development process can be understood, antecedents to identity development need to be discussed. Antecedents include the influences on identity development and engagement in the identity development process.

### **Influences on Physically Active Identity Development**

Several factors influence physically active identity development. These factors include the contexts of development and individual characteristics (Grotevant, 1987). The contexts of development include socio-cultural and environmental contexts of the individual (Markus & Herzog, 1991). Individual characteristics include demographic and personal characteristics. Demographic characteristics include age, gender, health status, and socio-economic status

(Herzog & Markus, 1999). Personal characteristics include self-esteem, self-monitoring, and ego-resiliency (Grotevant, 1987).

### **Contexts of Physically Active Identity Development**

**Socio-cultural contexts.** Social contexts refer to the patterns that constitute families, groups, networks, and organizations (Stets & Burke, 2003). Cultural contexts are defined as the complex whole which includes knowledge, belief, art, law, morals, custom, and any other capabilities and habits acquired by an individual a member of society (Tylor, 1871). The socio-cultural context influences older women's development of physically active identities because it defines the values, ideals, and standards toward which individuals strive. It also determines the extent to which new identities will be supported by others (Cross & Gore, 2003; Markus & Kitayama, 1999).

Social acceptance of PA is a socio-cultural influence for older women. When older adults contemplate pursuing PA, they consider the social ramifications of their PA involvement relative to significant people in their lives. Significant people included PA instructors/coaches, physicians, family members, and peers (Cousins, 2003). If there is social acceptance of PA among an individual's salient others, that individual will likely be more successful in adopting a physically active identity.

**Environmental contexts.** Environmental contexts refer to the physical conditions and situations that individuals exist within. Environmental contexts influence the development of physically active identities to the extent that one's identity and one's environment must "fit" (Baumeister & Vohs, 2003). For instance, Wilcox, et al. (2005) found that the environmental contexts of the unavailability of age-appropriate PA, unsafe neighborhoods, and lack of

sidewalks and walking paths made it difficult for older women to become physically active.

Identity development interventions that consider the environmental contexts of participants are likely to be more effective than interventions that do not.

### **Individual Characteristics**

**Age.** Age affects physically active identity development because women at different life stages take on different foci in describing their future and past selves. Older persons hold more past selves than younger persons but fewer possible selves (Cross & Markus, 1991). This suggests that as individuals get older, they see their futures consolidating around fewer aspects of the self-system (Herzog & Markus, 1999). For older women, research suggests that hoped-for selves generally focus on personal growth and development, while feared selves generally focus on physical and social loss (Cross & Markus, 1991; Black, Stein, & Loveland-Cherry, 2001; Fleury, Sedikides, & Donovan, 2002). Identity development interventions are likely to be more effective if they account for age-related norms.

**Gender.** Gender affects physically active identity development to the extent that gender influences what aspects of identity are considered to be acceptable within one's larger socio-cultural context (Knox, 2006). For instance, females' identities have been characterized as incorporating qualities of expressiveness, including a strong emphasis on interpersonal relationships, sensitivity, and nurturing. In contrast, males' identities have been characterized by agency, instrumentality, individuation or independence, and competition (Block, 1983). Identity development interventions that account for the influence of valued gender roles and qualities are likely to be more effective than those that do not.

**Health status.** Research has shown that one's health status is related to some identities becoming more relevant and others less so. As one's health status changes, some identities are discarded so that the individual can focus on other identities (Frazier & Hooker, 2006). For instance, an older woman might have possible selves that include being an exerciser, an author, and a grandparent. If that individual was diagnosed with breast cancer, she might discard the possible self of being an author so that she could add a possible self in her health domain as a cancer survivor and still maintain her possible selves as an exerciser and grandparent. Health status can also be the reason one chooses to develop a physically active identity. According to Medina (1996), dissatisfaction with one's health status can be the motivation to pursue PA. Health status can also restrict PA choices to the extent that one's identity in the PA domain must be congruent with the individual's physical abilities (Medina, 1996). Identity interventions that take participants' health statuses into account are likely to be more effective and safer than those that do not.

**Socio-economic status.** Socio-economic status affects physically active identity development because it facilitates or limits exposure to information and knowledge. Affluent individuals can afford to pursue a variety of interests. Thus, they are able to develop a broader and more diverse self-system that includes a wide array of current and particularly possible selves (Herzog & Markus, 1999). Identity interventions that account for participants' socio-economic statuses are more likely to be effective than those that do not.

**Self-esteem.** Self-esteem is defined as an individual's sense of value or self-worth (Blascovich & Tomaka, 1991). Older women have varying levels of self-esteem (Misra, Alexy, & Panigrahi, 1996). Self-esteem influences identity development by freeing one to consider

one's identity options (Grotevant & Cooper, 1987). Medina (1996) found that exercisers valued themselves enough to feel justified doing PA "for myself." Hardcastle and Taylor's (2005) found that some older women felt guilty taking time to exercise. Developing a physically active identity is likely to be more successful among individuals with high levels of self-esteem.

**Psychological self-monitoring.** Psychological self-monitoring refers to the propensity of individuals to change their behavior as a function of how they interpret external cues from their current situation (Snyder, 1974). Psychological self-monitoring influences identity development by providing a method by which individuals control the images of the self that they project through social interactions. Individuals have varying levels of psychological self-monitoring. High psychological self-monitoring individuals are more likely to discriminate between the social appropriateness of their behaviors and adjust them based on their perception of social feedback from salient others (Snyder, 1974). High psychological self-monitors are more likely to alter their physically active identities to group norms than low psychological self-monitors.

**Ego-resiliency.** Ego-resiliency refers to the degree of flexibility one shows when confronted with new and challenging situations (Block & Block, 1980). Ego-resiliency influences identity development by supporting or undermining the problem-solving aspects of the identity development process (Grotevant, 1987). Those with high levels of ego-resiliency will be better able to develop a physically active identity than those with low levels of ego-resiliency. Medina (1996) found that some individuals believed they are unable to change. This prevented them from trying very hard to adopt PA. This supports the role that ego-resiliency plays in physically active identity formation.

A summary of the influences on identity development are presented in Table 4. Included are the contexts of development, including the socio-cultural and environmental contexts, and the individual characteristics, including demographics and personal characteristics.

Contexts of Development	Individual Characteristics
Socio-cultural Contexts: Socially Accepted Behaviors	Demographics: Age, Gender, Health Status, Socio-economic Status
Environmental Contexts: Safety, Access	Personal Characteristics: Self-esteem, Psychological Self-monitoring, Ego-resiliency

### **Engagement in the Physically Active Identity Development Process**

Engagement in the identity development process refers to the interaction of contexts of development and individual characteristics. This interaction is what determines the likelihood that an individual will begin identity development at any given time. If individuals see a conflict between their contexts of development and individual characteristics, they will have a critical experience (Kearney & O’Sullivan, 2003; Medina, 1996). This leads to identity appraisal which leads to a mental commitment to change (Grotevant, 1987; Medina, 1996). See Figure 1.

#### **Critical Experience**

Critical experiences include “eye-opening” experiences (e.g. being newly diagnosed with a medical condition) and significant life events (e.g. the birth of one’s first grandchild) and can be positive (e.g. becoming newly married) or negative (e.g. becoming divorced). The critical experience serves as the catalyst for individuals to undertake the “identity appraisal” process (Medina, 1996).

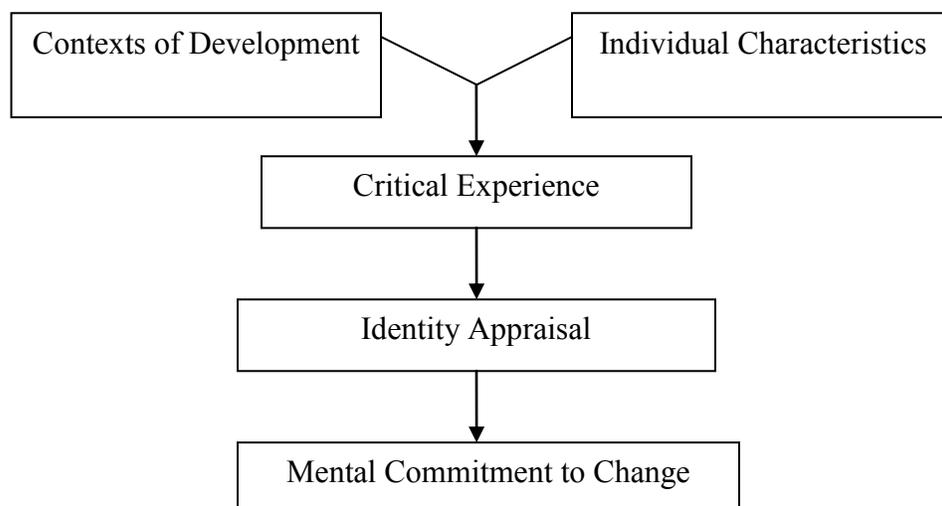


FIGURE 1. Engagement in the Physically Active Identity Development Process.

### **Identity Appraisal**

Identity appraisal refers to the self-examination that follows the critical experience. It is described as “taking a hard look at oneself” (Kearney & O’Sullivan, 2003). If the result of the identity appraisal process is feeling unsatisfied, the individual makes a mental commitment to change (Medina, 1996). Greater dissatisfaction leads to a stronger mental commitment to change (Grotevant, 1987).

### **Mental Commitment to Change**

Mental commitment to change refers to when the individual emphasizes the need to see PA as an important and valuable part of her life. It involves valuing PA enough to make the investments in time and effort necessary to adopt a physically active lifestyle. It also includes imagining ways to overcome perceived barriers that are likely to be encountered and committing to PA continuation even when the benefits of PA are not evident (Medina, 1996).

For the purpose of this study, it will be assumed that subjects in this study will already have had a critical experience, done an identity appraisal, and made a mental commitment to change. The intervention for this study will focus on the next step, the physically active identity development process.

### **The Physically Active Identity Development Process Model**

The physically active identity development process model will guide the study's intervention. It was constructed using concepts identified in research on identity formation (Grotevant, 1987; Markus & Nurius, 1986; Medina, 1996), behavior change (Bandura, 1999a, 1999b; Kearney & O'Sullivan, 2003), wellness motivation (Fleury, 1991), and constructivist theory (Kelly, 1955, 1963). Included are the exploration process, the assessment of affective, cognitive, and physical outcomes, identity consolidation, identity evaluation, and a constructivist environment. See Figure 2.

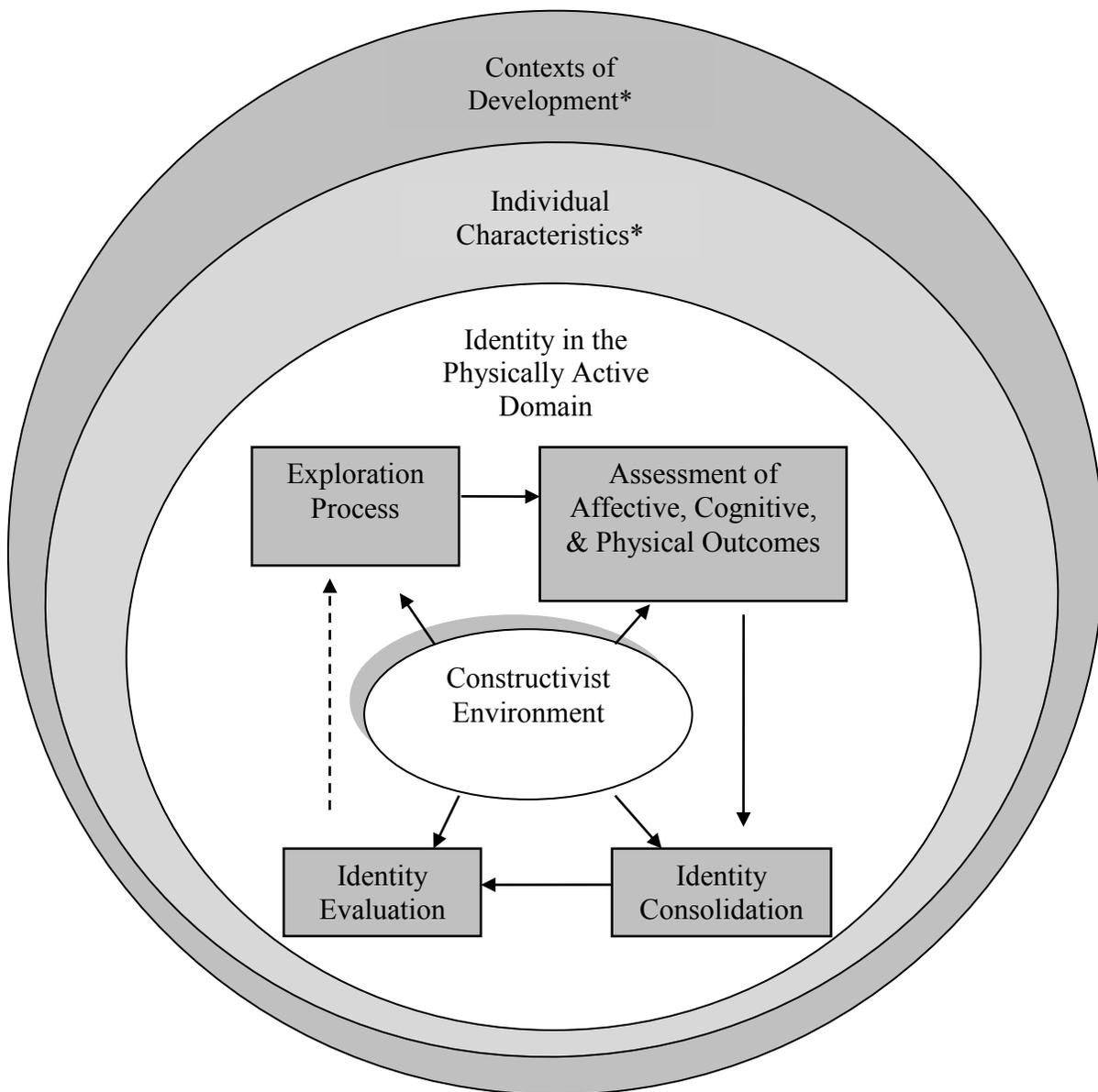


FIGURE 2. Physically Active Identity Development Process Conceptual Model.

\**Contexts of development* include socio-cultural and environmental contexts of the individual. *Individual characteristics* include demographic and personal characteristics. When one's contexts of development and individual characteristics are not congruent, one experiences a "critical experience" and becomes open to the identity development process.

## The Exploration Process

The exploration process refers to the consideration of possible choices and movement toward making choices (Grotevant, 1987). Critical steps in the exploration process include the following: imaging (Fleury, 1991), understanding expectations and beliefs (Grotevant, 1987), experimenting (Medina, 1996), investing (Grotevant, 1987), understanding competing forces (Grotevant, 1987), performing interim evaluations (Grotevant, 1987; Medina, 1996). See Figure 3.

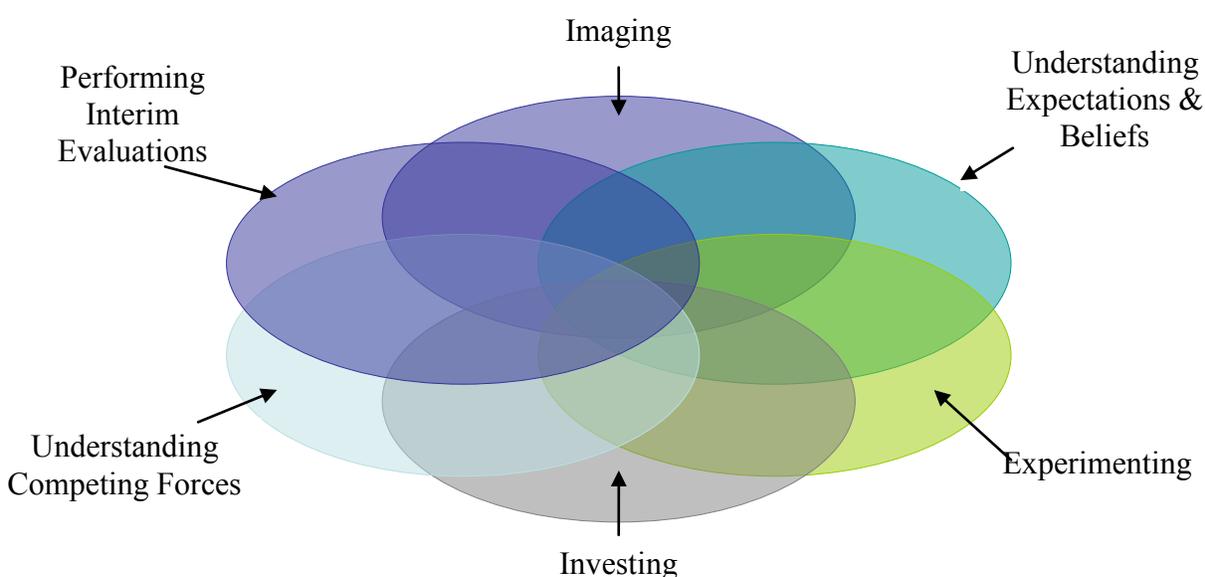


FIGURE 3. The Exploration Process.

**Imaging.** The exploration process begins with imaging. Imaging is defined by Fleury (1991) as constructing images of the self as desired ways of being and the creation of action statements based on those ways of being. Imaging includes constructing mental representations of both desirable and undesirable states as well as the specific plans to realize or avoid those states. Individuals visualize various plans of action in relation to perceived ability, potential

barriers, and past experiences to determine the plan of action they think will be effective and feasible in leading to desired goals. The processes of imaging include identifying possible selves, articulating physically active prototypes, and constructing action statements.

Imaging includes articulating possible selves. Possible selves are *intrapersonal*; that is, they are the images individuals have of themselves in the future (Ouellette, Hessling, Gibbons, Reis-Gergan, & Gerrard, 2005). Possible selves have two primary functions. First, possible selves are motivators, functioning as incentives for future behavior. Second, possible selves are instrumental in the affirmation and defense of the now self. This is because possible selves provide an evaluative and interpretive context for the current view of self. Once discrepancies are identified between one's current and possible selves, the individual is prompted to undertake action designed to decrease the discrepancy between the current and hoped-for possible selves or increase the discrepancy between the current and feared possible selves (Cross & Markus, 1991; Markus & Nurius, 1986).

Imaging also includes mental representations or prototypes, which are *interpersonal* images of others in the here and now (Ouellette, et al., 2005). Prototypes reflect the "typical" person who belongs to a group or engages in a certain behavior (Barton, Chassin, Presson, & Sherman, 1982). These images usually have distinct attributes associated with them. Prototypes can be both positive and negative. For instance, older women may believe the prototype of a physically active person is thin and attractive (a positive prototype) or masculine and sweaty (a negative prototype). Thus, prototypes influence behavior change by providing social comparisons for a particular identity domain in the here and now (Ouellette, et al., 2005).

Imaging also consists of making action statements (Fleury, 1991). Action statements are the cognitive link between one's intentions and one's actions (Gollwitzer, 1999). Action statements consist of mental simulations of one's identity goals. They also include mental simulations of how to cope with obstacles in the pursuit of one's identity goals (Koestner, Lekes, Powers, & Chicoine, 2002).

Prior research supports the role that imaging plays in the adoption of a physically active identity. Ouellette and colleagues (2005) found that contemplation of possible selves and prototype images of physically active individuals influenced PA behavior. Also, individuals were influenced more by possible selves if they were future-oriented (e.g. making present choices based on future consequences). Individuals were influenced more by prototypes if they were more present-oriented (e.g. living in the here and now). Action statements have also been identified as contributing to the adoption of PA by Lippke, et al. (2004). They found that when individuals were asked to write down the PA they intended to do and formed action plans by specifying where, when, how often, how long, with whom, and by what means the activity would be done, participants had greater adherence to PA.

**Understanding expectations and beliefs.** The exploration process includes understanding expectations and beliefs. Expectations and beliefs are the pre-existing cognitions that one has about PA and one's ability to perform PA.

Pre-existing cognitions reflect one's self-efficacy as it relates to PA. Self-efficacy is defined as beliefs (accurate or not) about one's competencies and one's ability to exercise these competencies in certain situations (Maddux & Gosselin, 2003). Self-efficacy beliefs have been identified by several authors as affecting older adults' PA (Eyler, et al., 2003; Schneider, et al.,

2003; Wilcox, et al., 2005). Thus, if an individual has low self-efficacy for PA, she will be less likely to adopt a physically active identity.

Pre-existing cognitions reflects one's beliefs about PA. For example, some believe PA is only for young people (Berg, et al., 2002; Schuler, et al., 2006) and is not for older women (Juarbe, Lipson, & Turok, 2003; Wilcox, et al., 2005). Others believe PA is boring (Berg, et al., 2002; Crombie, et al., 2004; Schneider, et al., 2003; Wilcox, et al., 2005), will cause injury (including falls) (Resnick & Nigg, 2003; Wilcox, et al., 2005; Zijlstra, et al., 2007), or will not benefit the health of an older or chronically ill adult (Crombie, et al., Schneider, et al., 2003). Thus, if an individual has negative pre-existing cognitions about PA, she will be less likely to develop a physically active identity.

Pre-existing cognitions reflect one's prior experiences with PA. Medina (1996) found that some individuals had negative prior experiences (e.g. getting injured or knowing someone who got injured). Others had positive prior experiences (e.g. winning sports competitions in childhood). Others had no prior PA experiences at all. Thus, if an individual had positive prior experiences with PA, she will be more likely to develop a physically active identity compared with individuals who have had either no prior PA experiences or negative prior PA experiences.

**Experimenting.** Experimenting is part of the exploration process and refers to when individuals move from imagining PA to performing PA. It includes trying different kinds, frequencies, intensities, and durations of PA and different schedules and contexts of PA. The goal of experimenting is to find PA that has a good "personal fit" with individuals' preferences, lifestyles, and health statuses (Medina, 1996). Kearney and O'Sullivan (2003) found that individuals made a "small tentative first step." It was this first step that began the process of

performing a new behavior. Through the process of trial and error, individuals found what was personally acceptable and began “walking the walk, talking the talk.”

**Investing.** Investing is part of the exploration process (Grotevant, 1987). Investing refers to putting time, energy, and resources towards a particular course of action. As more investments are made in a particular behavior, the more likely it is that the individual will continue to pursue that behavior in order to receive a “return” on her investment. The extent to which other aspects of one’s life become intertwined with a new behavior (e.g. PA) determines the likelihood that the new behavior will become part of the individual’s self-system (Grotevant, 1987).

Medina (1996) describes exercisers as individuals who changed other lifestyle habits such as diet and sleeping habits in order to improve upon PA participation and performance. This reflects a high level of investment which then influences the development of a physically active identity. For example, an older woman might spend time finding caregivers to assist her with caregiving for her spouse. She might make the effort to train those caregivers on the specific types of caregiving assistance her spouse needs. She might commit a certain amount of monetary resources toward sustaining this caregiving assistance over time so that she can pursue PA. If so, she will have made a significant investment towards her development of a physically active identity.

**Understanding competing forces.** Understanding competing forces is part of the exploration process and refers to acknowledging alternative behaviors that may be more desirable at times and the counter-balancing factors in life that discourage the continuation of the exploration process (Grotevant, 1987).

Competing forces include alternative behaviors, competing commitments, and social pressures.

Alternative behaviors are those behaviors that seem more desirable at any given time. These alternative behaviors cause lapses in PA. Lapsing reflects a temporary slip in the management of progressive change with a return to previous patterns of behavior. It involves the re-emergence of previous habits (e.g. physical inactivity) in response to environmental and/or emotional cues (Fleury, 1991). For example, during the holiday season, older women may prefer to shop or spend time with their families as opposed to performing PA.

Competing commitments refer to other roles and responsibilities valued by an individual that make performing PA difficult. For instance, several authors have identified family commitments (Berg, et al., 2002; Lees, et al., 2005; Schneider, et al., 2003; Walcott-McQuigg & Prohaska, 2001; Wilcox, et al., 2005), household obligations (Schneider, et al., 2003; Wilcox, et al., 2005), service-related (Schneider, et al., 2003; Wilcox, et al., 2005) and religious activities (Berg, et al., 2002) as competing commitments for older women. Thus, a physically active identity is more likely to be developed when competing commitments are minimized.

Social pressures are pressures applied by salient others that persuade one to discontinue a new behavior. Kearney and O'Sullivan (2003) found that social pressures to revert back to old behaviors were persistent, especially among women. Research suggests that the lack of support among family and friends and the lack of a partner to perform PA with are barriers to older women's PA (Booth, et al., 2000; Walcott-McQuigg & Prohaska, 2001; Wilcox, et al., 2005). Thus, a physically active identity is more likely to be developed in individuals who have the support from salient others.

**Performing interim evaluations.** Performing interim evaluations is the last part of the exploration process. Performing interim evaluations takes place from the moment PA is initiated. It refers to becoming aware of immediate positive and negative reactions to PA (Medina, 1996). Kearney and O'Sullivan (2003) found that if individuals believed their "first steps" of a particular behavior were successful, they had the opportunity to consider what life would be like with the new behavior. This glimpse of a new identity further enabled the process of performing the new behavior. The noticeable rewards that followed the new behavior lead to a continuation of change. For example, an older woman might take up Tai Chi for exercise. She may notice an improvement in her balance soon thereafter. She might evaluate this as a positive interim evaluation, which would motivate her to continue with Tai Chi.

In summary, the exploration process consists of imaging, understanding one's expectations and beliefs, experimenting, investing, understanding competing forces, and performing interim evaluations. Following the exploration process, individuals assess the affective, cognitive, and physical outcomes.

### **Assessment of Affective, Cognitive, and Physical Outcomes**

Assessment of the affective, cognitive (Grotevant, 1987), and physical outcomes (Medina, 1996) is the next stage of the physically active identity development process. It is characterized as the point at which individuals seriously weigh their involvement with PA. At this stage in the process, individuals ask themselves whether or not the rewards of PA outweigh the costs associated with PA (Medina, 1996). See Figure 4.

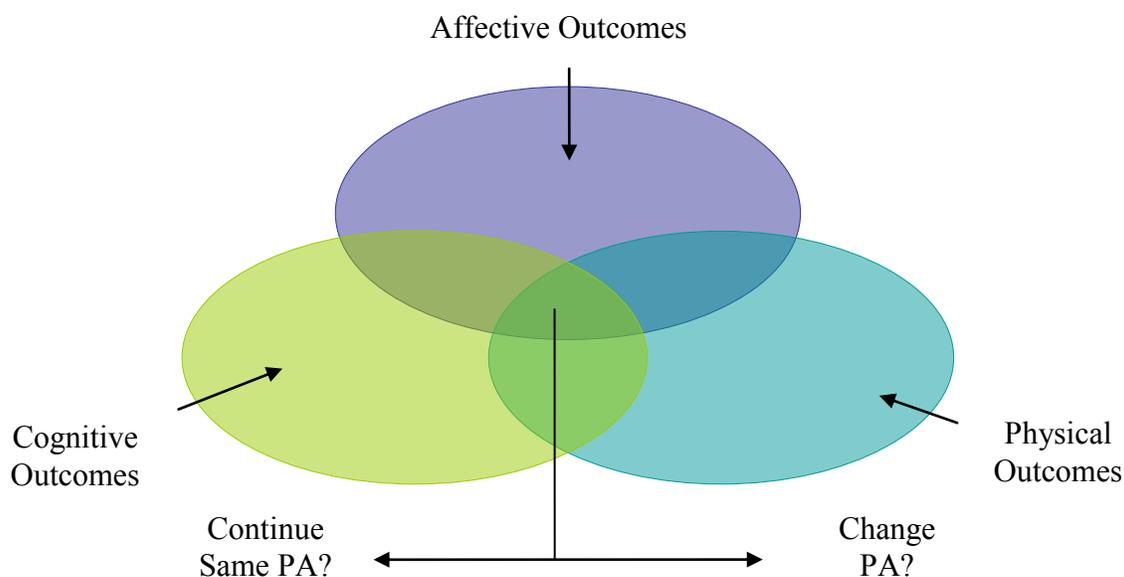


FIGURE 4. Assessment of Affective, Cognitive, and Physical Outcomes.

**Affective outcomes.** Affective outcomes refer to the consequences of a behavior to one's feelings and emotions. Affective outcomes can be positive or negative. Positive affective outcomes might include feelings of satisfaction (Grotevant, 1987). For example, Hardcastle and Taylor (2005) found that participants described feelings of achievement, social interaction, and a sense of belonging as resulting in PA participation. Fleury (1996) described feelings of harmony with the process of change. Medina (1996) described feelings of enjoyment associated with PA.

Negative affective outcomes might include sadness over opportunities forgone when PA choices are made (Grotevant, 1987). For example, Fleury (1991) found that individuals expressed a sense of loss when attempting to realize goals since they limited their involvement in previous activities. Kearney and O'Sullivan (2003) describe feelings of boredom associated with new behaviors.

Medina (1996) and Hardcastle and Taylor (2005) found that some individuals initially reported feeling negative affective outcomes but later felt positive affective outcomes. For instance, participants initially felt guilty for taking the time to perform PA. Over time, however, the guilt became more associated with missing PA rather than with performing PA. If one's overall assessment of affective outcomes is positive, the likelihood that she will develop a physically active identity increases.

**Cognitive outcomes.** Cognitive outcomes refer to the consequences of PA on the executive processes of choice and control (Baumeister, 1999). Support for positive cognitive outcomes include increased autonomy (Hardcastle & Taylor, 2005), control (Fleury, 1996; Hardcastle & Taylor, 2005; Kearney & O'Sullivan, 2003), newly developed assertiveness (Kearney & O'Sullivan, 2003), and efficacy (Fleury, 1996). If one's overall assessment of cognitive outcomes is positive, the likelihood that she will develop a physically active identity increases.

**Physical outcomes.** Physical outcomes have been identified as resulting from the exploration process and can be positive or negative. Numerous positive physical outcomes have been identified. Examples of positive physical outcomes include preservation or improvement in functional status (Jette, et al., 1999; Stessman, et al., 2002), and improvement in strength, endurance, flexibility, range of motion, balance, and aerobic capacity (Binder, et al., 2002; Westerterp, 2000). Negative physical outcomes associated with PA include becoming injured (Medina, 1996), experiencing physical fatigue (Kearney & O'Sullivan, 2003) or experiencing "aches and pains" associated with PA (Medina, 1996; Whaley, 2003). If an individual's overall assessment of physical outcomes is positive, the likelihood that she will develop a physically

active identity increases. Following the assessment of the affective, cognitive, and physical outcomes, one must assess the extent to which the new identity becomes consolidated into one's overall identity.

### **Identity Consolidation**

Identity consolidation is defined as the extent to which one feels a sense of personal continuity over time. A consolidated identity is ultimately reflected in the integration of the new facets of identity into a coherent whole (Grotevant, 1987). Identity consolidation is described by Kearney and O'Sullivan (2003) as individuals seeing themselves in a "new light." This realization of a "new" self fueled and was fueled by performing the new behavior. Fleury (1991) described identity consolidation as integrating change. As lifestyle changes were sustained, individuals perceived the changes as being incorporated into existing life patterns. The new behavior was now part of individuals' "new normal," and was no longer seen as something outside their usual routine.

In this study, identity consolidation is the extent to which a physically active identity is integrated with other identities and incorporated into an overall self among subjects. See Figure 5.

Identity consolidation can be categorized by one of four statuses: identity achievement, identity moratorium, identity foreclosure, and identity diffusion. See Table 5. These identity statuses represent a continuum of identity consolidation, with identity achievement at one end of the continuum, identity diffusion at the other end of the continuum, and identity moratorium and identity foreclosure in the middle (Marcia, 1966). Examples of each identity consolidation within each status follow.

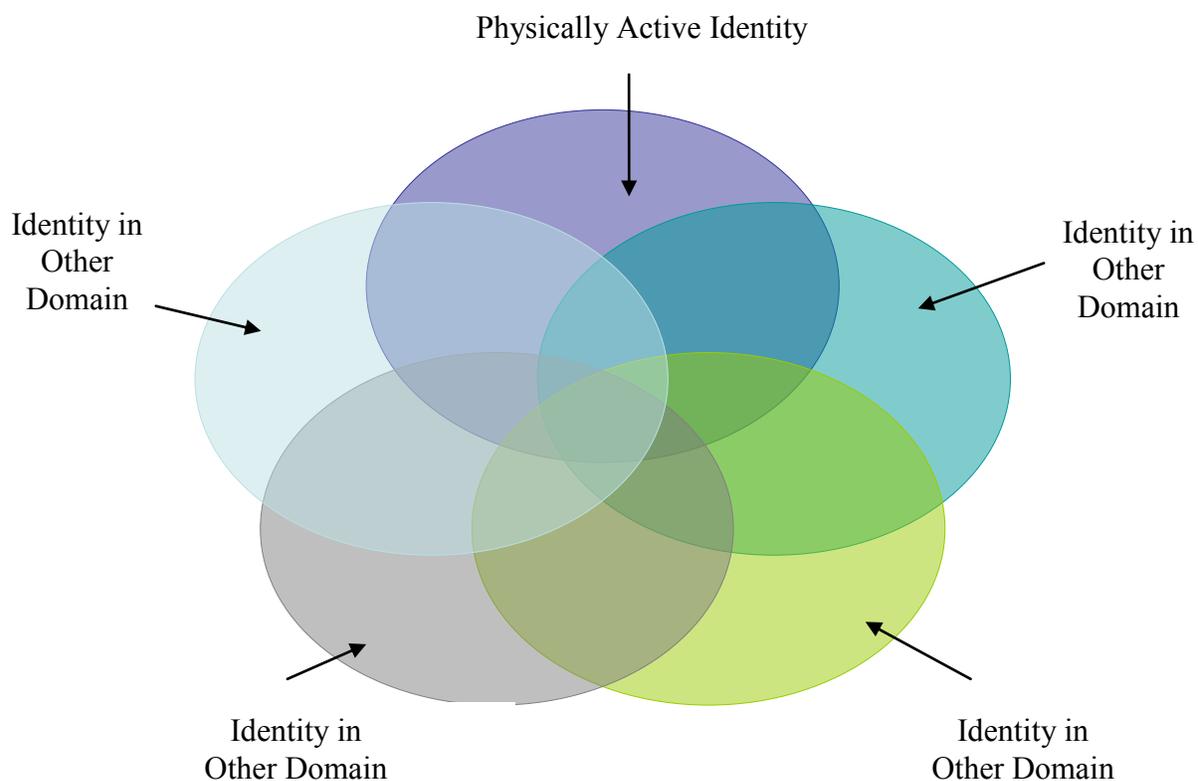


FIGURE 5. Identity Consolidation.

TABLE 5. *Identity Consolidation*

Identity Status	Description
Identity Achievement	An individual makes a commitment to a sense of identity that he or she has chosen.
Identity Moratorium	An individual is still exploring various commitments and is ready to make choices, but has not committed to one of these choices yet.
Identity Foreclosure	An individual seems willing to make a commitment to achieving an identity in the future but has not yet begun doing so.
Identity Diffusion	An individual has no sense of having choices so does not make a commitment towards pursuing identity development.

Based on Marcia, J. (1966). Development and validation of ego-identity status. *Journal of Personality and Social Psychology*, 3, 551-558.

An example of identity achievement in this study is an older woman who identifies herself as a physically active person. This study's intervention will aim to move subjects toward

identity achievement status. An example of identity moratorium is an older woman who is exploring new identities related to PA but does not yet identify herself as a physically active person. An example of identity foreclosure is an older woman who verbalizes interest in becoming physically active, but has yet to engage in the processes of imaging or experimenting. Finally, an example of identity diffusion is an older woman who believes that becoming physically active is not an option for her, and therefore, discontinues participation in the physically active identity development process. Following identity consolidation, one evaluates his or her new identity within a particular domain.

### **Identity Evaluation**

Identity evaluation is similar to what Erikson described as ego identity achievement (Marcia, 1966). Ego identity achievement reflects identity evaluation because it refers to the extent to which the individual's relationships with society and the feelings of continuity within him- or herself are connected. Medina's (1996) findings support identity evaluation in that once an individual adopted a physically active identity, that identity was solidified upon its validation by others. See Figure 6.

The intervention in this study will consist of guiding participants through the physically active identity development process. The context in which the intervention will be conducted is guided by constructivist theory.

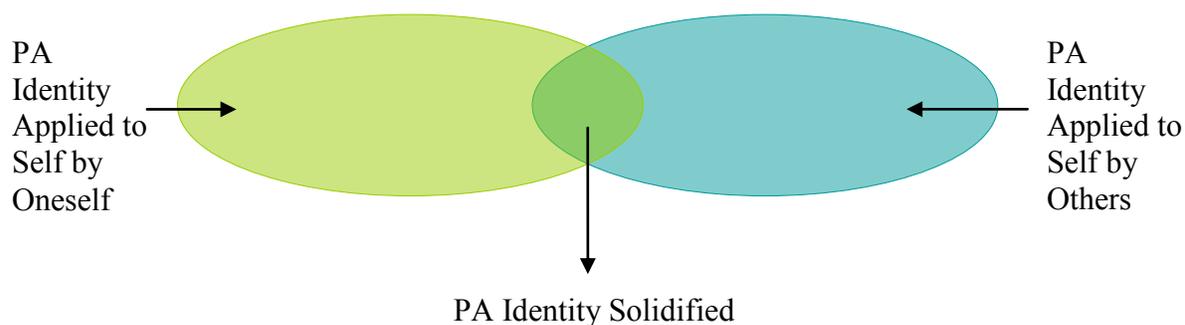


FIGURE 6. Identity Evaluation

### Constructivist Theory

Constructivist theory supports the idea that humans are active builders of knowledge and actively test their own “theories” about their world (Papert, 1999). In order to understand constructivist theory, one must understand basic constructivist principles including how meaning, learning, and knowledge are conceptualized within this theoretical context.

Meaning is defined as “factual” elements associated with a particular phenomenon that is individually assigned and influenced by social interactions (Audi, 1999). Learning is the experiential process of assigning meaning (Kivinen & Ristela, 2003). Learning involves the process of interpreting events within one’s own mind and sharing that interpretation with others. Once shared, interpretations may be validated or altered based on one’s interplay with others. For the purpose of this study, learning refers to individuals assigning meaning about themselves and PA while being influenced by similar others.

According to Piaget, intelligence consists of two interrelated processes, organization and adaptation. Individuals organize their thoughts so that they separate out important ideas from

unimportant ideas. Simultaneously, individuals adapt their thinking to include new ideas since new experiences provide additional “data” in which to construct new thoughts. Adaptation has two pathways, assimilation and accommodation. In assimilation, new information is added to existing cognitive organization (schemas). In accommodation, intellectual organization (i.e. development and revision of schemas) change to adjust for new information (Berger, 1978). The result of organization and adaptation of thoughts is new knowledge construction. For the purpose of this study, individuals will be guided to develop physically active identities and in so doing, construct self-knowledge as it relates to PA.

### **Personal Construct Psychology**

The process of self-knowledge construction is based on previous work by Kelly (1955). According to Personal Construct Psychology (PCP), people are self-scientists. As such, they form theories about themselves. In constructing these self-theories, individuals interpret “data” from their social world and then act based on their interpretation of that data. As their self-theories are tested through their experiences, they revise their self-theories as deemed necessary.

Identities are developed through the interface of individual cognitive processes (e.g. an individual’s identity) and socially-constructed processes (e.g. identities assigned by others) (Kelly, 1963). If one’s identity is similar to identities she is assigned by salient others, those identities become validated and continue to be part of the individual’s overall identity (Botella, 1994). If the identities are vastly different from identities assigned by salient others, those identities will not be validated and are not likely to become part of the individual’s overall self. Therefore, through social interaction, individuals affect and are affected by others in terms of their identity-constructions (Kelly, 1963).

## Intervention Context

The rationale for using constructivist theory to guide the intervention's context is because it emphasizes the extent to which social processes impact knowledge construction in general and self-knowledge specifically. The principal investigator (PI) will create an environment, based on constructivism, in which the intervention will occur. Small groups will be used to deliver the intervention components so that subjects will have the opportunity to affect and be affected by similar others. That is, subjects will be expected to give and receive feedback on their own physically active identity development as well as that of others.

Group facilitators will facilitate the discussion sessions. These facilitators will be trained in instructional principles based on constructivist theory. Group facilitator training will follow the instructional model for problem-based learning (Savery & Duffy, 2001). The principles of this model are in Table 6.

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TABLE 6. *Problem-based Learning Principles of Group Facilitation*

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1. Anchor all learning activities to a larger task or problem.
  2. Support the learner in developing ownership for the overall problem or task.
  3. Design an authentic task.
  4. Design the task and the learning environment to reflect the complexity of the environment they should be able to function in at the end of learning.
  5. Give the learner ownership of the process used to develop a solution.
  6. Design the learning environment to support and challenge the learners' thinking.
  7. Encourage the testing of ideas against alternative views and alternative contexts.
  8. Provide the opportunity for and support reflection on both the content learned and the learning process.
- 

Adapted from Savery, J. R. & Duffy, T. M. (2001). Problem based learning: An instructional model and its constructivist framework. CRLT Technical Report No. 16-01. Bloomington, IN: Indiana University.

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## Study Aims and Research Hypotheses

Specific Aim 1 is to determine if the development of physically active identities can be facilitated in a sample of older women. Hypothesis 1 is, "There will be a significantly greater

change in physically active identities at the end of the nine-week period in the intervention group compared to the attention-control group.”

Specific Aim 2 is to determine if facilitated physically active identities are associated with increased PA in a sample of older women. Hypothesis 2 is, “There will be a significantly greater increase in PA at the end of the nine-week study period in the intervention group compared to the attention-control group.”

Additionally, this study’s secondary aims include identifying the contexts of development (socio-cultural and environmental contexts) and individual characteristics (demographics, personal characteristics) of older women that contribute to the development of physically active identities.

### **Conclusion**

The theoretical concepts, including physically active identities and their antecedents, were reviewed. The conceptual model that describes the physically active identity development process was elucidated. Finally, the research hypotheses that will be tested in this study were identified.

## CHAPTER THREE: METHODOLOGY

In this chapter, the study methodology is discussed. The design, setting, sample, protection of human subjects, data collection, intervention and attention-control activities, and planned data analyses are described.

### Study Design

This study uses a quasi-experimental two-group pre-test post-test design. A quasi-experimental design tests descriptive causal hypotheses about manipulable causes, but lacks random assignment (Shadish, Cook, & Campbell, 2002). This design tests whether changes that occur in the dependent variables (physically active identities and PA) result from the manipulation of the independent variable (facilitation through the physically active identity development process).

### Power

Power was set at .80 based on Cohen's (1987) recommendations. The effect size for this study was large (.80), based on prior cognitive-behavioral intervention studies (Pinquart, Duberstein, & Lyness, 2007). According to Cohen's table, with significance set at  $p < .05$ , the required sample size was 52. In order to plan for subject attrition, a recruitment goal of 60 subjects was set.

### Study Fidelity

Study fidelity is defined as the methodological strategies used to monitor and enhance the reliability and validity of behavioral interventions (Bellg, et al., 2004). In order to maintain study fidelity, the following strategies were used: standardization of group activities, equivalence of group activities, and planning for implementation setbacks.

**Standardization of group activities.** Group activities were standardized for all the subjects (Bellg, et al., 2004). This was accomplished by developing discussion session scripts and using separate group facilitators for the intervention and attention-control groups. The facilitator working with intervention groups was trained to follow session scripts developed by the principal investigator (PI) and to avoid including other topics in discussion. The facilitator working with the attention-control groups was instructed to facilitate the dialogue between subjects and the Vermont Department of Health (VDH) staff who presented the discussion topics. Specific topics were identified for each session and the group facilitator was informed that PA cannot be mentioned in any part of the discussion.

**Equivalence of group activities.** The format and timing of intervention and attention-control groups' activities were equivalent (Bellg, et al., 2004). Activities were designed so that subjects had the same number, duration, and frequency of discussion sessions. Deviations from this (e.g. discussion sessions that are canceled due to unforeseen circumstances like severe weather or problems with the locations) would be noted and considered in light of study findings.

**Planning for implementation setbacks.** Implementation setbacks were planned for. Implementation setbacks include subject- or group facilitator-attrition (Bellg, et al., 2004). In order to plan for subject-attrition, subjects were divided into groups of ten individuals. Marcus and Forsyth (2003) recommends groups between 5 and 15 for the purpose of PA promotion. Thus, by using small groups of ten subjects each for this study, the small group dynamics would still be preserved even if only half of the group was in attendance. Subjects were also encouraged to participate through study incentives. Study incentives offered during the first weekly discussion session included a gift bag containing a water bottle, ink pen, pedometer, and written

study materials. Study incentives offered during each weekly discussion session included refreshments (e.g. coffee, fresh fruit, yogurt). Subjects were paid \$15 for enrolling in the study as compensation for their time, even if they dropped out or were withdrawn from the study.

In order to plan for group facilitator attrition, one group facilitator and one back-up facilitator were hired for each group. In the event that both the group facilitator and the back-up facilitator were unable to attend a group discussion session, the PI would act as the facilitator. To assess for any potential influences by the PI while acting as a group facilitator, all subjects were given the opportunity to evaluate the small group discussion sessions during week 9. If subjects identified the discussion sessions that were facilitated by the PI as their most or least favorite, this would be considered in light of study findings.

### **Internal Validity**

Several threats to internal validity exist. Ambiguous temporal precedence refers to the inability to determine if changes that occur in the dependent variable follow the manipulation of the independent variable (Trochim, 2006). To control for this threat, the PI excluded all women who were already participating in any motivational or PA interventions or studies. Selection threat refers to systematic differences over conditions in respondent characteristics that could cause the observed effects (Shadish, et al., 2002). This was a weakness of not randomizing subjects since there was the potential that the two groups would not be comparable (Friedman, Furberg, & DeMets, 1998). This threat could not be controlled, but data collected at baseline would be analyzed to determine the extent to which the groups were similar.

History threats refer to the historical events that could occur during the course of the study that might impact study findings (Shadish, et al., 2002). Maturation threat refers to

naturally occurring changes over time that could be confused with a treatment effect (Shadish, et al., 2002). Both history and maturation threats would be addressed by using an attention-control group for whom the same historical events occur and for whom maturation would be similar. Regression threat refers to when subjects are selected for their extreme scores. If a change in scores occurs following the introduction of the independent variable, this might be confused with a treatment effect (Shadish, et al., 2002). This threat would be controlled by using a convenience sample, rather than a sample chosen based on prior scoring.

Testing threat refers to repeated exposure to the same test, affecting subsequent test scores (Shadish, et al., 2002). To control for this threat, subjects in both the intervention and attention-control groups would repeat the same instruments, likely resulting in similar testing effects between groups. Instrumentation threat refers to the nature of a measure that may change over time that could be confused for a treatment effect (Shadish, et al., 2002). To control this threat, an attention-control group would be used. Changes over time in the dependent variables would likely be similar in both the intervention and attention-control groups. Diffusion of treatment refers to the attention-control group learning about the intervention group activities either directly or indirectly (Trochim, 2006). This threat would be controlled by holding all intervention activities at a single site, and holding attention-control activities at other sites located away from the intervention site.

### **Setting**

This study took place in an urban county in a New England state. According to the US Census (2007), Chittenden County, Vermont has a population of approximately 150,000. Of this, approximately 10% of the population is aged 65 or older. The total number of community-

dwelling women aged 50 or older living with at least one chronic condition in Chittenden County is 15,500 (VDH, 2008a). Roughly 94% of the county's residents are white, non-Hispanic. This county was chosen because it was the only urban area in the state and was the most likely county in which to recruit a sufficient sample.

### **Sample**

A convenience sample was used. Subjects were recruited by self-referral and by referrals from senior housing and senior center staff. The PI obtained permission to use senior housing and senior centers as recruitment and intervention activity sites before any study activities took place.

### **Recruitment Process**

Flyers were posted in common areas of senior housing and senior centers. Flyers stated the purpose of the study (to motivate PA), the eligibility criteria, and the PI's contact information. The study flyer was revised mid-way through recruitment process to stress that the study was a motivation for PA intervention rather than a PA intervention. See Appendix A. A short paragraph describing the study and listing the PI's contact information was placed in area senior newsletters and electronic bulletins. See Appendix B. The PI also made presentations about the study to older women's community groups. Individuals who self-referred contacted the PI by phone or email. Once the potential subjects contacted the PI, the PI screened them for eligibility criteria.

Individuals were also referred by housing and senior center staff. An eligibility script was created by the PI to assist the staff in explaining the study to potential subjects. The eligibility script was accompanied by the Permission to Release Name Form so that staff could give the

names and phone numbers of potential subjects to the PI. A business card was provided to staff to give to the potential subjects in case potential subjects wanted to contact the PI. See Appendix C. Once the PI received completed Permission to Release Name forms, the PI contacted the potential subjects by phone and screened them for eligibility criteria.

### **Eligibility Criteria Screening Process**

Eligibility criteria included being: 1) female, 2) at least age 50 with at least one clinically significant chronic condition, defined as those that require regular medical management (Nelson, et al., 2007) and have been present for 3 months or longer (National Center for Health Statistics, 2007), 3) able to speak, read, and write in English, 4) currently physically inactive, defined as no leisure-time PA in the previous month, 5) interested in becoming physically active, 6) available to participate in weekly hour-long small group discussions for a period of nine weeks, 7) not currently participating in any other cognitive-behavioral programs or studies, and 8) able and willing to participate in PA of their own choice. Those who responded “yes” to all of the aforementioned criteria were eligible to participate. The PI used an Eligibility Screening Form to document responses to each of the eligibility criteria with potential subjects. See Appendix D.

Once potential subjects were screened for eligibility, their names, addresses, and telephone numbers were recorded on the Eligibility Screening Form and a date for a home visit was scheduled. Individuals who did not meet the eligibility criteria were referred to Vermont’s *Healthier Living Workshops* as an alternative to participation in this study. These workshops are based on the Chronic Disease Self-Management Program (Lorig, et al., 1985) to help persons with chronic conditions better manage their health. This program is offered to Vermont residents for free (VDH, 2008b).

### **Inclusion and Exclusion Criteria Screening Process**

The PI made a home visit to potential subjects who passed the eligibility criteria screening. The purpose of the home visit was to screen potential subjects for inclusion and exclusion criteria following their consent to be screened. The Consent to Be Screened forms were mailed to potential subjects prior to the PI's home visit for their review. Potential subjects were informed that the home visits could take up to 1½ hours. Potential subjects were compensated \$5 for having been screened, even if they did not meet inclusion criteria. Inclusion and exclusion criteria screening tools are shown in Appendices E and F.

**Independent in ADLs.** The ADL screening tool was used to assess bathing, eating, toileting, dressing, transferring, and walking (Katz, et al., 1970). A score of 6 indicated full function. A score of 2 or less indicated severe functional impairment. This instrument has consistently demonstrated its utility in evaluating functional status in older adults, although no formal reliability and validity reports could be found in the literature (Wallace & Shelkey, 2007). The PI administered this instrument which took approximately 3-5 minutes to complete. Individuals who scored a 6 on the ADL Scale were eligible for this study.

**Limited in no more than two IADLs.** The IADL screening tool was used to assess telephoning, shopping, preparing food, housekeeping, laundering, mode transportation, self-medicating, and managing finances (Lawton & Brody, 1969). A summary score ranged from 0 (low function, totally dependent) to 8 (high function, independent). This instrument has demonstrated an inter-rater reliability of .85 (Graf, 2007). The PI administered this instrument which took approximately five minutes to administer. Individuals who scored at least 6 out of 8 on the IADL Scale were eligible for this study.

**Free of dementia.** The Mini-cog was used to screen individuals for dementia. The Mini-Cog includes a three-item recall and the clock drawing test. It is used to discriminate demented from non-demented persons in the general population (Doerflinger, 2007). It has demonstrated a sensitivity of 75-99% and a specificity of 89-96% with a 95% confidence interval in prior studies (Borson, Scanlan, Brush, Vitallano, & Dokmak, 2000; Scanlan & Borson, 2001). It has demonstrated an inter-rater reliability of .93 to .95 and has demonstrated construct validity with the mini-mental status exam (Harvan & Cotter, 2006). This instrument was administered by the PI which took about three minutes to administer. Individuals who scored 3 of 3 or 1-2 out of 3 with a normal clock drawing test were eligible for this study.

**Absence of contraindications to PA.** Contraindications to PA were assessed with two instruments. The first was the Exercise Assessment and Screening for You (EASY) Tool (Resnick, et al., 2008). Permission was granted by the authors of this tool prior to use. See Appendix H. The EASY tool contains six questions that screen for symptoms that increase the risk of injury for older adults who are beginning PA. Each question is answered with a “yes” or “no” response. If an individual answers “yes” to any one question, the EASY tool prompts the individual to identify whether or not the problem is acute or chronic in nature. If the problem is acute, the person is advised to see their health care provider before beginning PA. If the problem is chronic in nature and has already been assessed by their medical provider, an algorithm recommends specific PA programs that have demonstrated effectiveness for that symptom (Resnick, et al., 2008). Individuals were eligible for this study if they answered “no” to the EASY screening questions, or if they answered “yes” but the symptoms were chronic and were under supervision by their medical provider.

The second instrument was the Safety to Perform Physical Activity tool. This was created for the purpose of this study. The PI reviewed the warning signs of heart attack and stroke listed by the AHA (2008) and constructed a screening tool based on those warning signs. The tool was composed of fourteen questions that asked individuals if specific signs or symptoms of heart attack or stroke had been present over the past month and if those symptoms had been evaluated by their medical provider. Individuals were eligible for this study if they responded “no” to all of the Safety to Perform Physical Activity questions.

Vital signs (heart rate, BP, respirations) were also assessed to screen individuals for the presence of heart rates, BP, or respiration rates that might pose a safety risk. Individuals were eligible for this study if their heart rates were less than or equal to 100 beats/minute, their BP were less than or equal to 160/100 mm/Hg, and their respirations were less than or equal to 24 breaths/minute.

Women who met all of the inclusion criteria and none of the exclusion criteria were enrolled following their informed consent. Those who were not enrolled were informed that they would no longer be participating in this study. However, they were given information on Healthier Living Workshops (VDH, 2008b) as an alternative to participation in this study.

### **Human Subjects' Protection**

Prior to conducting this study, approval from the Human Subjects Protection Program at the University of Arizona was obtained. See Appendix G. Two consent forms were recommended. The first, the Consent to Screen, was used prior to screening potential subjects for inclusion and exclusion criteria. The second, the Informed Consent, was used in the enrollment process and was completed prior to the PI's collection of baseline data. Signed informed consent

forms were kept at the University of Arizona College of Nursing as required by the University of Arizona Human Subjects Protection Program. During the home visit, the PI reviewed the Informed Consent forms with potential subjects and answered any questions that they had. Once all questions were answered, the PI obtained informed consent as evidenced by each subject's signature on the consent form.

Subjects were informed that their participation was voluntary and that they could withdraw at any time without untoward consequences. Subjects were informed that other than their time commitment, there were no costs associated with participation. Subjects were compensated \$10 for their time upon the study's completion, even if they were withdrawn or dropped out of the study. Subjects were informed of potential benefits including receipt of study materials (pedometers, educational materials, water bottles, and refreshments), being motivated to perform PA, and, hopefully, realizing the benefits associated with PA.

Subjects were informed that there were minimal risks to participation in this study. Risks included experiencing negative social, psychological, and emotional effects from participation in the group discussions. Risks also included injuries associated with PA, including muscle soreness, injury, and even death, although that risk was extremely low. Subjects were informed that the recommended PA was of low- to moderate-intensity in order to reduce these risks. Subjects were encouraged to contact their medical providers if they were concerned about their safety prior to beginning PA. If subjects exhibited signs or described symptoms of medical emergencies during their participation in the group discussion sessions, study staff was instructed to call 9-1-1 for the subject and to remain with the subject until emergency medical personnel arrived.

Subjects were informed that their privacy would be respected throughout their participation. Subjects were informed that only the PI, the group facilitators, and small discussion group members would know that they were participating in a research study. All group facilitators and group members were instructed that the information shared by group members must be kept confidential. Subjects were also informed that all data collected during this study would be kept confidential and that personal identifiers would be destroyed following data collection. All data were kept in a locked file in the PI's residence and would be destroyed via shredding five years after the study analysis was completed.

### Data Collection Methods

Data was collected in three phases: Baseline, during Intervention/Attention-Control activities, and Week 9. See Figure 7.

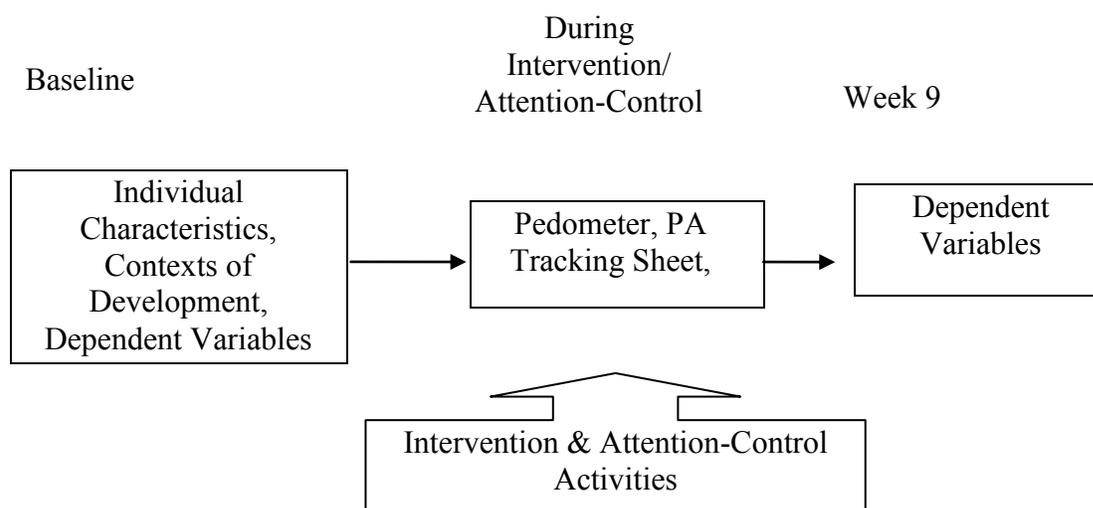


FIGURE 7. Data Collection Phases.

## Baseline

Baseline data were collected during the home visit after securing the informed consent. Baseline data included variables identified in the literature as influencing PA or identity. See Table 7. Subjects completed the forms shown in Appendix H. For ease of reading, forms were provided in Arial font size 14

TABLE 7. <i>Baseline Data</i>		
Demographics		
Variable	Instrument	Corresponding Questions
Age	Baseline Data Form	1
Health Status		7
Socio-economic Status		6
Prior PA History		12
Personal Characteristics		
Self-Esteem	Self-Esteem Scale	Whole Instrument
Ego-Resiliency	Ego-Resiliency Scale	Whole Instrument
Psychological Self- Monitoring	Psychological Self-Monitoring Scale	Whole Instrument
Socio-cultural Contexts		
Race	Baseline Data Form	4
Language		5
Marital Status		2
Employment		3
Appropriateness of PA		8
Environmental Contexts		
Safety to Perform Physical Activity	Baseline Data Form	9 a., b., c.
Access to Physical Activity		10, 11
Dependent Variables		
Physically Active Identity	Exercise Identity Scale	Whole Instrument
	Exercise Self Definition Scale	Whole Instrument
Physical Activity	International Physical Activity Questionnaire	Whole Instrument

**Demographics.** The Baseline Data Form was created for the purpose of this study. Demographic variables included age, health status, socio-economic status, and prior PA history. Subjects filled in their ages in question 1. To indicate health status, subjects circled one of the following responses: excellent, good, fair, or poor. To indicate their socio-economic status,

subjects circled one of the following responses: more than enough, enough, or less than enough. Subjects indicated their prior PA history by providing a yes or no response to the direct question, “Have you ever been physically active at any time in your life?” If subjects answered yes, they were asked kinds of activities they did.

**Personal characteristics.** Personal characteristics included self-esteem, ego-resiliency, and psychological self-monitoring. The Rosenberg Self-Esteem Scale (Rosenberg, 1965) was used to assess self-esteem. This instrument contained a ten-item Likert scale. Scores were summed to yield a total score ranging from 10 to 50. Higher scores indicated higher levels of self-esteem. This instrument has been used previously with older adults in general (McAuley, et al., 2005) and with older women specifically (Misra, et al., 1996). This instrument has been well validated in prior studies (McAuley, et al., 2005) and has demonstrated an internal consistency of Cronbach’s alphas greater than .83 (McAuley, et al., 2005; Misra, et al., 1996).

Block and Kremen’s (1996) Ego-Resiliency Scale was used to assess subjects’ ego-resiliency. This instrument contained a fourteen item Likert scale. Higher scores indicated higher levels of ego-resiliency. This instrument has been used previously with young adults between the ages of 18 and 40. To this author’s knowledge, it has not been used in older adults specifically. The construct validity of this scale was supported by the California Adult Q-sort (Block & Kremen, 1996). Reliability was demonstrated with alphas of .71 (Tugade & Fredrickson, 2004) and .76 (Block & Kremen, 1996) in prior studies.

The Psychological Self-Monitoring Scale, first developed by Snyder (1974), and later adapted by Gangestad and Snyder (1985), measured psychological self-monitoring. It has been used previously with college-aged adults, but it has not been used to date on older adults to this

author's knowledge. This instrument consisted of 18 items which were scored as either true or false. Items were scored to determine where individuals were on a high-low self-monitoring continuum. Validity of this instrument was supported with a factor analysis comparing the 18-item scale with an earlier 25-item version of the scale. Reliability of this instrument was supported with a Cronbach's alpha of .70.

**Socio-cultural contexts.** Socio-cultural contexts were assessed using the Baseline Data Form. Socio-cultural contexts measured the following variables: race, language spoken in the home, employment status, and beliefs about the appropriateness of PA for older women. Subjects circled the racial or ethnic background with which they identified. Subjects were allowed to select more than one race. Subjects indicated the language they spoke in their home. Subjects indicated their employment status by circling one of the following responses: full time, part time, not employed. Subjects were asked if PA was appropriate for older women. They indicated their beliefs by circling one of the following: absolutely, maybe, definitely not.

**Environmental contexts.** Environmental contexts were assessed using the Baseline Data Form. Subjects' safety to perform PA was assessed by four questions. The first asked how fearful are you that you will become injured as a result of performing PA? Subjects circled one of the following responses: very fearful, slightly fearful, neutral, not fearful. Subjects were then asked if they feared being injured by the PA itself. Subjects were asked if they feared being a victim of crime while performing PA. Finally subjects were asked if they were fearful of being injured by the environment while performing PA. Subjects circled one of the four aforementioned responses.

To assess subjects' access to PA, subjects answered the following question, "how far do you have to travel to perform PA?" Subjects indicated their answer by circling one of the following responses: less than a mile, 1 to 5 miles, or more than 5 miles. Next, subjects were asked to indicate how much trouble it would be to attend a PA class. Subjects circled one of the following responses: very much, some, or not at all.

**Dependent variables.** Subjects' baseline physically active identities were measured using the Exercise Identity Scale (EIS) (Anderson & Cychosz, 1994) and the Exercise Self Definition Scale (ESDS) (Hays, et al., 2005). Baseline PA was measured by the International Physical Activity Questionnaire (IPAQ) (Sjostrom, et al., 2002).

The EIS (Anderson & Cychosz, 1994) has nine statements to which respondents answer strongly disagree, disagree, neutral, agree, or strongly agree. This scale generates a numeric score with higher scores indicating higher exercise identities. It has been used with adults of all ages including adults over the age of 50 (Anderson, Cychosz, & Franke, 2001). Internal consistency was supported with a Cronbach's alpha of .94. All nine items of the EIS were significantly intercorrelated with item-total correlations ranging from .87 to .55. Validity was supported by positive correlations with the number of weeks of exercise participation, the frequency of exercise per week, the minutes of exercise per exercise session, and the intensity of exercise (Anderson & Cychosz, 1994).

The ESDS (Hays, et al., 2005) has been used with women aged 50 and older. The scale contains 11 questions which can be subdivided into three subscales: acknowledgement, value of exercise, competence. Acknowledgement refers to the individual's view of herself as an exerciser as well as her perceptions of how others view her as an exerciser. Value of exercise

refers to the perceived enjoyment of PA and the importance of PA. Competence refers to one's perceived ability to perform specific PA in comparison with others of the same age. Each subscale had a factor loading that exceeded 0.30. Reliability was supported for the total scale with a Cronbach's alpha of .86 and for each of the subscales with Cronbach's alphas of .88, .72, and .78 respectively. Validity was supported with factor analysis that yielded three factors (acknowledgment, value of exercise, and competence) accounting for 67% of the total variance. Correlations among the subscale scores ranged from .35 to .64.

The IPAQ was used to measure current PA. This seven-item instrument assessed individuals' duration and frequency of vigorous PA, moderate PA, walking, and sitting over the past seven days. It had been tested in 12 different countries using samples of middle-aged and older adults (Sjostrom, et al., 2002). The English version of the questionnaire has demonstrated a Spearman's correlation coefficient of .83 to .94 (Craig, et al., 2003).

### **During Intervention/Attention-Control Activities**

Data collected during the intervention and attention-control activities included subject tracking of their PA on PA Tracking Sheets. PA data included log data and pedometer step counts.

PA Tracking Sheets were used to record the type and duration of PA subjects participated in. See Appendix I. Tracking sheets were self-report measures similar to diaries or log data where subjects recorded data daily. Accuracy of this method was well supported although floor effects and recording bias have been described (Tudor-Locke, Williams, Reis & Pluto, 2004).

Pedometers were used to document steps performed per day. Pedometers have been shown to be practical, inexpensive, and feasible for use with older adults in community settings

(Cyarto, Myers & Tudor-Locke, 2004). Bassett and colleagues (1996) found that pedometers were accurate when used with adults with walking speeds between 2 and 4 miles per hour.

### **Week 9**

During week 9, all subjects' physically active identities were re-measured using the EIS and the ESDS. All subjects' PA was re-measured using the IPAQ. PA Tracking Sheets were collected. See Table 8.

**TABLE 8. Data Collected at Week 9**

Variable	Instrument
Physically Active Identity	EIS
	ESDS
Current PA	IPAQ
	PA Tracking Sheets

*Note:* EIS-Exercise Identity Scale, ESDS-Exercise Self Definition Scale, IPAQ-International Physical Activity Questionnaire, PA-physical activity

### **Intervention and Attention-Control Activities**

Following baseline data collection, subjects were assigned to either the intervention or attention-control group based on sites where they participated. The sites were randomized using a coin toss. Intervention and the attention-control groups were divided into small groups of 10 subjects each. The intervention and attention-control activities began for each group as soon as ten subjects were enrolled at each site. Intervention subjects received a nine-week intervention, guidance through the physically active identity development process, and participated in PA of their choice. Attention-control subjects received nine weeks of health education on various health topics unrelated to PA and participated in PA of their choice. All small group discussion sessions were facilitated by group facilitators hired and trained by the PI. During week 9, dependent variables were re-measured on all subjects.

### **Group Facilitator Training**

Group facilitators were trained so that the group processes for both the intervention and attention-control groups were standardized. Facilitators were paid \$25/hour which included their time spent during the small group discussions, on-line human subjects' protection training, and in-person group facilitation training. A total of four group facilitators were recruited by the PI. Two group facilitators were assigned to the intervention group and two group facilitators were assigned to the attention-control group.

First, group facilitators completed training on the protection of human subjects. This on-line training course was offered by the Collaborative Institutional Training Initiative (CITI) (2008). Next, group facilitators met for in-person training with the PI. During this training, facilitators reviewed human subjects' protection principles and principles of group facilitation. Materials adapted from Savery and Duffy (2001) and from Florida State University College of Medicine (2007) were used in the in-person training. See Appendix J. Opportunities were provided during group facilitation role-play so that each group facilitator could practice her facilitation skills. Facilitators indicated their readiness to function as facilitators on a training evaluation form.

### **Intervention Group Activities: Project I'm Possible**

The intervention group subjects were facilitated through the physically active identity development process over a period of nine weeks. The length of the intervention was chosen based on prior research on developing a physically active identity and prior behavioral interventions. Medina (1996) reports that physically active identities take an average of six months to develop in the presence of PA, although the time can range from "almost

immediately” to up to ten years. The Healthier Living Workshops (VDH, 2008b) occur over a six-week period. Therefore, this intervention was at the lower end of the identity formation range cited by Medina and was only slightly longer than the Healthier Living Workshops. Small group discussion session activities followed the Physically Active Identity Development Conceptual Model discussed in Chapter 2.

**Session 1: Orientation.** Intervention group subjects were oriented to the group discussion sessions. See Appendix K. Each subject introduced herself to the group and shared one activity she enjoyed doing. This was used to foster a social atmosphere among subjects. Next, subjects were informed of the PA options available to them. A local guide to area PA programs was provided and each subject was given the National Institute on Aging’s (2008) book, *Exercise: A Guide from the National Institute on Aging*. Subjects reviewed safety principles related to PA including when PA should not be initiated and when PA should be immediately stopped (e.g. chest pain). Subjects were oriented to the pedometer and the pedometer calculations. Lastly, all subjects were oriented to the PA Tracking Sheets and were instructed to record the type, amount, and frequency of PA they performed as well as their daily step-counts.

**Session 2: Imaging.** Intervention group subjects were guided through imaging, defined as constructing images of the self as desired ways of being and the creation of action statements based on those ways of being (Fleury, 1991). The following sentence was written on a large easel pad, “Describe a physically active older woman.” This question was intended to elicit prototypes of a physically active older woman. The facilitator read this question aloud and subjects

responded. Subjects were asked to discuss the positive and negative prototypes that were mentioned.

Next, possible selves were described by the facilitator reading the following statement, adapted by Whaley (2003) from the *Possible Selves Questionnaire* (Cross & Markus, 1991):

*“We all think about our future to some extent. When doing so, we usually think about the kinds of experiences that are in store for us and the kinds of people we might possibly become. Sometimes we think about what we hope we will be like-selves we hope to become in the future, or “hoped-for possible selves.”*

Next, the *Possible Selves Questionnaire* (Cross & Markus, 1991), adapted to the physically active domain (Whaley, 2003) (PSQ-PA) was administered. Once the PSQ-PA was completed, subjects constructed action statements using the Goal Setting Worksheet. Subjects shared their possible selves in the physically active domain and their action statements with the group. See Appendix L.

**Session 3: Understanding expectations and beliefs.** Intervention group subjects described their expectations and beliefs about PA. Expectations and beliefs were pre-existing cognitions that individuals had about PA and their abilities to perform PA. These included general beliefs about PA, PA self-efficacy, and prior PA experiences.

First, the following question was written on a large easel pad, “What is physical activity?” Subjects responded to the question and their responses were recorded on the easel pad. The four fitness categories (aerobics, muscle strengthening, flexibility, and balance) were described to the group and examples of each category were provided. Second, subjects were asked the following question, “How capable are you in performing any of the physical activity choices listed here?” (pointing to the easel pad with the list of PA compiled by subjects). Each subject shared her perceived self-efficacy associated with any number of PA options with the

group. Finally, subjects described their prior experiences with PA. Subjects were encouraged to share their experiences with the group.

**Sessions 4 and 5: Experimenting.** Experimenting, defined as taking “small steps” toward performing a new behavior (Kearney & O’Sullivan, 2003), took place over two sessions to allow subjects sufficient time to experiment with different PA options. During each session, the following definitions were written on the easel pad:

1. Investing is the time, energy, and resources I have expended in my pursuit of PA.
2. Competing forces are the things I would rather be doing, the other commitments I have, and the people who want me to do things other than PA.

Each subject described the PA she participated in, how she felt about her participation in that PA, the investments of time, energy, and resources she made in pursuit of that PA, and the competing forces that were actual or potential obstacles for her continuation of PA. As subjects responded, subjects’ examples of their interim evaluations, investments, and competing forces were recorded on the easel pad. Once all subjects responded, subjects selected a specific competing force, identified ways to overcome that competing force, and identified ways to increase investments made in PA.

**Session 6: Assessment of affective, cognitive, and physical outcomes.** This session was described to subjects as the stage where they must weigh their involvement in PA more seriously. The following question was asked, “Do the rewards of PA outweigh the costs?” Subjects described their assessment of affective, cognitive, and physical outcomes. Examples of each type of outcome were identified by the group facilitator. For affective outcomes, the example of a positive outcome was feelings of satisfaction and a negative outcome was boredom.

For cognitive outcomes, the example of a positive outcome was feeling in control and a negative outcome was feeling a lack of control. For physical outcomes, the example of a positive outcome was weight loss and a negative outcome was muscle soreness. After all subjects responded, negative outcomes were noted and group members identified ways to lessen or avoid those outcomes. The following example of resolving a negative outcome was given. “One negative physical outcome might be muscle soreness or pain following PA. Muscle soreness can be reduced by doing a „cool-down“ activity.”

**Session 7: Identity consolidation.** Identity consolidation was defined as the integration of new facets of one’s identity into a coherent whole (Grotevant, 1987). This session was described by group facilitators as the stage where individuals might begin to see themselves in a “new light,” or where individuals might now consider their lifestyle as having “new normal.” The following statements, based on descriptions of Marcia’s (1966) identity statuses, were written on the easel pads:

1. I have made a commitment to this new sense of self that I have chosen (identity achievement).
2. I am still exploring my various commitments and options (identity moratorium).
3. I am willing to make a commitment to achieving a new self but have not begun doing so yet (identity foreclosure).
4. I don’t feel like I have any choices. Therefore, I haven’t committed to achieving a new self (identity diffusion).

The labels of each identity status were not written on the easel pads so as to not influence subjects' selection. Subjects identified with which statement described them best. Group members were asked to either validate or invalidate other group members' self-selections.

**Session 8: Identity evaluation.** Subjects identified similarities, if any, between how they perceived themselves as being physically active and how they were perceived in reference to PA by their salient others. The following questions were asked, "How would you describe yourself in terms of being physically active now?" and "How would the people who are important to you describe you now in terms of being physically active? Group members were asked to identify ways to resolve any discrepancies between how subjects described themselves and how their salient others described them in terms of being physically active.

**Session 9: Graduation.** Intervention group subjects described their PA progress to date. PA Tracking Sheets were collected and copies were given to subjects to keep for their own records. Four questionnaires, the EIS, the ESDS, the IPAQ, and the Study Evaluation form, were administered. The Study Evaluation Forms are shown in Appendix M. These were created for two reasons. First, the forms provided subjects with an opportunity to evaluate the intervention and attention-control activities. Second, they provided a way to assess whether or not the PI, acting as a group facilitator, influenced the discussions.

#### **Attention-Control Activities: Health R Us**

Attention-control subjects received health education over a nine-week period. An attention-control activity was intended to provide a "placebo" activity of identical frequency and duration as the intervention (Gross, 2005). Health education topics were unrelated to PA but

were still pertinent to older women's health. Group discussion sessions were facilitated by a group facilitator but the health-related content was provided by VDH staff or their designee.

Sessions 1 and 9 were identical to the intervention group. Sessions 2 through 8 were on various health topics based on availability of speakers and timeliness of the subject matter (e.g. cold and flu prevention during cold and flu season). See Appendix N. Attention-control subjects were informed that they could participate in the intervention, *Project I'm Possible*, if they wished and could contact the PI to discuss when this would take place.

### **Analysis Plan**

The analysis plan includes the data preparation and entry, review of findings from the intervention groups' small group discussion sessions, descriptive statistics, and hypothesis testing. Each is discussed below.

#### **Data Preparation and Entry**

Baseline data forms were reviewed by the PI for completeness. Missing data was handled by the PI reviewing each questionnaire at the time of its completion. If any items on any of the questionnaires were left blank, the PI asked the subject to complete the item. Surveys re-administered during the last small group discussion session were not reviewed by the PI as they were administered by group facilitators. The surveys and PA Tracking Sheets were collected by group facilitators during the last discussion session.

All de-identified data were entered into a computer database (IBM SPSS Statistics Base Grad Pack 18 for Windows). A codebook was kept by the PI which described the data that was collected and indicated where in the database this data was stored. As data were entered into the database, double entry was used. Double entry referred to the process of entering the data in two

separate datasets. Each dataset was checked against the other (Trochim, 2006). Any discrepancies were corrected by the PI comparing the datasets to the original questionnaires and study forms to resolve the discrepancy.

### **Baseline Data and Descriptive Statistics**

Baseline data were analyzed to describe the sample using summary statistics. These data included age, socio-economic status, health status, self-esteem, ego-resiliency, self-monitoring, prior PA history, physically active identities, current PA, race, primary language spoken in the home, marital status, employment history, beliefs about appropriateness of PA for older women, safety to perform PA, and access to PA. The means and standard deviations were calculated for continuous data. Significance testing using t tests was performed on continuous data. Significance was set at  $p < .05$ . Chi square analysis was used for categorical data. Cronbach's alpha was calculated for the self-esteem, ego-resiliency, self-monitoring, and physically active identity scales. Baseline data were tested to determine which, if any, were significantly different. Those variables found to be significantly different at baseline were used as covariates during hypotheses testing.

### **Intervention Group's Qualitative Data**

Qualitative data from each of the intervention groups' small group discussion sessions were collected by group facilitators using large easel sheets. During each discussion session, specific questions were written on the easel sheets and subjects were asked to comment. Subject comments were recorded on the easel sheets by group facilitators and given to the PI at the end of the discussion sessions. The PI compiled all of the qualitative data into a Word document according to the stage of the conceptual model that was being discussed when the comment was

made. Easel sheets were kept in a locked file in the PI's home and will be shredded once the study is defended.

### **Physical Activity Tracking Sheet Data**

In order to quantify PA, subjects were instructed to document their PA (including the type, frequency, and duration) and pedometer step counts on a daily basis using the PA Tracking Sheets. Subjects' PA was categorized by purpose (household, occupation, transportation, and leisure-time) for each week. If no entry was made for particular week, the subject was dropped from analysis for that week. Chi-square analyses were run to determine if significant differences existed between the intervention and attention-control groups.

Subjects were instructed to use their pedometers from the time they woke up until they went to bed. Each day, subjects were to record their daily steps onto the PA Tracking Sheets. If a minimum of three pedometer step count entries per week were available for a subject, those entries were summed and the means calculated. If there were not at least three entries for a particular week for a particular subject, the PI dropped the subject from the analysis for that week.

### **Hypotheses Testing**

To test the study's two hypotheses, mixed design 2X2 repeated measures ANOVAs were used. The first factor TIME had two levels (baseline and week 9) and the second factor GROUP had two levels (intervention and attention-control). The presence of an intervention effect was indicated by a significant TIME by GROUP interaction (i.e. a greater change in the intervention group baseline to week 9 than in the control group). Significance was set at  $p < .05$ .

**Hypothesis 1: There will be a significantly greater change in the association with physically active identities at the end of the nine-week study period in the intervention group compared to the attention-control group.** To test this hypothesis, a mixed design 2X2 ANOVA was planned with the EIS scores and the ESDS total and subscale scores. This hypothesis was supported if the intervention group had a significantly greater change in their association with physically active identities compared with the attention-control group on *both* the EIS and ESDS scores. This hypothesis was partially supported if there was a significant intervention effect for *either* the EIS or ESDS scores.

**Hypothesis 2: There will be a significantly greater increase in PA at the end of the nine-week study period in the intervention group compared to the attention-control group.** To test this hypothesis, a mixed design 2X2 ANOVA were planned on the total IPAQ scores and the PA and pedometer step counts documented on the PA Tracking Sheets. This hypothesis was supported if there was a significant intervention effect on *all* of the following: the IPAQ scores, pedometer step counts, and types of PA documented on the PA Tracking Sheets. This hypothesis was partially supported if the intervention effect was significant in at least *one* of the PA measures.

### **Secondary Aims**

Additionally, the following secondary aims include: 1) Identify the contexts of development for sedentary older women contributing to the development of physically active identities; 2) Identify individual characteristics of sedentary older women contributing to the development of physically active identities. To address these aims, the relationships between

physically active identities and contextual variables will be assessed using correlations matrix analyses.

### **Conclusion**

In this chapter, the study methodology was described. The design, sample, protection of human subjects, data collection, and data analyses were discussed.

## **CHAPTER FOUR: RESULTS**

In this chapter, the results of the study are presented. Despite best recruitment efforts, the expected sample size was not obtained. Therefore, the analysis plan includes an analysis of those who completed the study (completers) and those who did not complete the study (non-completers) in addition to the planned analysis for the intervention and attention-control groups. Included in this chapter are the subject recruitment, assignment, and attrition, baseline data analysis of completers versus non-completers and intervention versus attention-control groups, analysis of the PA data collected by the completers, and hypothesis testing and secondary aims analyses. Because the study was underpowered, the threat to statistical conclusion validity is discussed in relation to significance testing.

### **Site Selection**

In order to identify sites where the recruitment and study activities could be held, the PI contacted the local Area Agency on Aging (AAA). The AAA staff provided contact information for senior centers and senior housing located in Chittenden County, Vermont. The PI contacted all of the senior centers and senior housing staff to inquire whether or not it would be possible to recruit subjects and conduct study activities at their facilities. A total of two senior centers and six senior housing facilities agreed to participate. Therefore, the PI used a total of eight sites to conduct subject recruitment.

Study activities were held at sites where there were 10 subjects enrolled. Of the eight sites used for subject recruitment, only three sites (one senior center, two senior housing facilities) had enough subjects enrolled to begin study activities. These three sites were located within three miles of each other and served individuals of similar age, SES, and educational

levels. Sites were designated as intervention or attention-control sites based on a coin toss. Results of the coin toss were that the intervention groups (n=2) were both located at one senior center and the attention-control groups (n=2) were located in two different senior housing facilities.

### **Sample Recruitment, Assignment, and Attrition**

#### **Sample Recruitment**

Recruitment activities were conducted for a total of 12 months. The PI undertook several different strategies to recruit the sample. Strategies included posting flyers in common areas of senior housing and senior centers, seeking referrals from senior housing and senior center staff, making presentations to older women's groups, seeking referrals from health care providers, and posting a paragraph in community newsletters. See Table 9 for a summary of these strategies and the number of responses that each strategy generated.

The total number of women who responded to recruitment efforts was N=55. The most effective recruitment strategy (see Table 9) used in this study was the receipt of referrals from senior center and senior housing staff, accounting for over half (n=29) of all respondents. The least effective strategy was posting a paragraph in community newsletters, which generated only 1 response. Although not anticipated, four subjects referred friends to the study. Difficulties with recruitment are further explored further in Chapter 5.

TABLE 9. *Recruitment Strategies and Number of Responses*

Recruitment Strategies	Number of Responses
Study Flyers	8
Referrals from Senior Housing and Senior Center Staff	29
Presentations to Older Women's Groups	5
Referrals from Healthcare Providers	8
Community Newsletter Paragraph	1
Referrals from Subjects	4
Total Respondents	55

Of the 55 women who responded to study recruitment, n=4 did not meet eligibility criteria. Reasons for not meeting eligibility criteria included not being able to read or write in English (n=1) and not meeting the definition of physically inactive (n=3). Fifty-one women met eligibility criteria and were consented to be screened. Eight women were excluded following screening for inclusion and exclusion criteria. Reasons for being excluded included having at least one ADL limitation and having contraindications to PA. A total of N=43 was enrolled in the study. This enrollment fell short of the desired sample size of N=60 that was needed for the planned data analyses.

### **Sample Assignment**

Subject assignment was based on the site where subjects chose to participate. Subjects were divided into small groups for the purpose of receiving the intervention and attention-control activities. Groups began as soon as there were approximately 10 subjects enrolled at a study site. Subjects enrolled at sites where there were only a few subjects enrolled were given the option to join groups at other sites. Where subjects chose to participate was based on their individual preference. A total of two intervention groups and two attention-control groups were held. The intervention group activities took place in a multi-purpose room at a local senior center. The

attention-control group activities took place in multi-purpose rooms in 2 different senior housing facilities. Of the 43 subjects who were enrolled in the study, 17 were assigned to the intervention group. Thirteen were assigned to the attention-control group. Thirteen subjects dropped out before being assigned to an intervention or attention-control group.

### Subject Attrition

Of the 43 subjects who were enrolled in this study, over half (N=22) dropped out before study completion. Table 10 shows subject attrition.

TABLE 10. *Subject Attrition*

	Total Subjects Enrolled	Total Subjects Who Completed Study	Total Subjects Who Did Not Complete Study
Study Total	N=43	N=21	N=22
Intervention	N=17	N=12	N=5
Attention-Control	N=13	N=9	N=4
Never Began Study Activities			N=13

*Note:* Those who never began study activities were not assigned to either an intervention or attention-control group.

**Intervention group.** There were a total of two intervention groups. The first intervention group had a total of nine women, seven of whom completed study activities. One woman dropped out due to worsening health and one woman dropped out due to caregiving responsibilities. The second intervention group had a total of eight subjects, five of whom completed study activities. One woman dropped out due to transportation issues, one dropped out due to worsening health, and one dropped out without providing a reason. Of the 12 subjects that completed the intervention, seven attended all nine small group discussion sessions, two completed eight of nine sessions, two completed seven of nine sessions, and one completed six of nine sessions. Reasons for missing small group discussion sessions included minor health

problems (e.g. minor infections), community responsibilities, out of town visitors, and bad weather.

**Attention-control group.** A total of two attention-control groups were held. The first attention-control group consisted of seven subjects, five of whom completed study activities. One woman dropped out due to caregiving responsibilities and one woman dropped out due to worsening health. The second attention-control group consisted of six subjects, four of whom completed study activities. One woman dropped out for health reasons and one woman dropped out stating, “this is not for me.” Of the nine subjects who completed the study, five attended all nine small group discussion sessions, two attended eight of nine sessions, and two attended seven of nine sessions. Reasons for missing small group discussion sessions included minor illnesses and family members’ illnesses.

**Enrolled but never began study activities.** Thirteen women were enrolled but never began study activities. Reasons for this included becoming ill after enrolling but before study activities began (n=4), changing mind about participating (n=2), and not having enough subjects to hold study activities at a particular site (n=7).

### **Descriptive Analysis of Baseline Data**

Prior to data analyses, reliability testing was performed on the eight scales used at baseline. See Table 11 for the univariate variable descriptions and Cronbach’s alphas. The total sample was used to calculate floor and ceiling effects since there were no significant differences between completers and non-completers in physically active identity scores. Floor effects were seen with the ESDS-acknowledgement subscale and ceiling effects were seen for all of the physically active identity measures (EIS scores, ESDS total and all three subscale scores) for

some subjects. This is discussed further in Chapter 5 under Study Limitations. Cronbach's alphas were calculated on the total sample (N=43) with the exception of the ESDS scale which was missing for one subject so this was based on N=42. Alphas ranged from a low of .693 (Psychological Self-monitoring Scale) to a high of .956 (ESDS-acknowledgement).

Baseline data reflected subjects' contexts of development, individual characteristics, and dependent variables. First, data was analyzed according to those subjects who completed the study (completers, n=21) versus subjects who dropped out of the study (non-completers, n=22). Second, baseline data were analyzed for the intervention (n=12) versus the attention-control (n=9) groups.

TABLE 11. *Univariate Variable Description and Reliability Testing of Scales for Total Number Screened and Enrolled (N=43)*

Scale	N Used in Analysis	Number of Items	Possible Range	Observed Range	Floor Effects % (N)	Ceiling Effects % (N)	Mean (SD)	Median	Inter-quartile Percentile Values (25%- 75%)	Skewness	Kurtosis	Cronbach's Alpha
Self-esteem Scale	43	10	5-50	25-50	-	6.9 (3)	38.74 (6.60)	39	34-43	-.608	-.141	.818
Ego-resiliency Scale	43	14	14-56	28-56	-	2.3 (1)	43.56 (7.47)	43	37-50	-.949	-.095	.853
Self- monitoring Scale	43	18	0-18	0-13	4.6 (2)	-	6.00 (3.32)	5	4-8	-.619	.339	.693
EIS	43	9	9-45	14-45	-	6.9 (3)	29.67 (8.22)	28	23-35	-.573	.186	.895
ESDS total	42	11	0-110	27-110	-	4.8 (2)	63.38 (25.20)	61	42.5-85.25	-.989	.363	.921
ESDS-acknow	42	4	0-40	0-40	9.5 (4)	4.8 (2)	17.24 (12.32)	14.5	8-27.75	-.958	.396	.956
ESDS-value	42	4	0-40	12-40	-	7.1 (3)	28.95 (8.07)	30	21-35	-.953	-.406	.746
ESDS-comp	42	3	0-30	1-30	-	7.1 (3)	17.19 (8.24)	17.5	10.75-22	-.679	-.266	.803

*Note:* Self-esteem Scale-higher scores indicate higher self-esteem; Ego-resiliency Scale-higher scores indicate higher ego-resiliency; Self-monitoring Scale-higher scores indicate higher psychological self-monitoring; EIS-Exercise Identity Scale, higher scores indicate higher physically active identities, desired direction high; ESDS total-Exercise Self Definition Scale (total scale), higher scores indicate higher physically active identities, desired direction high; ESDS-acknow-Exercise Self Definition Scale-acknowledgment Subscale, higher scores indicate greater association with the term “exerciser,” desired direction high; ESDS-value-Exercise Self Definition Scale-value Subscale, higher scores indicate greater value of physical activity, desired direction high; ESDS-comp-Exercise Self Definition Scale-competence Subscale, higher scores indicate greater competence for physical activity, desired direction high; SD-standard deviation

### **Completers vs. Non-completers**

Data obtained at baseline on all the subjects enrolled in the study (N=43) were analyzed according to completers (n=21) and non-completers (n=22). Completers included subjects who were assigned to the intervention (n=12) and attention-control (n=9) groups who completed study activities over the nine-week period. Non-completers included subjects who were assigned to the intervention group but dropped out before the study was completed (n=5), subjects assigned to the attention-control group but who dropped out before the study was completed (n=4), and subjects who were never assigned to a group (n=13).

**Contexts of development.** Variables describing contexts of development are presented in Table 12. The majority of subjects in both groups (completers n=18, non-completers n=20) were Caucasian which is representative of the county where the study was conducted. All subjects in both groups (N=43) spoke English in the home. All subjects in both groups (N=43) stated that PA was appropriate for older women. For marital status, six in each group were single. Six non-completers and two completers were married, and seven completers and six non-completers were divorced. Six completers and four non-completers were widowed. The majority of subjects in both groups (completers n=16, non-completers n=18) were unemployed.

For general fear about performing PA, most subjects in both groups felt neutral (completers n=4, non-completers n=3) or not fearful (completers n=9, non-completers n=10). For fear of PA itself, the majority of subjects reported feeling neutral (completers n=2, non-completers n=3) or not fearful (completers n=11, non-completers n=13). For fear of being a victim of crime, the majority of subjects in both groups reported feeling not fearful (completers n=15, non-completers n=13). For fear of the environment, 4 subjects in each group were very

fearful. Seven completers and six non-completers were slightly fearful. Three completers and 1 non-completer were neutral. Seven completers and 11 non-completers were not fearful. The majority of subjects (completers n=19, non-completers =16) reported traveling less than a mile to access PA. Most subjects reported either some trouble (completers n=6, non-completers n=11) or no trouble (completers n=11, non-completers n=19) in accessing PA.

TABLE 12. *Completers vs. Non-completers: Contexts of Development (N=43)*

Variable	Completers N=21			Non-completers N=22		
	N (%)	Skewness	Kurtosis	N (%)	Skewness	Kurtosis
Race	18 (85.7) Caucasian	-	-	20 (90.9) Caucasian	-	-
	1 (4.8) Native American			1 (4.5) Black		
	2 (9.5) Multi-racial			1 (4.5) Multi-racial		
Language Spoken in the Home	21 (100) English	-	-	22 (100) English	-	-
PA Appropriate for Older Women	21 (100) Absolutely	-	-	22 (100) Absolutely	-	-
Marital Status	6 (28) Single	-	-	6 (27.3) Single	-	-
	2 (9.5) Married			6 (27.3) Married		
	7 (33) Divorced			6 (27.3) Divorced		
	6 (28.6) Widowed			4 (18.2) Widowed		
Employment	1 (4.8) Full Time	-	-	1 (4.5) Full Time	-	-
	4 (19) Part Time			3 (13.6) Part Time		
	16 (76.2) Unemployed			18 (81.8) Unemployed		
General Fear About Performing PA	3 (14.3) Very Fearful	-0.475	-1.246	3 (13.6) Very Fearful	-0.426	-1.382
	5 (23.8) Slightly Fearful			6 (27.3) Slightly Fearful		
	4 (19) Neutral			3 (13.6) Neutral		
	9 (42.9) Not Fearful			10 (45.5) Not Fearful		
Fear of PA Itself	2 (9.5) Very Fearful	-0.578	-1.277	2 (9.1) Very Fearful	-1.017	-0.391
	6 (28.6) Slightly Fearful			4 (18.2) Slightly Fearful		
	2 (9.5) Neutral			3 (13.6) Neutral		
	11 (52.4) Not Fearful			13 (59.1) Not Fearful		
Fear of Crime	1 (4.8) Very Fearful	-1.373	.405	3 (13.6) Very Fearful	-1.027	-0.487
	4 (19.0) Slightly Fearful			3 (13.6) Slightly Fearful		
	1 (4.8) Neutral			3 (13.6) Neutral		
	15 (71.4) Not Fearful			13 (59.1) Not Fearful		
Fear of Environment	4 (19.0) Very Fearful	-0.001	-1.499	4 (18.2) Very Fearful	-0.369	-1.641
	7 (33.3) Slightly Fearful			6 (27.3) Slightly Fearful		
	3 (14.3) Neutral			1 (4.5) Neutral		
	7 (33.3) Not Fearful			11 (50) Not Fearful		
How Far to Travel	19 (90.5) < 1 mile	3.530	12.578	16 (72.7) < 1 mile	1.097	-0.887
	1 (4.8) 1-5 miles			6 (27.3) 1-5 miles		
	1 (4.8) > 5 miles					
How Much Trouble	4 (19.0) Very Much	-0.707	-1.002	1 (4.5) Very Much	-0.379	-0.626
	6 (28.6) Some			11 (50) Some		
	11 (52.4) Not at All			19 (45.5) Not at All		

*Note:* Completers-those assigned to the intervention or attention-control groups and who completed the study activities. Non-completers-those were assigned to the intervention and attention-control group but who dropped out before the end of the study and the subjects who were never assigned to either an intervention or attention-control group. PA-physical activity.

**Individual characteristics.** Individual characteristics are described in Table 13. The majority of subjects (completers  $n=16$ , non-completers  $n=12$ ) reported their health as good. For SES, the majority of subjects (completers  $n=16$ , non-completers  $n=15$ ) stated they had “enough,” although four non-completers and two completers reported having less than enough. Most subjects (completers  $n=18$ , non-completers  $n=21$ ) reported having prior PA histories. Ages ranged from 53 to 99 years (mean 68.82,  $SD=13.10$ ) for completers and from 50 to 83 years (mean 65.05,  $SD=9.31$ ) for non-completers.

Scores for the Self-esteem Scale can range from 5 to 50. Scores below 15 suggest low self-esteem (Rosenberg, 1965). Self-esteem scores ranged from 25 to 49 for completers (mean 37.52,  $SD=5.94$ ) and from 26 to 50 for non-completers (mean 39.55,  $SD=7.61$ ). Scores for the Ego-resiliency Scale can range from 14 to 56. Higher scores reflect higher ego-resiliency (Block & Kremen, 1996). The scores ranged from 30 to 55 for completers (mean 43.19,  $SD=8.05$ ) and from 28 to 56 for non-completers (mean 43.82,  $SD=7.16$ ). Scores for the Psychological Self-monitoring Scale can range from 0 to 18. Scores greater than 11 are considered high and scores less than 10 are considered low (Gangestad & Snyder, 1985). Completers’ scores ranged from 0 to 13 (mean 6.43,  $SD=3.65$ ) Non-completers’ scores ranged from 0 to 12 (mean 5.82,  $SD=3.14$ ).

TABLE 13. *Completers vs. Non-completers: Individual Characteristics (N=43)*

		Completers N=21				Non-completers N=22				
Variable	N (%)		Skewness	Kurtosis	N (%)		Skewness	Kurtosis		
Health Status	1 (4.8) Excellent		.495	1.497	3 (13.6) Excellent		-.212	-.554		
	16 (76.2) Good				12 (54.5) Good					
	4 (19.0) Fair				7 (31.8) Fair					
SES	3 (14.3) > Enough		-.130	1.864	3 (13.6) > Enough		.014	.510		
	16 (76.2) Enough				15 (68.2) Enough					
	2 (9.5) < Enough				4 (18.2) < Enough					
Prior PA History	18 (85.7) Yes		-	-	21 (95.5) Yes		-	-		
	3 (14.3) No				1 (4.5) No					
Variable	Observed Range	Mean (SD)	Median	Skewness	Kurtosis	Observed Range	Mean (SD)	Median	Skewness	Kurtosis
Age	53-99	68.62 (13.10)	63	.838	-.036	50-83	65.05 (9.31)	64	.272	-.662
Self-esteem	25-49	37.52 (5.94)	38	-.390	.350	26-50	39.55 (7.61)	39	-.206	-1.085
Ego-resiliency	30-55	43.19 (8.05)	41	.172	-1.373	28-56	43.82 (7.16)	43.5	-.428	-.173
Self-monitoring	0-13	6.43 (3.65)	6	.238	-.797	0-12	5.82 (3.14)	5	.418	-.280

*Note:* Completers-those assigned to the intervention or attention-control groups and who completed the study activities. Non-completers-those were assigned to the intervention and attention-control group but who dropped out before the end of the study and the subjects who were never assigned to either an intervention or attention-control group. SES-socioeconomic status, PA-physical activity SD-standard deviation; Self-esteem Scale possible range 5-50, higher scores indicate higher self-esteem; Ego-Resiliency Scale possible range 14-56, higher scores indicate higher ego-resiliency; Self-monitoring Scale possible range 0-18, higher scores indicate higher levels of psychological self-monitoring.

**Dependent variables.** Descriptive analyses for dependent variables are presented in Tables 14 and 15. Scores for the EIS can range from 9 to 45. Higher scores indicate higher physically active identities (Anderson & Cychosz, 1994). The EIS scores ranged from 14 to 45 (mean 27.81, SD=7.81) for completers. The EIS scores ranged from 17 to 45 (mean 30.91, SD=8.61) for non-completers.

Scores for the ESDS total scale can range from 0 to 110. Higher scores indicate higher physically active identities (Hays, et al., 2005). The scores for completers ranged from 27 to 100 (mean 58.38, SD=21.97) and the scores for non-completers ranged from 30 to 110 (mean 68.38, SD=27.69).

The scores for the ESDS-acknowledgement subscale can range from 0 to 40. Higher scores indicate greater association with the term “exerciser” (Hays, et al., 2005). The scores ranged from 0 to 35 (mean 15.24, SD=10.77) for completers. Scores ranged from 0 to 40 (mean 19.24, SD=13.66) for non-completers. Scores for the ESDS-value scale can range from 0 to 40. Higher scores indicate greater value of PA (Hays, et al., 2005). Scores for completers ranged from 14 to 40 (mean 26.39, SD=8.24) and scores for non-completers ranged from 12 to 40 (mean 31.05, SD=6.92). The scores for the ESDS-competence subscale can range from 0 to 30. Higher scores indicate greater competence for PA (Hays, et al., 2005). The completers’ scores ranged from 5 to 30 (mean 16.76, SD=6.41). The non-completers’ scores ranged from 1 to 30 (mean 17.62, SD=9.89).

TABLE 14. *Completers vs. Non-completers: Baseline Physically Active Identity Scores (N=43)*

Variable	Completers N=21					Non-completers N=22				
	N Used for Analysis	Observed Range (Median)	Mean (SD)	Skewness	Kurtosis	N Used for Analysis	Observed Range (Median)	Mean (SD)	Skewness	Kurtosis
EIS	21	14-45 (27)	27.81 (7.81)	.108	-.195	22	17-45 (30.5)	30.91 (8.61)	.167	-.883
ESDS total	21	27-100 (59)	58.38 (21.97)	.521	-.580	21	30-110 (66)	68.38 (27.69)	.108	-1.286
ESDS-acknow	21	0-35 (14)	15.24 (10.77)	.410	-.740	21	0-40 (18)	19.24 (13.66)	.242	-1.295
ESDS-value	21	14-40 (23)	26.38 (8.24)	.149	-1.453	21	12-40 (31)	31.05 (6.92)	-1.079	1.448
ESDS-comp	21	5-30 (18)	16.76 (6.41)	-.155	-.427	21	1-30 (17)	17.62 (9.89)	-.373	-1.056

*Note:* Completers-those assigned to the intervention or attention-control groups and who completed the study activities. Non-completers-those assigned to the intervention and attention-control group but dropped out before the end of the study and those never assigned to an intervention or attention-control group. SD-standard deviation, EIS-Exercise Identity Scale (possible range 9-45; higher scores indicate higher physically active identities), ESDS total-Exercise Self Definition Scale (total scale, possible range 0-110; higher scores indicate higher physically active identities), ESDS-acknow-Exercise Self Definition Scale-acknowledgement subscale (possible range 0-40, higher scores indicate greater association with the term “exerciser”), ESDS-value-Exercise Self Definition Scale-value subscale (possible range 0-40; higher scores indicate greater value for physical activity), ESDS-comp-Exercise Self Definition Scale-competence subscale (possible range 0-30, higher scores indicate greater competence for physical activity)

Missing data existed for baseline PA. If subjects had missing data for any of the PA questions, they were deleted for that question. Therefore, the number of subjects used for analysis of each PA variable is indicated in Table 15. The frequency (sessions/week), duration (minutes/session), and total (minutes/week) of vigorous PA were higher for non-completers than completers. The frequency, duration, and total for moderate PA were higher for completers than for non-completers. The frequency for walking was higher for the non-completers than for the completers. The mean scores for the duration of walking and the total minutes per week of walking were higher for completers than for non-completers. The mean scores for the duration of sitting were higher for completers than non-completers.

TABLE 15. *Completers vs. Non-completers: Baseline Physical Activity (N=43)*

Variable	Completers N=21					Non-completers N=22				
	N Used for Analysis	Observed Range (Median)	Mean (SD)	Skewness	Kurtosis	N Used for Analysis	Observed Range (Median)	Mean (SD)	Skewness	Kurtosis
<b>Vigorous PA</b>										
Frequency	21	0-6 (0)	.52 (1.54)	3.102	9.165	22	0-5 (0)	.55 (1.50)	2.726	6.373
Duration	21	0-60 (0)	5.71 (15.35)	2.829	7.918	21	0-120 (0)	7.14 (26.67)	4.201	18.183
Total	21	0-240 (0)	21.43 (63.74)	3.041	8.433	21	0-600 (0)	35.71 (133.36)	4.201	18.183
<b>Moderate PA</b>										
Frequency	21	0-7 (1)	1.67 (2.22)	1.404	1.315	22	0-5 (0)	.82 (1.44)	1.731	2.230
Duration	20	0-240 (5)	38.00 (61.18)	2.248	5.626	22	0-120 (0)	16.59 (36.30)	2.439	5.004
Total	20	0-1680 (5)	155.00 (373.51)	3.945	16.565	22	0-360 (0)	37.95 (85.14)	2.976	9.835
<b>Walking</b>										
Frequency	21	0-7 (3)	3.24 (2.90)	.257	-1.616	22	0-7 (6)	5.14 (2.34)	-1.068	.105
Duration	21	0-300 (20)	32.62 (69.95)	3.995	17.174	19	0-90 (30)	31.32 (24.88)	.771	-.021
Total	21	0-2100 (60)	181.19 (451.29)	4.224	18.586	19	0-450 (135)	171.84 (139.62)	.833	-.196
<b>Sitting</b>										
Duration	16	840-5880 (2520)	2677.50 (1429.44)	.850	.377	17	60-600 (240)	267.06 (163.85)	.541	-.537

*Note:* Completers-those assigned to the intervention or attention-control groups and who completed the study activities. Non-completers-those were assigned to the intervention and attention-control group but who dropped out before the end of the study and the subjects who were never assigned to either an intervention or attention-control group. SD-standard deviation, frequency-sessions/week, duration-minutes/session, total-minutes/week, PA-physical activity

### **Intervention vs. Attention-control Group**

Baseline data were analyzed for the 21 subjects who completed study activities (intervention group n=12, attention-control group n=9). A summary of their contexts of development, individual characteristics, and dependent variables follows.

**Contexts of development.** Contexts of development include socio-cultural (race, marital status, employment status, language, beliefs about the appropriateness of PA for older women) and environmental (fear of PA, access to PA) contexts. Contexts of development are shown in Table 16.

In terms of race, the majority of both groups were Caucasian (intervention n=11, attention-control n=7), which is representative of the county in which the study was conducted. One subject in the intervention group reported being Native American and two subjects in the attention-control group reported being multi-racial. All subjects in both groups (N=21) reported speaking English in the home. All subjects in both groups (N=21) believed that PA was appropriate for older women. In terms of marital status, the intervention group reported being single (n=4), married (n=2), divorced (n=3), and widowed (n=3). The attention-control group reported being single (n=2), divorced (n=4), and widowed (n=3). In terms of employment, the majority of both groups were unemployed (intervention n=8, attention-control n=8).

General fear about performing PA was divided into fear of PA itself, fear of being a victim of crime, and fear of the environment. For general fear about performing PA, the intervention group reported feeling very fearful (n=2), slightly fearful (n=4), neutral (n=2), not fearful (n=4). The attention-control group reported feeling very fearful (n=1), slightly fearful (n=1), neutral (n=2), and not fearful (n=5). For fear of PA itself, the intervention group reported

feeling slightly fearful (n=5), neutral (n=1), and not fearful (n=6). The attention-control group reported feeling very fearful (n=2), slightly fearful (n=1), neutral (n=1), and not fearful (n=5). For fear of being a victim of crime, the intervention group reported feeling slightly fearful (n=2) and not fearful (n=10). The attention-control group reported feeling very fearful (n=1), slightly fearful (n=2), neutral (n=1), and not fearful (n=5). For fear of the environment (e.g. slipping on ice), the intervention group reported feeling very fearful (n=3), slightly fearful (n=4), neutral (n=1), and not fearful (n=4). The attention-control group reported feeling very fearful (n=1), slightly fearful (n=3), neutral (n=2), and not fearful (n=3).

Access to PA was divided into how far one must travel for PA and how much trouble one has to attend a PA class. The intervention group reported traveling less than 1 mile (n=11) and between 1 and 5 miles (n=1). The attention-control group reported traveling less than 1 mile (n=8) and greater than 5 miles (n=1). For how much trouble it was to attend a PA class, the intervention group reported very much (n=1), some (n=3), and none (n=8). The attention-control group reported very much (n=3), some (n=3), and none (n=3).

TABLE 16. *Intervention vs. Attention-control: Contexts of Development (N=21)*

Variables	Intervention N=12			Attention-control N=9		
	N (%)	Skewness	Kurtosis	N (%)	Skewness	Kurtosis
Race	11 (91.7) Caucasian 1 (8.3) Native American	-	-	7 (77.8) Caucasian 2 (22.2) Multi-racial	-	-
Language Spoken in the Home	12 (100) English	-	-	9 (100) English	-	-
PA Appropriate for Older Women	12 (100) Absolutely	-	-	9 (100) Absolutely	-	-
Marital Status	4 (33) Single 2 (16.7) Married 3 (25) Divorced 3 (25) Widowed	-	-	2 (22.2) Single 0 (0) Married 4 (44.4) Divorced 3 (33.3) Widowed	-	-
Employment	0 (0) Full Time 4 (33.3) Part Time 8 (66.7) Unemployed	-	-	1 (11.1) Full Time 0 (0) Part Time 8 (88.9) Unemployed	-	-
General Fear of Performing PA	2 (16.7) Very Fearful 4 (33.3) Slightly Fearful 2 (16.7) Neutral 4 (33.3) Not Fearful	-.063	-1.473	1 (11.1) Very Fearful 1 (11.1) Slightly Fearful 2 (22.2) Neutral 5 (55.6) Not Fearful	-1.289	.770
Fear of PA Itself	5 (41.7) Slightly Fearful 0 (0) Slightly Fearful 1 (8.3) Neutral 6 (50) Not Fearful	-.192	-2.254	2 (22.2) Very Fearful 1 (11.1) Slightly Fearful 1 (1.1) Neutral 5 (55.6) Not Fearful	-.833	-1.248
Fear of Crime	0 (0) Very Fearful 2 (16.7) Slightly Fearful 0 (0) Neutral 10 (83.3) Not Fearful	-2.055	2.640	1 (11.1) Very Fearful 2 (22.2) Slightly Fearful 1 (11.1) Neutral 5 (55.6) Not Fearful	-.875	-.808

*Note:* PA-physical activity

TABLE 16. *Intervention vs. Attention-control: Contexts of Development (N=21)-continued*

Variables	Intervention N=12			Attention-control N=9		
	N (%)	Skewness	Kurtosis	N (%)	Skewness	Kurtosis
Fear of Environment	3 (25) Very Fearful	.170	-1.675	1 (11.1) Very Fearful	-.188	-1.232
	4 (33.3) Slightly Fearful			3 (33.3) Slightly Fearful		
	1 (8.3) Neutral			2 (22.2) Neutral		
	4 (33.3) Not Fearful			3 (33.3) Not Fearful		
How Far to Travel	11 (91.7) < 1 mile	3.464	12.000	8 (88.9) < 1 mile	3.000	9.000
	1 (8.3) 1-5 miles			0 (0) 1-5 miles		
	0 (0) > 5 miles			1 (11.1) > 5 miles		
How Much Trouble	1 (8.3) Very Much	-1.455	1.388	3 (33.3) Very Much	.000	-1.714
	3 (25) Some			3 (33.3) Some		
	8 (66.7) None			3 (33.3) None		

Note: PA-physical activity

**Individual characteristics.** Descriptive statistics for individual characteristics are shown in Table 17. The intervention group's ages ranged from 53 to 91 (mean 68.17, SD=12.95), while the attention-control group's ages ranged from 53 to 99 (mean 69.22, SD=14.07). For health status, all of the intervention group subjects (n=12) reported their health was good. In the attention-control group, subjects reported their health as excellent (n=1), good (n=4), and fair (n=4). For SES, the majority of subjects in both groups reported having either enough (intervention n=8; attention-control n=8) or more than enough (intervention n=2; attention-control n=1). Only two subjects (both in the intervention group) reported having less than enough. The majority of subjects (intervention group n=9; attention-control group n=9) had prior PA histories. Three subjects in the intervention group did not have prior PA histories.

The mean Self-esteem Scale scores (possible range 5 to 50) were 37.75 (SD=5.78) in the intervention group and 37.22 (SD=6.72) in the attention-control group. The mean Ego-resiliency Scale scores (possible range 14 to 56) were 44.00 (SD=7.66) in the intervention group and 42.11 (SD=8.89) in the attention-control group. Mean scores for the Psychological Self-monitoring Scale (possible range 0 to 18) were 6.00 (SD=4.24) in the intervention group and 7.00 (SD=2.83) in the attention-control group.

TABLE 17. *Intervention vs. Attention-control: Individual Characteristics (N=21)*

Variable	Intervention N=12				Attention-control N=9		
	N (%)	Skewness	Kurtosis	N (%)	Skewness	Kurtosis	
Health Status	0 (0) Excellent 12 (100) Good 0 (0) Fair	-	-	1 (11.1) Excellent 4 (44.4) Good 4 (44.4) Fair	-.606	-.286	
SES	2 (16.7) > Enough 8 (66.7) Enough 2 (16.7) < Enough	.000	.733	1 (11.1) > Enough 8 (88.9) Enough 0 (0) < Enough	-3.000	9.000	
Prior PA History	9 (75) Yes 3 (25) No	-	-	9 (100) Yes 0 (0) No	-	-	

Note: SES-socio-economic status, PA-physical activity

	Observed Range	Mean (SD)	Median	Skewness	Kurtosis	Observed Range	Mean (SD)	Median	Skewness	Kurtosis
Age	53-91	68.17 (12.95)	67	.499	-.920	53-99	69.22 (14.07)	63	1.374	1.682
Self-esteem	25-49	37.75 (5.78)	38	-.338	3.024	26-46	37.22 (6.72)	40	-.447	-1.051
Ego-resiliency	34-55	44.00 (7.66)	43	.176	-1.267	30-55	42.11 (8.89)	39	.255	-1.484
Self-monitoring	0-13	6.00 (4.24)	5	.446	-.996	3-12	7.00 (2.83)	7	.298	-.336

Note: SD-standard deviation; Self-esteem Scale possible range 5-50, higher scores indicate higher self-esteem; Ego-resiliency Scale possible range 14-56, higher scores indicate higher ego-resiliency; Self-monitoring Scale possible range 0-18, higher scores indicate higher psychological self-monitoring.

**Dependent variables.** Descriptive statistics on dependent variables (EIS, ESDS, and IPAQ) are presented in Tables 18 and 19. The first physically active identity measure, the EIS, has a possible range of 9 to 45. Higher scores indicate higher physically active identities. The intervention group had a mean of 31.17 (SD=4.47). The attention-control group had a mean of 23.33 (SD=9.25). The second physically active identity measure is the ESDS total scale. Possible scores range from 0 to 110. Higher scores indicate higher physically active identities. The intervention group had a mean score of 62.25 (SD=23.11). The attention-control group had a mean score of 53.22 (SD=20.49).

The first ESDS subscale, acknowledgement, has a possible range of 0 to 40. Higher scores indicate greater association with the term “exerciser.” The intervention group had a mean score of 16.83 (SD=11.31). The attention-control group had a mean score of 13.11 (SD=10.25). The second ESDS subscale, value, has a possible range of 0 to 40. Higher scores indicate greater value for PA. The intervention group had a mean score of 28.67 (SD=7.54). The attention-control group had a mean score of 23.33 (SD=8.57). The third ESDS subscale, competence, has a possible range of 0 to 30. Higher scores indicate greater competence for PA. The intervention group had a mean score of 16.75 (SD=6.66). The attention-control group had a mean score of 16.78 (SD=6.46).

TABLE 18. *Intervention vs. Attention-control: Baseline Physically Active Identities (N=21)*

Variable	Intervention N=12					Attention-control N=9				
	N Used for Analysis	Observed Range (Median)	Mean (SD)	Skewness	Kurtosis	N Used for Analysis	Observed Range (Median)	Mean (SD)	Skewness	Kurtosis
EIS	12	23-37 (33.5)	31.17 (4.47)	-.499	-1.170	9	14-45 (20)	23.33 (9.25)	1.762	3.984
ESDS total	12	29-100 (61)	62.25 (23.11)	.085	-1.002	9	27-99 (50)	53.22 (20.49)	1.397	2.927
ESDS- acknow	12	0-34 (15.5)	16.83 (11.31)	.110	-1.420	9	0-35 (14)	13.11 (10.25)	.965	2.246
ESDS- value	12	19-38 (32)	28.67 (7.54)	-.275	-2.002	9	14-40 (21)	23.33 (8.57)	.968	.467
ESDS- comp	12	6-30 (17.5)	16.75 (6.66)	.227	.052	9	5-24 (20)	16.78 (6.46)	-.807	-.553

*Note:* SD-standard deviation, EIS-Exercise Identity Scale (possible range 9-45; higher scores indicate higher physically active identities), ESDS total-Exercise Self Definition Scale (total scale, possible range 0-110; higher scores indicate higher physically active identities), ESDS-acknow-Exercise Self Definition Scale-acknowledgement subscale (possible range 0-40, higher scores indicate greater association with the term “exerciser”), ESDS-value-Exercise Self Definition Scale-value subscale (possible range 0-40; higher scores indicate greater value for physical activity), ESDS-comp-Exercise Self Definition Scale-competence subscale (possible range 0-30, higher scores indicate greater competence for physical activity)

Missing data existed for baseline PA. If subjects had missing data for any of the PA questions, they were deleted for that question. Therefore, the number of subjects used for analysis of each PA variable is indicated in Table 19. At baseline, the intervention group reported 37.5 (SD=82.03) minutes per week of vigorous PA, compared with 0 minutes per week for the attention-control group. The intervention group reported a total of 230 (SD=495.46) minutes per week of moderate PA, compared with 63.33 (SD= 85.44) minutes per week for the attention-control group. The intervention group reported 286.67 (SD=583.41) minutes of walking per week, compared to 40.56 (SD=46.93) minutes per week for the attention-control group. The intervention group reported sitting for an average of 2152.50 (652.11) minutes per day compared with the attention-control group who reported sitting for 3202.50 (SD=1822.98) minutes per day.

TABLE 19. *Intervention vs. Attention-control: Baseline Physical Activity (N=21)*

Variable	Intervention N=12					Attention-control N=9				
	N Used for Analysis	Observed Range (Median)	Mean (SD)	Skewness	Kurtosis	N Used for Analysis	Observed Range (Median)	Mean (SD)	Skewness	Kurtosis
<b>Vigorous PA</b>										
Frequency	12	0-6 (0)	0.92 (1.98)	2.176	3.880	9	- (0)	0	-	-
Duration	12	0-60 (0)	10 (19.54)	1.930	3.165	9	- (0)	0	-	-
Total	12	0-240 (0)	37.5 (82.03)	2.119	3.314	9	- (0)	0	-	-
<b>Moderate PA</b>										
Frequency	12	0-7 (1)	2.08 (2.61)	1.180	.274	9	0-4 (0)	1.11 (1.54)	1.094	-.217
Duration	11	0-240 (10)	44.55 (74.61)	2.180	4.783	9	0-120 (0)	30.00 (42.43)	1.364	1.321
Total	11	0-1680 (10)	230 (495.46)	2.991	9.334	9	0-240 (0)	63.33 (85.44)	1.192	.836
<b>Walking</b>										
Frequency	12	0-7 (3)	3.83 (2.89)	-.155	-1.596	9	0-7	2.44 (2.88)	.964	-.728
Duration	12	0-300 (25)	47.50 (82.03)	3.103	10.171	9	0-40 (10)	12.78 (13.94)	1.124	.510
Total	12	0-2100 (115)	286.67 (583.41)	3.218	10.711	9	0-120 (20)	40.56 (46.93)	.866	-.873
<b>Sitting</b>										
Duration	8	840-2940 (2310)	2152.50 (652.11)	-1.188	1.654	8	840-5880 (3360)	3202.50 (1822.98)	.074	-1.344

*Note:* SD-standard deviation, PA-physical activity, frequency-sessions/week, duration-minutes/session, total-minutes/week

### **Significance Testing of Baseline Data**

Baseline data were analyzed to determine if significant differences existed between completers versus non-completers and between the intervention versus attention-control groups. However, before the results of significance testing are presented, a brief discussion of power is necessary. Power was set at .80 based on Cohen's (1987) recommendations. The effect size for this study was large (.80), based on prior cognitive-behavioral intervention studies (Pinquart, Duberstein, & Lyness, 2007). According to Cohen's table, with significance set at  $p < .05$ , the required sample size was 52 to test for differences between groups. However, the total sample ( $N=43$ ) fell below that required based on the power analysis. Therefore, results of significance testing are at risk of type II errors.

Significance testing was performed using t-tests for continuous variables and Chi square analysis for categorical variables. Significance was set at  $p < .05$ . Language and appropriateness of PA for older women were dropped from analysis as all subjects ( $N=43$ ) had identical responses for these two variables.

### Completers vs. Non-completers

As shown in Table 20, no significant differences were found for categorical variables between completers versus non-completers according to chi-square analysis.

TABLE 20. *Chi-square Analysis: Completers vs. Non-completers at Baseline (N=43)*

Variable	Pearson's Chi Square	df	N Used in Analysis	Sig.*
Marital Status	2.45	3	43	.483
Employment	.237	2	43	.888
Race	2.417	3	43	.491
Health Status	2.368	2	43	.306
History of Prior PA	1.208	1	43	.272
General Fear About Performing PA	.263	3	43	.967
Fear of PA Itself	.744	3	43	.863
Fear of Crime	2.264	3	43	.520
Fear of Environment	1.944	3	43	.584
How Far to Travel	4.808	2	43	.090
How Much Trouble to Attend PA Class	3.297	2	43	.192

\*Significance  $p < .05$ .  
*Note:* PA-physical activity

As shown in Table 21, two continuous variables were significantly different at baseline according to t-tests. Walking frequency resulted in  $p=.023$  and sitting duration resulted in  $p=.000$ . Results were that walking frequency and sitting duration at baseline predicted who chose to complete the study versus who did not.

TABLE 21. *t*-tests: Completers vs. Non-completers at Baseline (N=43)

Variable	t	df	N Used in Analysis	Sig.* (2-tailed)
Age	1.035	41	43	.307
Socio-economic Status	-.566	41	43	.574
Self-esteem	-.968	41	43	.339
Psychological Self-Monitoring	.588	41	43	.560
Ego-resiliency	-.270	41	43	.788
EIS	-1.234	41	43	.224
ESDS total	-1.296	40	42	.202
ESDS-acknowledgement subscale	-1.054	40	42	.298
ESDS- value subscale	-1.987	40	42	.054
ESDS- competence subscale	-.333	40	42	.741
Vigorous PA Frequency	-.047	41	43	.963
Vigorous PA Duration	-.213	40	42	.833
Vigorous PA Total	-.443	40	42	.660
Moderate PA Frequency	1.495	41	43	.143
Moderate PA Duration	1.394	40	42	.171
Moderate PA Total	1.431	40	42	.160
Walking Frequency	-2.371	41	43	.023*
Walking Duration	.083	38	40	.934
Walking Total	.087	38	40	.931
Sitting Duration	6.911	31	33	.000*

\*Significance  $p < .05$ ; 2-group, independent sample.

Note: PA-physical activity, EIS-Exercise Identity Scale, ESDS-Exercise Self Definition Scale

### Intervention vs. Attention-control Group

As shown in Table 22, no significant differences were found in categorical variables between the intervention and attention-control groups at baseline according to chi-square analysis.

TABLE 22. *Chi-square Analysis: Intervention vs. Attention-control at Baseline (N=21)*

Variable	Pearson's Chi Square	df	N Used in Analysis	Sig.*
Marital Status	2.431	3	21	.488
Employment	4.667	2	21	.097
Race	3.532	2	21	.171
History of Prior PA	2.625	1	21	.105
General Fear About Performing PA	1.854	3	21	.603
Fear of PA Itself	4.419	3	21	.220
Fear of Crime	3.306	3	21	.347
Fear of Environment	1.215	3	21	.749
How Far to Travel	2.088	2	21	.352
How Much Trouble to Attend PA Class	2.903	2	21	.234

\*Significance  $p < .05$ .  
*Note:* PA-physical activity

However, as shown in Table 23, significant differences were found between the intervention and attention-control groups in baseline EIS scores ( $p=.019$ ). Thus, baseline EIS will be used as a covariate during hypothesis testing.

TABLE 23. *t*-tests: Intervention vs. Attention-control at Baseline (N=21)

Variable	t	df	N Used in Analysis	Sig.* (2-tailed)
Age	-.178	19	21	.860
Health Status	-1.414	19	21	.195
Socio-economic Status	.497	19	21	.625
Self-esteem	.197	19	21	.846
Psychological Self-Monitoring	-.611	19	21	.549
Ego-resiliency	.677	19	21	.506
EIS	2.576	19	21	.019*
ESDS total	.929	19	21	.365
ESDS-acknowledgement subscale	.776	19	21	.447
ESDS- value subscale	1.514	19	21	.147
ESDS- competence subscale	-.010	19	21	.992
Vigorous PA Frequency	1.383	19	21	.183
Vigorous PA Duration	1.525	19	21	.144
Vigorous PA Total	1.362	19	21	.189
Moderate PA Frequency	.992	19	21	.334
Moderate PA Duration	.519	18	20	.610
Moderate PA Total	.992	18	20	.334
Walking Frequency	1.093	19	21	.288
Walking Duration	1.248	19	21	.227
Walking Total	1.254	19	21	.225
Sitting Duration	-1.534	8.763	16	.160

\*Significance  $p < .05$ ; 2-group, independent sample.

Note: PA-physical activity, EIS-Exercise Identity Scale, ESDS-Exercise Self Definition Scale

### Physical Activity Data

Physical activity data collected during the intervention and attention-control activities were from those subjects (N=21) who were either in the intervention (n=12) or attention-control (n=9) groups. Subjects were instructed to record the type (purpose), frequency, and duration of PA they did on a daily basis on the PA Tracking Sheets. Subjects were also asked to wear pedometers and to record their daily step counts on the PA Tracking Sheets. Yet, compliance

with documentation of PA and pedometer step counts varied widely. A breakdown of compliance with completion of PA Tracking Sheets is presented in Table 24.

	Intervention N=12	Attention-control N=9
	N (%) Compliance	N (%) Compliance
PA Purpose	10 (83.33)	7 (77.77)
PA Duration	4 (33.33)	6 (66.67)
Pedometer Step Counts	11 (91.67)	7 (77.77)

*Note:* PA-physical activity

Missing PA data existed. To handle missing data, subjects were dropped from analysis for the week if they recorded less than 3 entries for the week. Most subjects in both groups provided data on purposive PA (intervention group n=10, attention-control group n=7) and the pedometer step-counts (intervention group n=11, attention-control group n=7). However, subjects in both groups were less compliant in providing data on PA duration (intervention group n=4, attention-control group n=6). Thus, no analyses were run on PA duration due to lack of sufficient data. Also, because no differentiation could be made between missing data and no activity, frequency of PA based on the PA Tracking Sheets could not be assessed.

### **Purposive Physical Activity**

The data that were available on the PA Tracking Sheets were analyzed by purposive type of PA. Only two subjects (both in the intervention group) logged any occupational PA, so occupational PA was dropped from analyses. Also, no differentiation could be made between PA performed for transportation purposes versus leisure-time purposes (e.g. walking, bike riding). Therefore, transportation PA was also dropped from analyses and all activities not counted as household PA were counted as leisure-time PA.

A summary of subjects' household PA by week is shown in Table 25. Household PA included house cleaning, cooking, laundry, and yard work (including gardening). In general, there was a decrease in household PA by the intervention group and an increase in household PA by the attention-control group over the nine-week study period.

TABLE 25. *Percent of Intervention and Attention-control Subjects Who Performed Household Physical Activity by Week (N=21)*

Week	Intervention N=12		Attention-control N=9	
	N Documenting PA for the Week	N (%) Who Performed Household PA	N Documenting PA for the Week	N (%) Who Performed Household PA
1	10	7 (70.0)	7	4 (57.1)
2	9	5 (55.6)	7	4 (57.1)
3	8	3 (37.5)	7	5 (71.4)
4	9	3 (33.3)	7	5 (71.4)
5	7	2 (28.6)	7	5 (71.4)
6	6	2 (33.3)	7	5 (71.4)
7	6	2 (33.3)	7	5 (71.4)
8	7	3 (42.9)	7	5 (71.4)

*Note:* PA-physical activity

A summary of subjects' leisure-time PA is shown in Table 26. Leisure-time PA included walking, stair climbing, bike riding, chair exercises, swimming, yoga, dancing, weight-lifting, and stretching. There was a general increase in both the intervention and attention-control groups in leisure-time PA over the nine-week study period.

TABLE 26. *Percent of Intervention and Attention-control Subjects Who Performed Leisure-Time Physical Activity by Week (N=21)*

Week	Intervention N=12		Attention-control N=9	
	N Documenting PA for the Week	N (%) Who Performed Leisure-time PA	N Documenting PA for the Week	N (%) Who Performed Leisure-time PA
1	9	5 (55.6)	7	6 (85.7)
2	9	7 (77.8)	7	5 (71.4)
3	8	6 (75.0)	7	5 (71.4)
4	9	6 (66.7)	7	6 (85.7)
5	7	7 (100)	7	5 (71.4)
6	6	6 (100)	7	5 (71.4)
7	6	6 (100)	7	6 (85.7)
8	7	6 (85.7)	7	6 (100)

*Note:* PA-physical activity

**Pedometer step counts.** Results of the pedometer step counts are shown in Table 27. The intervention group subjects recorded higher step counts compared to the attention-control group for the duration of the study period. The intervention group's median step counts ranged from 2593 steps during week 2 to 4707 steps during week 6. The attention-control group's median step counts ranged from 519.5 steps during week 3 to 2029 during week 8.

TABLE 27. *Intervention and Attention-control Subjects' Average Pedometer Steps Per Day by Week (N=21)*

Week	Intervention N=12				Attention-control N=9			
	N of Subjects Documenting Step Counts	Observed Range	Mean (SD)	Median	N of Subjects Documenting Step Counts	Observed Range	Mean (SD)	Median
1	8	650-6421	3763.38 (1819.02)	3804.5	7	61-3763	1237.14 (594.06)	764
2	10	531-4620	2563 (1337.69)	2593	7	76-4796	1203.71 (1637.08)	686
3	11	640-7353	3563.18 (2183.22)	4356	6	152-3005	870.17 (1066.85)	519.5
4	11	430-6730	3355.91 (2068.49)	3428	7	158-3520	1103.57 (1127.00)	734
5	9	573-7651	4068.44 (2313.49)	4619	7	128-3780	1303.71 (1281.31)	1082
6	10	521-8280	4045.70 (2509.30)	4707	7	98-6924	1731.14 (2385.84)	761
7	10	406-5713	2968.10 (1736.58)	2857	7	132-4445	1655.29 (1644.89)	881
8	9	489-7975	3793.56 (2387.08)	4160	6	235-7975	2774.47 (2293.70)	2029

*Note:* SD-standard deviation

## **Week 9 Measures**

### **Subjects' Study Evaluation**

During week 9, the Study Evaluation form was administered to give the subjects an opportunity to evaluate the study. The Study Evaluation forms allowed subjects to evaluate weekly study activities, sites where the activities were held and group facilitators. Subjects in both the intervention group (n=12) and the attention-control group did not identify a single session they liked best nor did they identify any sessions that were not needed.

### **Comparison of Dependent Variables: Baseline vs. Week 9**

Data from the EIS, ESDS, and IPAQ data were analyzed for the subjects who completed study activities (intervention n=12, attention-control n=9). A comparison of physically active identity scores for the intervention group (n=12) and the attention-control group (n=9) at baseline and week 9 is presented in Table 28. Both groups increased their physically active identity scores (EIS, ESDS total, and ESDS subscales) over the nine-week study period.

A comparison of IPAQ data at baseline and week 9 are presented in Table 29. The intervention group and the attention-control group differed in their vigorous PA, moderate PA, walking, and sitting at baseline and at week 9. Both groups increased their vigorous PA (frequency, duration), moderate PA (frequency, duration), and walking (frequency, duration). Both groups decreased their duration of sitting.

TABLE 28. Comparison of Intervention and Attention-control Physically Active Identity Scores: Baseline to Week 9 (N=21)

Measure	Intervention N=12						Attention-control N=9					
	Baseline			Week 9			Baseline			Week 9		
	Observed Range	Mean (SD)	Median	Observed Range	Mean (SD)	Median	Observed Range	Mean (SD)	Median	Observed Range	Mean (SD)	Median
EIS	23-37	31.17 (4.67)	33.5	13-43	35.00 (8.18)	37	14-45	23.33 (9.25)	20	21-45	29.56 (8.75)	28
ESDS total	29-100	62.25 (23.11)	61	26-108	75.08 (21.98)	73	27-99	53.22 (20.49)	50	32-106	58.33 (29.10)	47
ESDS-acknow	0-34	16.83 (11.31)	15.5	0-39	22.50 (11.73)	23	0-35	13.11 (10.25)	14	4-40	18.33 (13.07)	15
ESDS-value	19-38	28.67 (7.54)	32	22-40	32.92 (5.58)	34	14-40	23.33 (8.57)	21	8-40	22.89 (10.92)	20
ESDS-comp	6-30	16.75 (6.66)	17.5	4-29	19.67 (7.81)	19	5-24	16.78 (6.46)	20	2-30	17.33 (8.43)	17

Note: SD-standard deviation, EIS-Exercise Identity Scale (possible range 9-45, higher scores indicate higher physically active identities), ES DS total-Exercise Self Definition Scale (total scale, possible range 0-110, higher scores indicate higher physically active identities), ES DS-acknow-Exercise Self Definition Scale-acknowledgement subscale (possible range 0-40, higher scores indicate greater association with the term “exerciser”), ES DS-value-Exercise Self Definition Scale-value subscale (possible range 0-40, higher scores indicate greater value for physical activity), ES DS-comp-Exercise Self Definition Scale-competence subscale (possible range 0-30, higher scores indicate greater competence for physical activity)

TABLE 29. Comparison of International Physical Activity Questionnaire Data: Baseline to Week 9

Variable	Intervention Group N=12						Attention-control Group N=9					
	Baseline			Week 9			Baseline			Week 9		
	Observed Range	Mean (SD)	N (Median)	Observed Range	Mean (SD)	N (Median)	Observed Range	Mean (SD)	N (Median)	Observed Range	Mean (SD)	N (Median)
<b>Vigorous PA</b>												
Frequency	0-6	0.92 (1.98)	12 (0)	0-6	2.00 (2.21)	10 (1.5)	0	0	9 (0)	0-2	0.33 (0.71)	9 (0)
Duration	0-60	10 (19.54)	12 (0)	0-180	40.71 (66.36)	7 (0)	0	0	9 (0)	0-60	7.50 (21.21)	8 (0)
Total	0-240	37.5 (82.03)	12 (0)	0-1080	222.50 (424.73)	6 (60)	0	0	9 (0)	0-120	15 (42.43)	8 (0)
<b>Moderate PA</b>												
Frequency	0-7	2.08 (2.61)	12 (1)	0-7	3.10 (2.02)	10 (3)	0-4	1.11 (1.54)	9 (0)	0-7	3.11 (3.06)	9 (2)
Duration	0-240	44.55 (74.61)	11 (10)	0-240	61.67 (89.76)	6 (30)	0-120	30.00 (42.43)	9 (0)	0-120	35.63 (41.70)	8 (17.5)
Total	0-1680	230 (495.46)	11 (10)	0-240	123.33 (91.36)	6 (120)	0-240	63.33 (85.44)	9 (0)	0-840	196.88 (296.61)	8 (62.5)
<b>Walking</b>												
Frequency	0-7	3.83 (2.89)	12 (3)	0-7	5.25 (2.22)	12 (6)	0-7	2.44 (2.88)	9 (1)	0-7	2.89 (3.22)	9 (1)
Duration	0-300	47.50 (82.03)	12 (25)	0-780	219.55 (241.71)	11 (180)	0-40	12.78 (13.94)	9 (10)	0-120	31.88 (41.23)	8 (22.5)
Total	0-2100	286.67 (583.41)	12 (115)	0-5460	1465.91 (1700.98)	11 (1260)	0-120	40.56 (46.93)	9 (20)	0-84	196.88 (298.65)	8 (52.5)
<b>Sitting</b>												
Duration	840-2940	2152.50 (652.11)	8 (2310)	60-420	232.50 (130.02)	8 (240)	840-5880	3202.50 (1822.98)	8 (3360)	120-1080	420.00 (332.26)	7 (360)

Note: Frequency-sessions/week, Duration-minutes/session, Total-minutes/week, SD-standard deviation, PA-physical activity

### Hypothesis Testing

Hypothesis testing was performed on data from the EIS, ESDS, IPAQ, PA Tracking Sheets, and pedometer step counts for the subjects who completed study activities (intervention n=12, attention-control n=9). The study was underpowered to detect significant differences between groups. While hypothesis testing was performed, the low power to detect differences between groups is a threat to statistical conclusion validity.

**Hypothesis 1: There will be a significantly greater change in the association with physically active identities at the end of the nine-week study period in the intervention group compared to the attention-control group**

This hypothesis was supported if the intervention group had a significantly greater change over time in their physically active identities compared with the attention-control group (as indicated by a significant interaction) on *both* the EIS and ESDS (total and subscale) scores. This hypothesis was partially supported if the significant intervention effect was for *either* the EIS or ESDS scores. The first factor is group (intervention versus attention-control) and the second factor is time (baseline versus week 9).

To test Hypothesis 1, a mixed design 2x2 ANOVA was used with EIS scores. A mixed design 2x2 ANCOVA was used with the ESDS total and ESDS subscale scores, with baseline mean EIS scores used as a covariate. Results are presented in Table 30. No significant differences were found between the intervention and attention-control groups in their change in physically active identity scores over the nine-week study period. Therefore, Hypothesis 1 was not supported.

TABLE 30. *Hypothesis 1 Testing: Change in Physically Active Identities Between Intervention (N=12) and Attention-control (N=9) Groups*

Scale	F	df	Sig.*
EIS	.611	1, 19	.444
ESDS total	1.411	1, 18	.250
ESDS- acknowledgement	.464	1, 18	.504
ESDS-value	1.690	1, 18	.210
ESDS-competence	.752	1, 18	.397

\*Significance  $p < .05$ . Separate analyses focused on interaction effects using a mixed design 2x2 ANOVA for EIS scores and a mixed design 2x2 ANCOVA for ESDS scores, using baseline EIS as a covariate.

Note: EIS-Exercise Identity Scale, ESDS-Exercise Self Definition Scale

**Hypothesis 2: There will be a significantly greater increase in PA at the end of the nine-week study period in the intervention group compared to the attention-control group.**

This hypothesis was supported if there were significant intervention effects (i.e. a significant interaction) on all three PA data sources (PA Tracking Sheet, pedometer step counts, and the IPAQ measures). This hypothesis was partially supported if the intervention effect was significant in at least *one* of the PA measures. The first factor is group (intervention versus attention-control) and the second factor is time (baseline versus week 9).

To test this hypothesis, a mixed design 2x2 ANCOVA was used with the baseline EIS scores used as a covariate. As shown in Table 31, results of hypothesis testing showed no significant difference in the changes over time between the intervention and attention-control groups in any of the PA measures. Thus, Hypothesis II was not supported.

TABLE 31. *Hypothesis 2 Testing: Change in Physical Activity Between Intervention (N=12) and Attention-control (N=9) Groups*

Measure	F	df	Sig.*
Vigorous PA Frequency	1.479	1, 16	.242
Vigorous PA Duration	.267	1, 12	.615
Vigorous PA Total	1.912	1, 11	.194
Moderate PA Frequency	.179	1, 16	.678
Moderate PA Duration	.418	1, 10	.532
Moderate PA Total	1.375	1, 10	.268
Walking Frequency	.009	1, 18	.927
Walking Duration	1.996	1, 16	.177
Walking Total	1.820	1, 16	.196
Sitting Duration	.000	1, 8	.998
Household PA	2.756	1, 9	.131
Leisure-time PA	.009	1, 8	.925
Pedometer Step Counts	.901	1, 6	.379

\*Significance  $p < .05$  based on a mixed design 2x2 ANCOVA, with baseline EIS used as a covariate.

Note: PA-physical activity

### Secondary Aims Testing

Secondary aims were to identify the contexts of development and individual characteristics of physically inactive older women that contribute to the development of physically active identities. Contexts of development and individual characteristics have been identified in prior research as influencing older women's physically active identities (Hardcastle & Taylor, 2005; Medina, 1996; Whaley, 2003). Correlation matrix analyses were used with continuous data reflecting contexts of development, individual characteristics, and physically active identity measures to see if significant correlations existed. Data from the 21 subjects who completed the study were used for this analysis. Nominal variables (race, employment, marital status, language) were excluded from analysis. Beliefs about the appropriateness of PA for older women were also excluded since scores had zero variance. Results are presented in Table 32. Significant correlations were found between baseline EIS and health status ( $r = -.394, p = .039$ ),

ego-resiliency ( $r=.389, p=.040$ ), and fear in general ( $r=-.436, p=.024$ ). Significant correlations were found between baseline ESDS total scale scores and ego-resiliency ( $r=.470, p=.016$ ) and between ESDS total scale scores at week 9 and how much trouble to access PA ( $r=.463, p=.017$ ).

### **Conclusion**

In this chapter, the results of the study were presented. The subject recruitment, assignment, and retention strategies were explained. Descriptive analyses were provided on completers versus non-completers and intervention versus attention-control group subjects. Significance testing was performed to compare differences between groups. The study hypotheses and secondary aims were presented. Due to low power, there is a high risk for type II error.

TABLE 32. Correlation Matrix of Contexts of Development and Individual Characteristics with Physically Active Identity Measures of those who Completed the Study (N=21)

	EIS1	EIS2	ESDS1	ESDS2	Healthst	Selfmon	ego	selfest	age	Fear gen	fearpa	crime	envir	travel	trouble
EIS1	1.000														
EIS2	.657	1.000													
ESDS1	.682	.663	1.000												
ESDS2	.543	.899	.705	1.000											
Healthst	-	-	-.296	-.136	1.000										
selfmon	.394*	.229				1.000									
ego	.054	-.086	-.265	.192			1.000								
selfest	.389*	.200	.470*	.219	-.549	.256		1.000							
age	.303	.186	.344	.309	-.398	.058	.592		1.000						
feargen	-.093	.060	-.009	.043	-.214	-.507	-	-	1.000						
fearpa							.366	.024		1.000					
crime							.228	.326	.095		1.000				
envir												1.000			
travel													1.000		
trouble														1.000	

\*Pearson's correlations significant  $p < .05$ .

Note: EIS1-Baseline Exercise Identity Scale, EIS2-Week 9 Exercise Identity Scale, ESDS1-Baseline Exercise Self Definition Scale, ESDS2-Week 9 Exercise Self Definition Scale, Health's-health status, salmon-Psychological Self-monitoring Scale, ego-Ego-resiliency Scale, Safest-Self-esteem Scale, feared-fear of physical activity in general, fear-fear of physical activity itself, crime-fear of crime, envir-fear of environment, travel-how far to travel to access physical activity, trouble-how much trouble to attend a physical activity class

## **CHAPTER FIVE: DISCUSSION**

In this chapter, the study findings presented in Chapter 4 are discussed. The study's implications for nursing education, research, and practice are explored. This study's purpose was to test whether physically active identity development could be facilitated in a sample of physically inactive older women, and if a facilitated physically active identity was associated with increased PA. The Physically Active Identity Development Conceptual Model was developed from prior research on identity formation (Grievant, 1987; Markus & Nurius, 1986; Medina, 1996), behavior change (Bandura, 1999a, 1999b; Kearney & O'Sullivan, 2003), wellness motivation (Fleury, 1991), and constructivist theory (Kelly, 1955, 1963).

### **Recruitment, Assignment, and Attrition**

Recruitment for this study was difficult. Of the strategies that the PI pursued, the most effective was referrals from staff working at senior housing and senior centers. This underscores the importance of having community contacts or "gate keepers" prior to conducting intervention study recruitment. Recruitment might have been particularly difficult for this study for several reasons. First, the study was conducted in a relatively small urban community with a limited number of senior housing facilities and senior centers. Second, the PI was relatively new to the community and had to create relationships with community partners in order to identify study sites. Third, the PI was not associated with any local or familiar institutions. Finally, there were at least two other interventions taking place in the community that were recruiting individuals of the same demographic background.

Subject assignment was also difficult. Problems with subject assignment included having less than 10 individuals enrolled at a study site, subjects at a site having conflicting schedules,

and having limited availability of the multipurpose rooms where activities were held. These difficulties underscore the importance of utilizing other methods of subject participation like asynchronous participation and remote participation (e.g. telemedicine).

Subject attrition was a problem, as less than half of the subjects who were enrolled in the study completed study activities. Subject attrition resulted from several factors. First, subjects who were among the first to enroll at a particular study site had to wait up to several months for study activities to begin. Some subjects changed their minds about participating or had changes in their health status during this time period. Second, subjects who did participate in study activities experienced changes in their health and had to drop out of the study. Third, subjects had to drop out of the study due to caregiving responsibilities. Fourth, subjects dropped out due to lack of transportation. Recommendations for future studies include partnering with primary care offices, caregiving agencies, telemedicine, and transportation services so these barriers to participation are lessened.

### **Influences on Physically Active Identity Development**

Prior research suggests that contexts of development and individual characteristics influence physically active identity development in older women (Hardcastle & Taylor, 2005; Medina, 1996). Results from this study found several significant associations between variables reflecting contexts of development and individual characteristics and physically active identities.

Health status was negatively associated with physically active identity scores. Prior research suggests that health status can influence physically active identities positively and negatively. For example, according to Frazier and Hooker (2006), health becomes increasingly important to individuals' self conceptions as they age. When older adults have health-related

hoped-for possible selves that they feel capable of achieving, they are more likely to engage in health promoting behaviors like PA. Conversely, if individuals have health-related hoped-for possible selves that they do not feel capable of achieving, they are less likely to pursue health promoting behaviors like PA. Medina (1996) found that worsening health was what prompted individuals to undertake the identity development process. For example, critical experiences like being diagnosed with hypertension or having a heart attack resulted in individuals making a mental commitment to change and to begin the physically active identity development process. Future studies might consider focusing on the presence of health-related possible selves for older women and the direction of the influence of health-related possible selves on their physically active identity development.

Results from this study also found that ego-resiliency was positively associated with older women's physically active identities. Ego-resiliency is important because it reflects the extent to which older women believe they can change their behavior (Block & Block, 1980). This study's findings are consistent with those of Medina (1996). She found that physically active identities were able to develop in individuals who made a mental commitment to change following major life transitions (e.g. breakup of a marriage). These major life transitions caused individuals to appraise who they were and whether or not they were satisfied with the direction their life was taking. However, others believed they were not able to change and this belief prevented them from committing to PA. Future studies would benefit from exploring whether or not ego-resiliency can be improved in older women, and if so, the extent of the influence ego-resiliency has on older women's physically active identity development and PA.

Results from this study suggest that general fear of performing PA was negatively associated with older women's physically active identities. This is consistent with prior research that suggested general fear of PA is a barrier for older women's PA (Medina, 1996). Medina found that heavy traffic, stray dogs, bad weather, and seasonal darkness were among the general fears of those pursuing PA. Future studies should develop strategies to reduce older women's fears about PA so that the development of physically active identities is more likely.

Finally, results from this study found a positive association between older women's access to PA and physically active identities. This is consistent with prior research as Wilcox et al. (2005) found that lack of facilities was a barrier to PA for older women. Future studies should identify ways to increase older women's access to PA so that older women are more likely to develop physically active identities and be physically active.

### **Physically Active Identities**

Physically active identities were measured with the EIS and the ESDS. Ceiling effects were noted for some subjects on all of the physically active identity measures. No significant differences were found between completers and non-completers on either of the physically active identity scales at baseline. Intervention group subjects had significantly higher physically active identities at baseline compared with the attention-control group based on one of the physically active identity scales (EIS).

Subjects in both the intervention and attention-control groups increased their associations with physically active identities over the nine-week study period based on both the EIS and ESDS. However, this change was not significantly different between the two groups. Due to the study's low statistical power, it is possible that the intervention was effective although the results

of this study do not support this. Future studies where the sample sizes are large enough to have sufficient power to detect differences between groups are needed to determine the efficacy of this intervention on facilitating physically active identity development.

### **Physical Activity**

At baseline, no significant differences were found between completers and non-completers in vigorous PA, moderate PA, or walking duration. Significant differences were noted with walking frequency and sitting duration between completers versus non-completers. Non-completers had significantly greater walking frequencies and significantly lower sitting duration compared with completers. Although the reasons for this are not clear, it is possible that those who did not complete the study may have walked more and sat less because they had more competing commitments (e.g. caregiving responsibilities) than those who did complete the study. If so, this underscores the importance of providing supportive services for older women who want to participate in intervention studies so that their completion of study activities is more likely. Future studies might consider the influences of walking frequency and sitting duration on subjects' decision to complete PA intervention studies.

No significant differences in vigorous PA, moderate PA, walking, or sitting were noted at baseline between the intervention and attention-control groups. There were no significant differences between the intervention and attention-control groups in the changes in any of the PA measures. Again, this may reflect type II error due to the study's low power. Future studies with larger samples need to re-test the intervention to determine the efficacy of the intervention on increasing older women's PA.

The increase in vigorous PA in subjects in both the intervention and attention-control groups requires some discussion. All subjects were instructed to perform PA of low to moderate intensity in order to reduce their risk of injury resulting from PA. Yet, subjects in both the intervention and attention-control groups reported increases in vigorous PA over the nine-week study period. There could have been two reasons for this increase. First, subjects could have over-estimated the intensity of the activities they did. That is, they could have identified some activities as being vigorous intensity when they were actually moderate intensity. If so, this underscores the need to remind subjects how to gauge their PA intensity. Second, it is possible that subjects did not follow the instructions they were given regarding PA intensity. Although no injuries resulted from PA performed during this study, the change in vigorous PA underscores the need to remind subjects to avoid vigorous PA to minimize their risk of injury while performing PA.

Household PA also warrants further discussion. In general, there was a decrease in household PA in the intervention group and an increase in household PA in the attention-control group. Both the intervention and attention-control groups increased their leisure-time PA, although the difference between groups was not significant. Although this decrease in household PA in the intervention group could be random variance in the sample, it may also indicate a shift in their priorities. According to Hardcastle and Taylor (2005), the shifting of priorities away from household PA towards leisure-time PA is evidence of older women's development of physically active identities.

In terms of pedometer step counts, it should be noted that pedometer step counts increased in both groups, but fell well below the recommended step counts of 10,000 steps per

day (Tudor-Locke & Bassett, 2004). It is possible that older women fail to perform PA, in part, because they believe it is not possible to perform the amount of PA recommended by public health professionals and primary care providers (e.g. 150 minutes of aerobic PA per week). Therefore, those working with older women who are beginning PA should stress a gradual approach to increasing PA as is recommended by Nelson, et al. (2007).

### **Limitations of the Study**

Several limitations to the study existed. These will be discussed in relation to the risk of error in the statistical conclusions, limitations of the sample, limitations of the intervention itself, and the lack of longitudinal follow-up.

### **Risk of Statistical Conclusion Error**

Threats to statistical conclusion validity specific to this study were low statistical power, the unreliability of treatment implementation, and the restricted range of the dependent variable measures (Shadish, et al., 2002). Statistical power is defined as the probability of finding an effect when the effect exists. Type I (alpha) error refers to incorrectly concluding that cause (e.g. the physically active identity development intervention) and effect (e.g. changes in physically active identities or PA) covary when they do not. Type I error rates were set at  $p < .05$ . Type II (beta) error refers to concluding that they do not covary when they do. Type II error rate was set at .20. Power, then, is 1-beta or .80 (Shadish, et al., 2002).

With the alpha, beta, and power defined, Cohen's (1987) table was used to determine necessary sample size ( $N=52$ ) for detecting differences between two groups. However, the expected sample size was not obtained as only a total  $N=43$  were enrolled. Hypothesis testing

was based on comparisons between two groups that were  $n=12$  in one group and  $n=9$  in the other group. This resulted in low statistical power and a correspondingly high risk of type II error.

Subject attrition threatened statistical power as well. Less than half ( $N=21$ ) of the subjects who enrolled actually completed study activities. Possible solutions to subject attrition may include closer monitoring of chronic health problems during study activities (e.g. partnering with primary care offices while study activities are taking place), providing opportunities for subjects to participate remotely (e.g. telemedicine), and providing caregiving assistance for subjects who are also caregivers (e.g. partnering with adult day care and caregiver agencies to provide caregiving assistance). Future studies also need to plan for attrition rates that are at or above 50%.

The unreliability of treatment implementation reflects intervention fidelity. This was a threat in this study because the PI was not present in the majority of the small group discussion sessions and relied on the group facilitators to preserve the intervention fidelity. Group facilitators were trained in the intervention and attention-control group processes and expressed their readiness to function in this role. While the group facilitators did not notify the PI of any deviations in study procedures, no audio or video recordings were made of study activities. Thus, the PI could not verify the implementation of the intervention and attention-control activities. Future studies may benefit from video or audio recording of activities or the presence of an intervention assessor so that intervention fidelity can be assessed.

Another threat to treatment implementation was the variation in time between the collection of baseline data and the beginning of study activities. Several weeks passed between the collection of baseline data and the beginning of study activities. Individuals who were among

the first to enroll at a site had to wait until others enrolled before they could begin. It is possible that some of the baseline variables, including the dependent variables, changed while subjects were waiting for the study activities to begin.

There was also a varying intervention dose which likely affected treatment implementation. All subjects in the intervention and attention-control groups did not attend every weekly small group discussion session. So, the “dose” of the intervention was different for subjects. Thus, the dose of the intervention needs to be consistent in future studies. Also in terms of the intervention dose, the length and intensity of the intervention (one hour per week for 9 weeks) was chosen by the PI so that each stage of the Physically Active Identity Development Conceptual Model could be discussed in each discussion session. However, this may not be the optimal “dose.” It is possible that by changing the intensity (e.g. more hours per week) or the length (e.g. shorter or longer than nine weeks) of the intervention, the development of physically active identities could be facilitated more quickly. Therefore, the length and intensity of the intervention needs to be explored in future studies.

The restricted range of dependent variables for some subjects threatened statistical conclusion validity (Shadish, et al., 2002). The total sample was used to calculate floor and ceiling effects since there were no significant differences between completers and non-completers in physically active identity scores. Floor effects were seen with the ESDS-acknowledgement subscale and ceiling effects were seen for all of the physically active identity measures. Although the number of subjects affected by floor or ceiling effects was low, this could have influenced study results. Future studies might benefit from utilizing additional measures of physically active identities in addition to the two scales for this study.

### **Limitations of the Sample**

The small sample used for this study was primarily Caucasian. While this was representative of the community in which the study was conducted, it is not representative of the US population as a whole. Prior evidence suggests that conceptualizations of the self differ across cultures (Markus & Kitayama, 1999). Therefore, findings may not be generalizable to older women of differing racial backgrounds. Future studies should test the intervention with older women of diverse racial backgrounds to determine the intervention's efficacy across races.

Another limitation to the sample was the large variation in ages. Ages ranged from the early 50s to the late 90s. Yet, according to Cross and Markus (1991), age affects physically active identity development differently for women at different life stages. So, it is likely that women in their fifth decade of life have different expectations for their identity development than women in their eighth and ninth decade of life. Future studies would benefit from narrowing the age ranges of participants so that subjects were grouped with other women their age.

The potential variation in subjects' health statuses might also have limited the study. Although women had to have at least one chronic condition in order to be eligible for this study, no information was collected on what those chronic conditions were. It is possible that women who were managing more chronic conditions were influenced differently by study activities than those who were managing fewer chronic conditions. It is also possible that women managing conditions perceived as more burdensome (e.g. insulin-dependent diabetes) might have been differently influenced by study activities than women who were managing conditions perceived as being less burdensome (e.g. diabetes controlled by diet). Future studies would benefit from

testing the intervention with individuals with similar chronic conditions or similar numbers of chronic conditions.

Finally, there was no identification of subjects' antecedents to identity development. An important antecedent to physically active identity development was the critical experience that caused the individual to take a "hard look at herself" (Kearney & O'Sullivan, 2003; Medina, 1996). For this study, it was assumed that individuals who expressed interest in this study had undergone this critical experience. However, no measures were taken to confirm that. In retrospect, eligibility criteria could have included some measure of whether or not potential subjects had had a critical experience. For example, those responding to the flyer could have been asked, "What interests you about the study?" Responses to this question could have shed light on what critical experiences, if any, prompted potential subjects to respond to the flyer.

### **Limitations of the Intervention**

Study limitations also concerned the intervention itself. For instance, there was a possible lack of clarity of intervention concepts. Specifically, it was unclear from the easel sheets collected after the group discussion sessions whether or not subjects understood the concept of possible selves. In order to elicit possible selves, subjects privately listed their possible selves on the Possible Selves Questionnaire (Cross & Markus, 1991), adapted to the PA domain (Whaley, 2003), but copies of these were not collected for data analysis purposes. The group facilitator invited subjects to share their possible selves with the group. Any possible selves shared by group members were written on the easel sheets. The comments written on the easel sheets were behaviors (goals), rather than identities (possible selves). This might indicate that subjects did not understand the concept of possible selves and how it was different from goal setting. It might

also indicate that subjects were better able to set goals than to articulate possible selves.

Therefore, in future studies with older women and PA, the concept of possible selves and how it is different from goal setting should be explicated.

Another intervention limitation was the failure to standardize subjects' PA. Subjects were given the freedom to choose whatever PA they wanted. Yet, it is possible that different PA affects the development of physically active identities differently. Although experimenting with PA is explicitly part of the conceptual model, future studies might benefit from standardization of PA. For example, the PI could partner with the institutions with standardized PA programs (e.g. Arthritis Foundation). Then, subjects would still be able to experiment with different delivery methods (e.g. attending a class, doing PA at home, or doing PA in the pool) so that comparisons could be made. It is also possible that some modes of PA (e.g. running) could contribute more significantly to one's development of a physically active identity than other modes of PA (e.g. housework). Future studies would benefit from comparisons of different PA performed with similar intensities, frequencies, and duration.

Another possible limitation of the intervention concerned the use of the EIS and ESDS to measure physically active identities. Although both scales have been used in prior research with older adults (Anderson, et al., 2001; Hays, et al., 2005), both use the terms "exercise" and "exerciser." According to Hardcastle and Taylor (2005), older women associate more with the term "physically active" or "physically inclined" than "exerciser." Subjects might have scored higher on these scales if the language had been changed to "physically active."

Another intervention limitation was in how subjects were asked to document PA. Subjects were instructed to leave blank spaces on days where they performed no PA. However,

because of this, it was not possible to differentiate between missing data and no activity based on the PA Tracking Sheet. This prevented any meaningful analysis of PA frequency based on the tracking sheet data. In retrospect, it would have been helpful to have subjects indicate no activity on a specific day by having them write an “NA” in the box for that day. The documentation of PA was also limited as some subjects documented their purposive PA, but not the duration of that PA. Other subjects documented their pedometer step counts, but not their purposive PA. Therefore, future studies may benefit from scheduling regular “check ins” between the subjects and the PI so that the PI could remind or encourage the subjects to track their PA and pedometer step counts.

### **Lack of Longitudinal Follow-up**

Finally, a limitation was the lack of longitudinal follow up. No subjects were followed beyond the nine-week study period. Yet, critical to any intervention is the extent to which the intervention effects are sustained long-term. This is especially true for PA since the benefits of PA are realized through its long-term continuation (PAGAC, 2008). Future studies should reassess subjects at regular intervals (e.g. 3 months, 6 months, 12 months) to determine if the intervention effects are sustained.

## **Implications for Nursing Education, Practice, and Research**

### **Nursing Education**

Chronic conditions are leading causes of morbidity and mortality. As such, nurses provide much of the care required to manage those conditions. While disease-specific procedures and treatments are included in nursing education, the behavioral strategies aimed at improving patient adherence to procedures and treatments are much less so. According to Jansink and

colleagues (2010), nurses lacked substantive knowledge about lifestyle (e.g. PA) and behavioral counseling (e.g. overcoming barriers) techniques. Yet, evidence suggests that incorporating behavior change techniques in nursing education does increase nurses' efficacy in these techniques (Barta & Stacy, 2005). Thus, incorporating behavior change strategies, including behavior-specific identity development, into basic nursing education is critical to improving nurses' therapeutic skills, and by extension, patient outcomes.

### **Nursing Practice**

Incorporating identity development concepts into nursing practice is also consistent with the human becoming theory of nursing. The identity development process model reflects Parse's (1992) nursing practice methodology of illuminating meaning, synchronizing rhythms, and mobilizing transcendence. Illuminating meaning refers to articulating an individual's reality by uncovering what was, what is, and what will be. Session 2 reflected illuminating meaning by having subjects articulate possible selves and set goals in order to achieve those selves. Session 3 reflected illuminating meaning by having subjects articulate their beliefs about PA, their past experiences with PA, and their PA self-efficacy.

Synchronizing rhythms refers to the person's lived experience of the "now" moment, where successes and struggles are recognized by both the person and the nurse (Parse, 1992). Sessions 4 and 5 reflected synchronizing rhythms by having subjects articulate the types of PA they experimented with, the investments made in performing PA, the competing commitments that stood in the way of performing PA, and the strategies overcome barriers to PA. Synchronizing rhythms was also reflected in session 6 where subjects assessed the affective, cognitive, and physical outcomes of performing PA.

Mobilizing transcendence refers to moving beyond the “now” moment towards the hopes and dreams illuminated through interaction with the nurse (Parse, 1992). Mobilizing transcendence is reflected in sessions 7 and 8 where subjects articulated their identity consolidation and identity evaluations.

### **Nursing Research**

Prior research suggests that health promoting behaviors are adopted and maintained long term if an identity shift occurs (Kearney & O’Sullivan, 2003). Yet, few nursing interventions to this author’s knowledge aimed to facilitate that shift happening. The study’s hypotheses were rejected; however, this study was underpowered to detect differences between groups. Therefore, future physically active identity development studies should retest the intervention with a larger sample with sufficient power in order to verify these findings. Additional intervention testing should focus on the exact dose-response relationship between the conceptual elements of the physically active identity development model and the adoption of PA and on the generalizability of this intervention to other health behaviors and client populations. Finally, longitudinal studies are needed to determine if the identity development intervention effects are maintained over time, since it is the continuation of health promoting behaviors like PA that leads to improvements in health for older adults and those with chronic conditions.

### **Conclusion**

This study tested a theory-based intervention to determine if physically active identities could be facilitated within a constructivist environment. Those who did not complete the study had higher frequency of walking and lower duration of sitting. Among those who completed the study, no significant differences were found between the intervention or attention-control groups

in their change in physically active identities or PA. Study limitations included the high risk of error in the statistical conclusions, limitations of the sample, limitations to the intervention itself, and the lack of any longitudinal follow-up. Implications for nursing education, practice, and research were discussed. Recommendations for future studies were suggested.

APPENDIX A:  
RECRUITMENT FLYERS

(ORIGINAL FLYER)



# RESEARCH STUDY MOTIVATING PHYSICAL ACTIVITY IN OLDER WOMEN

If you are a female who is:

- Aged 50 or older with at least one chronic condition (e.g. arthritis, diabetes, high blood pressure, heart disease, etc.).
- Speaks, reads, and writes in English.
- Currently physically inactive but want to be physically active.
- Available to participate in an hour-long small group discussion session per week for a period of nine weeks.
- Not already participating in any other cognitive-behavioral interventions or physical activity studies.
- Able and willing to participate in physical activity of your own choice.

You may be eligible to participate! For more information, contact:

Kathleen Hall, Doctoral Student, RN

860-0343

[khall@nursing.arizona.edu](mailto:khall@nursing.arizona.edu)

(REVISED FLYER)



Need to exercise but lack  
motivation?

RESEARCH STUDY to MOTIVATE  
OLDER WOMEN to be PHYSICALLY ACTIVE

If you are a female who is:

- Aged 50 or older with at least one chronic condition (e.g. arthritis, diabetes, high blood pressure, heart disease, etc.).
- Speaks, reads, and writes in English.
- Currently physically inactive but wants to be physically active.
- Available to participate in an hour-long small group discussion session per week for a period of nine weeks.
- Not already participating in any other motivational interventions or physical activity studies.
- Able and willing to participate in physical activity of your own choice.

You may be eligible to participate! For more information, contact:

Kathleen Hall, Doctoral Student, RN

860-0343

[khall@nursing.arizona.edu](mailto:khall@nursing.arizona.edu)

APPENDIX B:  
RECRUITMENT PARAGRAPH

Interested in becoming more physically active?

Are you a 50 or older woman?

If yes to both, read on.

A research project is recruiting women, 50 and older, to test a new strategy for motivating women to become more physical active. Over a nine-week period, project activities include attending small group discussion sessions and, on your own, participating in physical activity of your own choice. To find out more, please contact Kathleen Hall MS, RN, at 802.860.0343 or [khall@nursing.arizona.edu](mailto:khall@nursing.arizona.edu).

APPENDIX C:  
ELIGIBILITY SCREENING SCRIPT, PERMISSION TO RELEASE NAME, AND BUSINESS  
CARD COPY

## RECRUITMENT SCRIPT FOR

### THE MOTIVATING PHYSICAL ACTIVITY IN OLDER WOMEN STUDY

“This research study will test a new strategy to motivate physical activity in older women. It is being conducted by Kathleen Hall, a doctoral student in nursing at the University of Arizona who lives in Vermont. Kathleen is seeking women, aged 50 or older, who:

- Have at least one chronic condition (e.g. arthritis, diabetes, high blood pressure, heart disease, etc.).
- Can speak, read, and write in English.
- Are currently physically inactive but who are interested in becoming physically active.
- Are available to participate in an hour-long small group discussion session per week for a period of nine weeks.
- Are not already participating in any other motivational groups or research studies.
- Are able and willing to participate in physical activity of their own choice.

If this sounds like a good match for you, you can contact Kathleen yourself by calling 802-860-0343 or emailing her at [khall@nursing.arizona.edu](mailto:khall@nursing.arizona.edu). If you would prefer that Kathleen contact you, I will need you to sign a release form so I can provide her with your name and telephone number.” (See Permission to Release Name form).

## Motivating Physical Activity Study

## PERMISSION TO RELEASE NAME FORM

I am interested in knowing if I am eligible to participate in the research study to motivate physical activity in older women.

I give my permission for staff to give my name, telephone number, and email address (if applicable) to Kathleen Hall Ph.D. Candidate, RN, so she can contact me regarding this study.

Printed Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



Copy of business card to be given to potential subjects so subjects can contact the Principal Investigator about the study.

APPENDIX D:  
ELIGIBILITY SCREENING FORM

## Eligibility Screening Form

If the answer is yes to questions 1 through 8, the person is eligible for this study.

1. Female?      Yes    No
2. At least age 50 with at least one chronic condition (e.g. has condition that has been present for  $\geq$  three months and requires ongoing medical management)?  
      Yes      No
3. Able to speak English?      Yes      No
4. Meets the definition of physically inactive (e.g. no leisure time PA in the previous month)?    Yes      No
5. Interested in becoming physically active?      Yes      No
6. Available to participate in weekly hour-long small group discussions for a period of nine weeks?      Yes      No
7. Not currently participating in any other motivational interventions or PA studies?  
      Yes      No
8. Willing to participate in PA of own choice (one or any combination of the following: stretching, strengthening, balance, or aerobic exercises and performed in any amount)?    Yes      No

If eligibility criteria are met, write the name, address, and phone number of the individual below. Indicate the date that the home visit is scheduled.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Date of Home Visit: \_\_\_\_\_

APPENDIX E:  
INCLUSION CRITERIA SCREENING TOOLS

Activities of Daily Living*		
ACTIVITIES POINTS (1 OR 0)	INDEPENDENCE: 1 POINT NO supervision, direction or personal assistance	DEPENDENCE: 0 POINTS WITH supervision, direction, personal assistance or total care
BATHING POINTS: _____	(1 POINT) Bathes self completely or needs help in bathing only a single part of the body such as the back, genital area or disabled extremity.	(0 POINTS) Needs help with bathing more than one part of the body, getting in or out of the tub or shower. Requires total bathing.
DRESSING POINTS: _____	(1 POINT) Gets clothes from closets and drawers and puts on clothes and outer garments complete with fasteners. May have help tying shoes.	(0 POINTS) Needs help with dressing self or needs to be completely dressed.
TOILETING POINTS: _____	(1 POINT) Goes to toilet, gets on and off, arranges clothes, cleans genital area without help.	(0 POINTS) Needs help transferring to the toilet, cleaning self or uses bedpan or commode.
TRANSFERRING POINTS: _____	1 POINT) Moves in and out of bed or chair unassisted. Mechanical transferring aides are acceptable.	(0 POINTS) Needs help in moving from bed to chair or requires a complete transfer.
CONTINENCE POINTS: _____	(1 POINT) Exercises complete self control over urination and defecation.	(0 POINTS) Is partially or totally incontinent of bowel or bladder.
FEEDING POINTS: _____	(1 POINT) Gets food from plate into mouth without help. Preparation of food may be done by another person.	0 POINTS) Needs partial or total help with feeding or requires parenteral feeding.

TOTAL POINTS \_\_\_\_\_ 6 = High (independent) 0 = Low (very dependent).

\*Slightly adapted from Katz, S., Down, T.D., Cash, H.R., & Grotz, R.C. (1970) Progress in the development of the index of ADL. *The Gerontologist*, 10, 20-30. Located at <http://www.hartfordign.org/publications/trythis/issue02.pdf>. Accessed January 2008.

## Instrumental Activities of Daily Living\*\*

Scoring: For each category, circle the item description that most closely resembles the client's highest functional level (either 0 or 1).

## 1. ABILITY TO USE TELEPHONE

- 1-Operates telephone on own initiative; looks up and dials numbers, etc.
- 1-Dials a few well known numbers
- 1-Answers telephone but does not dial
- 0-Does not use telephone at all

## 2. SHOPPING

- 1-Takes care of all shopping needs independently
- 0-Shops independently for small purchases
- 0-Needs to be accompanied on any shopping trip
- 0-Completely unable to shop

## 3. FOOD PREPARATION

- 1-Plans, prepares and serves adequate meals independently
- 0-Prepares adequate meals if supplied with ingredients
- 0-Heats and serves prepared meals, or prepares meals but does not maintain adequate diet
- 0-Needs to have meals prepared and served

## 4. HOUSEKEEPING

- 1-Maintains house alone or with occasional assistance (e.g., heavy-work domestic help)
- 1-Performs light daily tasks such as dish-washing and bed-making
- 1-Performs light daily tasks but cannot maintain acceptable level of cleanliness
- 1-Needs help with all home maintenance tasks
- 0-Does not participate in any housekeeping tasks

## 5. LAUNDRY

- 1-Does personal laundry completely
- 1-Launders small items- rinses socks, stockings, etc.
- 0-All laundry must be done by others

## 6. MODE OF TRANSPORTATION

- 1-Travels independently on public transportation or drives own car
- 1-Arranges own travel via taxi, but does not otherwise use public transportation
- 1-Travels on public transportation when accompanied by another
- 0-Travel limited to taxi or automobile, with assistance of another
- 0-Does not travel at all

## 7. RESPONSIBILITY FOR OWN MEDICATION

- 1-Is responsible for taking medication in correct dosages at correct time
- 0-Takes responsibility if medication is prepared in advance in separate dosages
- 0-Is not capable of dispensing own medication

## 8. ABILITY TO HANDLE FINANCES

- 1-Manages financial matters independently (budgets, write checks, pays rent and bills, goes to the bank) collects and keeps track of income
- 1-Manages day-to-day purchases, but needs help with banking, major purchases, etc.
- 0-Incapable of handling money

TOTAL SCORE \_\_\_\_\_

A summary score ranges from 0 (low function, dependent) to 8 (high function, independent) for women.

\*\*From Lawton, M. P. & Brody, E. M. (1969). Assessment of older people: Self-maintaining and instrumental activities of daily living. *Gerontologist*, 9, 179-186.

### The Mini Cog\*\*\*

#### Administration

1. Instruct the client to listen carefully to and remember 3 unrelated words and then to repeat the words.
2. Instruct the client to draw the face of a clock, either on a blank sheet of paper or on a sheet with the clock circle already drawn on the page. After the client puts the numbers on the clock face, ask him/her to draw the hands of the clock to read a specific time.
3. Ask the client to repeat the 3 previously stated words.

#### Scoring

1. Give 1 point for each recalled word after the Clock Drawing Test (CDT) distractor.
2. Clients recalling none of the three words are classified as demented (score=0).
3. Client recalling all three words are classified as non-demented (score=3).
4. Clients with intermediate word recall of 1-2 words are classified based on the CDT (abnormal CDT=demented; normal CDT=non-demented). Note that the CDT is considered normal if all numbers are present in the correct sequence and position, and the hands readably display the requested time.

\*\*\*From Borson, S., Scanlan, J., Brush, M., Vitallano, P., & Dokmak, A. (2000). The mini-cog: A cognitive „vital sign“ measure for dementia screening in multi-lingual elderly. *International Journal of Geriatric Psychiatry, 15*, 1021-1027.

APPENDIX F:  
EXCLUSION CRITERIA SCREENING TOOLS

**Agreement for Researchers using the *Exercise And Screening for You* Research Agreement Form**

The *EASY* Partners request that researchers register their use of *Exercise And Screening for You* materials by providing the information below:

PRINCIPAL INVESTIGATOR: Kathleen Hall MS, RN, Doctoral Student

EMAIL: khall@nursing.arizona.edu

PHONE: 802-860-0343

ORGANIZATION: University of Arizona College of Nursing

TITLE OF PROJECT: Facilitating Physically Active Identity Development in Older Women

FUNDING AGENCY: none

PROJECT DATES: June 2008 to June 2010

PURPOSE OF PROJECT: This doctoral dissertation will test a new intervention to motivate physical activity in older women.

PLEASE DESCRIBE HOW THE EASY MATERIALS WILL BE USED IN THE RESEARCH

PROJECT: The EASY materials will be used during pre-enrollment screening for safety to perform physical activity, and during subjects' orientation to the study.

I have read and agree to abide by all terms and conditions specified in the **Agreement for Researchers using the *Exercise And Screening for You* materials.**

Signature Kathleen Hall  Date May 17, 2008

Please submit signed **Research Agreement Form** (prior to the project) and **Summary of Findings** (at the close of the project) to:

Texas A&M Health Science Center

School of Rural Public Health

Program on Healthy Aging

Mail Stop 1266

University Drive & Adriance Lab Road

College Station, TX 77843-1266

Phone: (979) 458 – 3507

Fax: (979) 458 – 4264

Email: [ahpp@srph.tamhsc.edu](mailto:ahpp@srph.tamhsc.edu)

### Safety to Perform Physical Activity Screen\*

1. Have you experienced chest discomfort, including uncomfortable pressure, squeezing, fullness or pain in the past month and have not been evaluated by your medical provider? Y N
2. Have you experienced discomfort in other areas of the upper body, including pain or discomfort in one or both arms, the back, neck, jaw or stomach in the past month and have not been evaluated by your medical provider? Y N
3. Have you experienced shortness of breath with or without chest discomfort in the past month and have not been evaluated by your medical provider? Y N
4. Have you experienced other signs which may include breaking out in a cold sweat, nausea or light headedness in the past month and have not been evaluated by your medical provider? Y N
5. Have you experienced sudden numbness or weakness of the face, arm or leg, especially on one side of the body in the past month and have not been evaluated by your medical provider? Y N
6. Have you experienced sudden confusion, trouble speaking or understanding in the past month and have not been evaluated by your medical provider? Y N
7. Have you experienced sudden trouble seeing in one or both eyes in the past month and have not been evaluated by your medical provider? Y N
8. Have you experienced sudden trouble walking, dizziness, loss of balance or coordination in the past month and have not been evaluated by your medical provider? Y N
9. Have you experienced sudden, severe headache with no known cause in the past month and have not been evaluated by your medical provider? Y N
10. Have you ever been advised by your medical provider to avoid PA because of a medical condition? Y N
11. Do you have a history of heart failure requiring hospitalization in the last 6 months? Y N
12. Do you have a history of angina or myocardial infarction requiring hospitalization in the last 6 months? Y N
13. Do you require more than monthly medical visits or calls to a health care provider because of diabetes? Y N
14. Have you had any emergency department visits in the past six months and were found to have a potentially life-threatening condition (e.g. cardiovascular or respiratory problems)? Y N
15. Pre-Enrollment Vital Sign Screening:
  - a. BP: \_\_\_\_\_ (must be less than or equal to 160/100)
  - b. Heart rate : \_\_\_\_\_ (Must be less than or equal to 100 beats/min)
  - c. Respiratory rate: \_\_\_\_\_ (Must be less than or equal to 24/min)

\*Created for the purpose of this research using information adapted from the American Heart Association, located at <http://www.heart.org> Accessed April 2008.

Exercise and Screening For You (EASY) QUESTIONS (Circle Response):

Question	Response	
1) Do you have pains, tightness or pressure in your chest during physical activity (walking, climbing stairs, household chores, similar activities)?	Yes	No
2) Do you currently experience dizziness or lightheadedness?	Yes	No
3) Have you ever been told you have high blood pressure?	Yes	No
4) Do you have pain, stiffness or swelling that limits or prevents you from doing what you want or need to do?	Yes	No
5) Do you fall, feel unsteady, or use assistive device while standing or walking?	Yes	No
6) Is there a health reason not mentioned why you would be concerned about starting an exercise program?	Yes	No

Please see the answer sheets for recommended actions and for how to get additional information.

#### EASY RECOMMENDATIONS BASED ON RESPONSES

If you answer **No** to all of the questions on the EASY, follow these four steps to begin or continue your exercise program:

1. Choose enjoyable activities that fit into your everyday routine.
2. Set a goal of being active 30 minutes daily most days of the week (it is best to work toward this goal slowly).
3. Review the safety tips in this packet.
4. Request a free copy of the NIA Exercise Guide by calling 1-800-222-2225 or go to [www.easyforyou.info](http://www.easyforyou.info) for additional exercise options.

If you answered **Yes** to any of the EASY questions, use the recommendations sheet for exercising safely with your condition. It is always a good idea to review the safety hints and be aware of what the experts say are the most appropriate exercises for any specific condition. For each question, we provide a link for further information. Talk with your healthcare provider about your exercise program during your regular visits.

Question	YES
1. Do you have pain, tightness or pressure in your chest during physical activity (walking, climbing stairs, household chores, similar activities)?	If you answered yes to this question and this is a NEW problem, see your health care provider first before starting any exercises. Ask your health care provider “Are there any exercises that I can not do”? Work with your doctor to identify activities that are appropriate for you. If it is not new, or has already been evaluated, begin or continue your exercise program. American Heart Association 1-800-242-8721 <a href="http://www.americanheart.org">http://www.americanheart.org</a>
2. Do you currently experience dizziness or lightheadedness?	If you answered yes, it is recommended that you talk with your health care provider before initiating a new activity program. Ask if there are any exercises you cannot do. Work with your provider to identify exercises good for you. NIH SeniorHealth 1-800-222-2225 <a href="http://seniorhealth.gov/exercise/toc.html">http://seniorhealth.gov/exercise/toc.html</a>
3. Have you ever been told you have high blood pressure?	If your blood pressure has not been checked in the last 6 months, get it checked by a healthcare provider. If you answered yes, you may continue to exercise to improve your overall heart health and prevent disease. American Heart Association 1-800-242-8721 <a href="http://www.americanheart.org">http://www.americanheart.org</a>
4. Do you have pain, stiffness or swelling that limits or prevents you from doing what you want or need to do?	If you answered yes, continue to enjoy your exercise to prevent worsening of your arthritis and help manage your pain. If you have osteoporosis always avoid stretches that flex your spine or cause you to bend at the waist, and avoid making jerky, rapid movements. Call the Arthritis Foundation 1-800-283-7800 for the local office number and for specific exercises for people who have arthritis. Arthritis Foundation 1-800-283-7800 <a href="http://www.arthritis.org">http://www.arthritis.org</a>
5. Do you fall, feel unsteady, or use an assistive device while standing or walking?	If you answered yes, it is recommended that you talk with your health care provider before initiating a new activity program. Ask if there are any exercises you cannot do. Work with your provider to identify exercises good for you. NIH SeniorHealth 1-800-222-2225 <a href="http://seniorhealth.gov/exercise/toc.html">http://seniorhealth.gov/exercise/toc.html</a>
6. Is there a health reason not mentioned why you would be concerned about starting an exercise program?	If you answered yes, SHARE this information with your health care provider. Most reasons can be addressed and you can begin an exercise program that will improve your overall health and well-being.

5/13/2008

## **Agreement for Researchers using the *Exercise And Screening for You***

### **Background:**

The *EASY* Partners own the rights to the *Exercise And Screening for You* instruments/materials. The *EASY* Partners are:

- Program on Healthy Aging, School of Rural Public Health, TAMHSC
- Robert Wood Johnson Foundation
- FirstStep to Active Health
- National Blueprint: Increasing Physical Activity Among Adults Age 50 and Older

We would like to provide *EASY* information to researchers interested in screening, assessment and counseling tools. Researchers are granted some flexibility in how the *EASY* instrument(s) may be used in their studies. They may incorporate the questions, or use the materials as provided by the *EASY* Partners, or modify the assessment instruments.

As you plan your research project, please keep the following in mind:

**Research Agreement Form:** we would greatly appreciate it if you complete a user form and return this so we are aware of use of the tool. You must complete this form (see page 2) and return it to our contact person prior to initiating any research project activities.

**Modifications to the *Exercise And Screening for You* tools:** If you modify the assessment instruments or use them in a format other than the version available from *EASY* Partners, please credit the *EASY* Partners on any print materials or publications as follows:

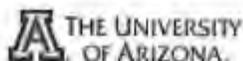
This assessment was adapted/used with permission from the *EASY* Partners who developed the *Exercise And Screening for You* materials. [www.easyforyou.info](http://www.easyforyou.info). Resnick B, Ory MG, Hora K, Rogers ME, Page P, Bolin JN, Lyle RM, Sipe C, Chodzko-Zajko WJ and Bazzarre TL. A New Screening Paradigm and Tool: The Exercise/Physical Activity Assessment and Screening for You (*EASY*). *J Aging Phys Act.* 2008; 16 (2).

**Summary of Findings:** We would greatly appreciate a brief summary of your use of the *EASY* screening tool and associated findings. Please send to:

Texas A&M Health Science Center  
School of Rural Public Health  
Program on Healthy Aging  
Mail Stop 1266  
University Drive and Adriance Lab Road  
College Station, TX 77843-1266  
Phone: (979) 458 – 3507  
Fax: (979) 458 – 4264  
Email: [ahpp@srph.tamhsc.edu](mailto:ahpp@srph.tamhsc.edu)

APPENDIX G:

HUMAN SUBJECTS' PROTECTION PROGRAM APPROVAL FORMS



Human Subjects  
Protection Program

1255 N. Mountain Ave.  
P.O. Box 245137  
Tucson, AZ 85724-5137  
Tel: (520) 626-6721  
<http://irh.arizona.edu>

26 June 2008

Kathleen Hall, Doctoral Student  
Advisor: Cathleen Michaels, PhD  
College of Nursing  
PO Box 210203

**RE: PROJECT NO. 08-0536-02 FACILITATING PHYSICALLY ACTIVE IDENTITY DEVELOPMENT IN OLDER WOMEN**

Dear Ms. Hall:

We received your research proposal as cited above. The procedures to be followed in this study pose no more than minimal risk to participating subjects and have been reviewed by the Institutional Review Board (IRB) through an Expedited Review procedure as cited in the regulations issued by the U.S. Department of Health and Human Services [45 CFR Part 46.110(b)(1)] based on their inclusion under *research categories 4 and 7*. As this is not a treatment intervention study, the IRB has waived the statement of Alternative Treatments in the consent form as allowed by 45 CFR 46.116(d)(2). Please make copies of the attached IRB stamped consent documents to consent your subjects.

Although full Committee review is not required, a brief summary of the project procedures is submitted to the Committee for their endorsement and/or comment, if any, after administrative approval is granted. This project is approved with an **expiration date of 26 June 2009**.

The Institutional Review Board (IRB) of the University of Arizona has a current *Federalwide Assurance* of compliance, *FWA00004218*, which is on file with the Department of Health and Human Services and covers this activity.

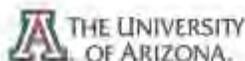
Approval is granted with the understanding that no further changes or additions will be made to the procedures followed without the knowledge and approval of the Human Subjects Committee (IRB) and your College or Departmental Review Committee. Any research related physical or psychological harm to any subject must also be reported to each committee.

A university policy requires that all signed subject consent forms be kept in a permanent file in an area designated for that purpose by the Department Head or comparable authority. This will assure their accessibility in the event that university officials require the information and the principal investigator is unavailable for some reason.

Sincerely,

Elaine G. Jones, PhD, RN, FNAP  
Chair, Social and Behavioral Sciences Human Subjects Committee

EGJ/mm  
cc: Department/College Review Committee



Human Subjects  
Protection Program

1510 E. Helen St.  
P.O. Box 245137  
Tucson, AZ 85724-5137  
Tel: (520) 620-6721  
<http://ocr.spr.arizona.edu/hsp>

### HSP Correspondence Form

**Date:** 06/15/10

**Investigator:** Kathleen Hall, Doctoral Student

**Department:** Nurs

**Advisor:** Cathy Michaels, PhD

**Project No./Title:** 08-0536-02 Facilitating Physically Active Identity Development in Older Women

**Current Period of Approval:** 06/26/10 – 06/25/11

#### IRB Committee Information

IRB2 – IRB00001751

Expedited Review – Continuing Review

FWA Number: FWA00004218

Documents Reviewed Concurrently	Status
Continuing Review Report (received 06/14/10)	Appr
VOTF (version 06/14/10)	Appr

#### Committee/Chair Determination

Approved as submitted effective 06/15/10

#### Additional Determination(s)

- **Continuing Review Category Status – Enrollment Closed: Study Procedure/Intervention Ongoing**
- **Expedite Approval (45 CFR 46.110 Category 4):** Collection of data through noninvasive procedures (not involving general anesthesia or sedation) routinely employed in clinical practice, excluding procedures involving x-rays or microwaves. Where medical devices are employed, they must be cleared/approved for marketing.
- **Expedite Approval (45 CFR 46.110 Category 7):** Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

*Thomas K Park*

06/15/10

Thomas K. Park, PhD  
Co-Chair, IRB 2 Committee  
UA Institutional Review Board  
TKP:mm

Date

**Reminders:** Continuing Review materials should be submitted 30-45 days prior to the expiration date to obtain project re-approval.

- Projects may be concluded or withdrawn at any time using the forms available at <http://ocr.spr.arizona.edu/irb>.
- No changes to a project may be made prior to IRB approval except to eliminate apparent immediate hazard to subjects.
- Original signed consent forms must be stored in the designated departmental location determined by the Department Head.

APPENDIX H:  
BASELINE DATA COLLECTION FORMS

## BASELINE DATA FORM\*

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Age: \_\_\_\_\_
2. Marital Status: S M D W
3. Employment History: Still Employed FT PT Not Employed
4. Racial/Ethnic Background: Caucasian Black Asian Hispanic  
Native American Middle Eastern
5. Primary Language Spoken in Home: \_\_\_\_\_
6. Socio-economic Status: More Than Enough Enough Less Than Enough
7. Health Status: Excellent Good Fair Poor
8. Is physical activity socially appropriate for older women?  
Absolutely Maybe Definitely Not
9. How fearful are you that you will become injured as a result of performing physical activity?  
Very Fearful Slightly Fearful Neutral Not Fearful
  - a. To what extent do you fear being injured by the physical activity itself?  
Very Fearful Slightly Fearful Neutral Not Fearful
  - b. To what extent do you fear becoming the victim of crime when you are performing physical activity? Very Fearful Slightly Fearful Neutral Not Fearful
  - c. To what extent do you fear being injured by the environment when you are performing physical activity? Very Fearful Slightly Fearful Neutral Not Fearful
10. How far do you have to travel to perform physical activity?  
Less than 1 mile 1-5 miles More than 5 miles
11. How much trouble is it to attend a physical activity class?  
Very Much Some Not At All
12. Have you ever been physically active at any time of your life? Yes No  
If yes, can you please describe when that was and what kind of activities you did?

---

\*This form was created for this study.

### The Rosenberg Self-Esteem Scale\*

Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle SA. If you agree with the statement, circle A. If you neither agree nor disagree, circle N. If you disagree, circle D. If you strongly disagree, circle SD.

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
I feel that I'm a person of worth, at least on an equal plane with others.	SA	A	N	D	SD
I feel that I have a number of good qualities.	SA	A	N	D	SD
All in all, I am inclined to feel that I am a failure.	SA	A	N	D	SD
I am able to do things as well as most other people.	SA	A	N	D	SD
I feel I do not have much to be proud of.	SA	A	N	D	SD
I take a positive attitude toward myself.	SA	A	N	D	SD
On the whole, I am satisfied with myself.	SA	A	N	D	SD
I wish I could have more respect for myself.	SA	A	N	D	SD
I certainly feel useless at times.	SA	A	N	D	SD
At times I think I am not good at all.	SA	A	N	D	SD

\*From Rosenberg, M. (1965). *Society and the Adolescent Self-Image*. Princeton, NJ: Princeton University Press. Located at [http://www.bsos.umd.edu/socy/grad/socpsy\\_rosenberg.html](http://www.bsos.umd.edu/socy/grad/socpsy_rosenberg.html) Accessed November 2007.

## Self-Monitoring Scale\*

Item	True	False
I find it hard to imitate the behavior of other people.	T	F
At parties and social gatherings, I do not attempt to do or say things that others will like.	T	F
I can only argue for ideas which I already believe.	T	F
I can make impromptu speeches even on topics about which I have almost no information.	T	F
I guess I put on a show to impress or entertain others.	T	F
I would probably make a good actor.	T	F
In a group of people, I am rarely the center of attention.	T	F
In different situations and with different people, I often act like very different persons.	T	F
I am not particularly good at making other people like me.	T	F
I'm not always the person I appear to be.	T	F
I would not change my opinions (or the way I do things) in order to please someone or win their favor.	T	F
I have considered being an entertainer.	T	F
I have never been good at games like charades or improvisational acting.	T	F
I have trouble changing my behavior to suit different people and different situations.	T	F
At a party I let others keep the jokes and stories going.	T	F
I feel a bit awkward in public and do not show up quite as well as I should.	T	F
I can look anyone in the eye and tell a lie with a straight face (if for a right end).	T	F
I may deceive people by being friendly when I really dislike them.	T	F

\*From Gangestad, S. & Snyder, M. (1985). "To carve nature at its joints": On the existence of discrete classes in personality. *Psychological Review*, 92, 317-349.

## Ego Resiliency Scale\*

	Does not apply at all	Applies slightly	Applies somewhat	Applies very strongly
I am generous with my friends.	1	2	3	4
I quickly get over and recover from being startled.	1	2	3	4
I enjoy dealing with new and unusual situations.	1	2	3	4
I usually succeed in making a favorable impression on people.	1	2	3	4
I enjoy trying new foods I have never tasted before.	1	2	3	4
I am regarded as a very energetic person.	1	2	3	4
I like to take different paths to familiar places.	1	2	3	4
I am more curious than most people.	1	2	3	4
Most of the people I meet are likable.	1	2	3	4
I usually think carefully about something before acting.	1	2	3	4
I like to do new and different things.	1	2	3	4
My daily life is full of things that keep me interested.	1	2	3	4
I would be willing to describe myself as a pretty “strong” personality.	1	2	3	4
I get over my anger at someone reasonably quickly.	1	2	3	4

\*From Block, J. & Kremen, A. M. (1996). IQ and ego-resiliency: Conceptual and empirical connections and separateness. *Journal of Personality and Social Psychology*, 70, 349–361.

## Exercise Identity Scale\*

Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I consider myself an exerciser.	1	2	3	4	5
When I describe myself to others, I usually include my involvement in exercise.	1	2	3	4	5
I have numerous goals related to exercising.	1	2	3	4	5
Physical exercise is a central factor to my self-concept.	1	2	3	4	5
I need to exercise to feel good about myself.	1	2	3	4	5
Others see me as someone who exercises regularly.	1	2	3	4	5
For me, being an exerciser means more than just exercising.	1	2	3	4	5
I would feel a real loss if I were forced to give up exercising.	1	2	3	4	5
Exercising is something I think about often.	1	2	3	4	5

\*From Anderson, D. F. & Cychosz, C. M. (1994). Development of an exercise identity scale. *Perceptual and Motor Skills*, 78, 747-751.

Exercise Self-Definition Scale\*

Indicate your answer to each question by circling the number that corresponds with your response. Circling (0) indicates “Not at All.” Circling (10) indicates “Very Much.”

	Not at All										Very Much
To what extent do you consider yourself an exerciser?	0	1	2	3	4	5	6	7	8	9	10
How much of an exerciser do you think your relatives would say you are?	0	1	2	3	4	5	6	7	8	9	10
How much of an exerciser do you think your friends would say you are?	0	1	2	3	4	5	6	7	8	9	10
How much of an exerciser do you think other exercisers would say you are?	0	1	2	3	4	5	6	7	8	9	10
To what extent do or would you enjoy being an exerciser?	0	1	2	3	4	5	6	7	8	9	10
How important is it to you that you are known as an exerciser?	0	1	2	3	4	5	6	7	8	9	10
How important is it to you that you get some exercise?	0	1	2	3	4	5	6	7	8	9	10
How important is it to you that people you care about get some exercise?	0	1	2	3	4	5	6	7	8	9	10
Compared to others your age, how good are you at exercise?	0	1	2	3	4	5	6	7	8	9	10
Compared to others your age, how good are you at walking?	0	1	2	3	4	5	6	7	8	9	10
Compared to others your age, how good are you at stretching?	0	1	2	3	4	5	6	7	8	9	10

\*From Hays, L. M., Damush, T. M., & Clark, D. O. (2005). Relationship between exercise self-definitions and exercise participation among urban women in primary care. *Journal of Cardiovascular Nursing*, 20, 9-17.

## INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE\*

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

1. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?
  - \_\_\_\_\_ days per week
  - \_\_\_\_\_ No vigorous physical activities —————→ *Skip to question 3*
  
2. How much time did you usually spend doing vigorous physical activities on one of those days?
  - \_\_\_\_\_ hours per day
  - \_\_\_\_\_ minutes per day
  - \_\_\_\_\_ Don't know/Not sure

Think about all the moderate activities that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.
  - \_\_\_\_\_ days per week
  - \_\_\_\_\_ No moderate physical activities —————→ *Skip to question 5*
  
4. How much time did you usually spend doing moderate physical activities on one of those days?
  - \_\_\_\_\_ hours per day
  - \_\_\_\_\_ minutes per day
  - \_\_\_\_\_ Don't know/Not sure

Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the last 7 days, on how many days did you walk for at least 10 minutes at a time?  
\_\_\_\_\_ days per week  
\_\_\_\_\_ No walking      —→ *Skip to question 7*
6. How much time did you usually spend walking on one of those days?  
\_\_\_\_\_ hours per day  
\_\_\_\_\_ minutes per day  
\_\_\_\_\_ Don't know/Not sure

The last question is about the time you spent sitting on weekdays during the last 7 days. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the last 7 days, how much time did you spend sitting on a week day?  
\_\_\_\_\_ hours per day  
\_\_\_\_\_ minutes per day  
\_\_\_\_\_ Don't know/Not sure

This is the end of the questionnaire, thank you for participating.

APPENDIX I:  
PHYSICAL ACTIVITY TRACKING SHEET

## Motivating Physical Activity in Older Women

### Physical Activity Tracking Sheet\*

Name: \_\_\_\_\_ Age: \_\_\_\_\_

Address: \_\_\_\_\_

---

In each box, record the type of physical activity you did, the total number of minutes you were active for, and indicate the number of steps counted on your pedometer.

Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Example Date:							
Week 1 Date:							
Week 2 Date:							
Week 3 Date:							
Week 4 Date:							
Week 5 Date:							
Week 6 Date:							
Week 7 Date:							
Week 8 Date:							
Week 9 Date:							

\*Adapted from Vermont Department of Health (2008c). Get Moving Vermont. Located at <http://www.healthvermont.gov/family/move/index.aspx> Accessed January 2008.

APPENDIX J:  
GROUP FACILITATOR TRAINING

## GROUP FACILITATOR TRAINING

1 <sup>st</sup> Hour	Introductions Review of Human Subjects Protection Principles of Group Facilitation
	Break
2 <sup>nd</sup> Hour	Group Facilitation Role Play Wrap-Up and Evaluation

Reasons for Using Small Groups to Foster Learning\*  
(Adapted from Westberg & Jason,  
*Fostering Learning in Small Groups*)

1. Learners gain a sense of ownership of the learning process.
2. Learners build their own knowledge. Knowledge built is knowledge understood.
3. Learners can practice skills in a safe environment so that skills will be more rehearsed when applied in the "real" setting.
4. Communication skills are enhanced because opportunities to give and to receive feedback are provided.
5. Learners learn from each other rather from "experts" who sometimes cannot explain content at the level needed by the learner.
6. Learners can be exposed to others' points of view.

\*Adapted from Florida State University College of Medicine (2007). Small group facilitation skills and small group learning. Located at <http://med.fsu.edu/education/FacultyDevelopment/small%20group%20skills.asp> Accessed January 2008.

### Characteristics of Effective Groups\*

1. All group members work toward the building of a “learning team.”
2. Everyone feels and takes responsibility for the group’s success.
3. The group sees a relationship between their work and rewards.
4. The group knows and uses behaviors as follows:
  - Learns to deal with conflict and practice these skills.
  - Communicates clearly and directly with each other.
  - Asks for clarification instead of letting discussion go on.
  - Does not pre-judge each other.
  - Values differences.
  - Focuses on content and group process, not just on content.
  - Stays focused.
  - Collaborates with others.
  - Understands that conflict helps them get to know each others’ views.
  - Is cautious with regard to judging others non-verbal behaviors.
  - Senses when things are not going well and makes efforts to self-correct.
  - Understands how personality preferences can influence group dynamics.
  - Establishes and agrees to follow ground rules.

\*Adapted from Florida State University College of Medicine (2007). Small group facilitation skills and small group learning. Located at <http://med.fsu.edu/education/FacultyDevelopment/small%20group%20skills.asp> Accessed January 2008.

### Facilitator Behaviors/Skills\*

- Actively listens, observes, and remembers behaviors and conversations.
- Asks questions that facilitate the group process.
- Intervenes when ineffective behaviors occur.
- Provides feedback without creating defensive reactions.
- Accepts feedback without being defensive.
- Provides support and encouragement to group members.
- Identifies when the group has acted inconsistent with its ground rules.
- Helps analyze when things go well and when things go wrong.
- Evaluates the group process.

\*Adapted from Florida State University College of Medicine (2007). Small group facilitation skills and small group learning. Located at <http://med.fsu.edu/education/FacultyDevelopment/small%20group%20skills.asp> Accessed January 2008.

## GROUP FACILITATOR TRAINING

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. I understand what is required of me for the protection of human subjects.	5	4	3	2	1
2. I understand what makes an effective group.	5	4	3	2	1
3. I understand the behaviors and skills associated with a group facilitator.	5	4	3	2	1
4. I am better prepared to function in my role as a group facilitator.	5	4	3	2	1

APPENDIX K:  
SMALL GROUP ORIENTATION MATERIALS

## SESSION 1: ORIENTATION

- Introductions:
  - What is your name?
  - Describe one of your favorite activities.
- Group Expectations:
  - Everyone is expected to participate during each session.
  - Please be punctual.
  - Attendance is expected at every session.
- Ground Rules:
  - Try to prepare for and attend every session.
  - Show up on time.
  - Maintain confidentiality.
  - Listen respectfully.
  - Avoid "put-downs" or disrespectful behavior.
  - Use an "I" perspective as much as possible.

## EXERCISE & SCREENING FOR YOU SAFETY TIPS

Follow these EASY safety tips for when to start and stop exercise. Use the recommendations below for exercising safely with your condition.

### Exercise Safety Tips to Always Consider Prior to Starting Exercise

- Always wear comfortable, loose-fitting clothing and appropriate shoes for your activity.
- Warm up: Perform a low to moderate intensity warm-up for 5-10 minutes.
- Drink water before, during and after your exercise session.
- When exercising outdoors, evaluate your surroundings for safety: traffic, pavement, weather, and strangers.
- Wear clothes made of fabrics that absorb sweat and remove it from your skin.
- Never wear rubber or plastic suits. These could hold the sweat on your skin and make your body overheat.
- Wear sunscreen when you exercise outdoors.

### Exercise Safety Tips for When to STOP Exercising

Stop exercising right away if you:

- Have pain or pressure in your chest, neck, shoulder, or arm.
- Feel dizzy or sick.
- Break out in a cold sweat.
- Have muscle cramps.
- Feel acute (not just achy) pain in your joints, feet, ankles, or legs.
- Slow down if you have trouble breathing. You should be able to talk while exercising without gasping for breath.

### Exercise Safety Tips to Recognize Days/Times When Exercise Should NOT be Initiated:

- Avoid hard exercise for 2 hours after a big meal. (A leisurely walk around the block would be fine).
- Do not exercise when you have a fever and/or viral infection accompanied by muscle aches.
- Do not exercise if your systolic blood pressure is greater than 200 and your diastolic is greater than 100.

- Do not exercise if your resting heart rate is greater than 120.
- Do not exercise if you have a joint that you are using to exercise (such as a knee or an ankle) that is red and warm and painful.
- If you have osteoporosis, always avoid stretches that flex your spine or cause you to bend at the waist, and avoid making jerky, rapid movements.
- Stop exercising if you experience severe pain or swelling in a joint. Discomfort that persists should always be evaluated.
- Do not exercise if you have a new symptom that has not been evaluated by your health care provider such as pain in your chest, abdomen or a joint, swelling in an arm, leg or joint, difficulty catching your breath at rest, or a fluttering feeling in your chest.

Additional Safety Information is provided at the National Institute of Health Web page [www.nlm.nih.gov/medlineplus/safety.html](http://www.nlm.nih.gov/medlineplus/safety.html)

## EXERCISE & SCREENING FOR YOU LINKS & RESOURCES

### General Exercise Options:

- American Heart Association  
<http://www.americanheart.org/presenter.jhtml?identifier=1200013>
- International Council on Active Aging [www.icaa.cc/PressInfo/onehouradayrelease.htm](http://www.icaa.cc/PressInfo/onehouradayrelease.htm)
- International Society for Aging & Physical Activity [www.isapa.org/ISAPA\\_Newsletter](http://www.isapa.org/ISAPA_Newsletter)
- National Blueprint: Increasing Physical Activity Among Adults Age 50 & Older  
[www.agingblueprint.org/tips.cfm](http://www.agingblueprint.org/tips.cfm)
- NIH SeniorHealth [nihseniorhealth.gov/exercise/toc.html](http://nihseniorhealth.gov/exercise/toc.html)
- Novartis Health & Age [www.healthandage.org](http://www.healthandage.org)
- President's Council on Physical Fitness & Sports [www.fitness.gov](http://www.fitness.gov)
- The Canadian Centre for Activity & Aging's Home Support Exercise Program. Geriatrics & Aging [www.geriatricsandaging.ca/PDF/PDFJuly2003/0607homesupport.pdf](http://www.geriatricsandaging.ca/PDF/PDFJuly2003/0607homesupport.pdf)

### Physical Activities for Nonambulatory Older Adults:

- Video Press: University of Maryland School of Medicine
  - Improving Function – Improving Life
  - The Nursing Assistant's Role as Cheerleader & "Personal Trainer"
  - Function – A Quality Indicator: The GNA's Role
  - Restorative Care: It's Mandated
  - Exercise Prescription: Staff Information
  - Exercise for Fitness of Ambulatory Elders
  - Exercise for Fitness of Non-ambulatory Elders
  - Bed Exercise [www.videopress.org](http://www.videopress.org)
- Funcercise: Seniors Exercise & Rehabilitation Videos [www.funcercise.com/elderly-senior-seniors-fitness-exercise-exercises-weight-training-video-videos.html](http://www.funcercise.com/elderly-senior-seniors-fitness-exercise-exercises-weight-training-video-videos.html)
- Gymhome: Live Exercises: A Sitting Exercise Program  
<http://www.gymhome.com/english/ejerciciosEnVivo/programa.php?L1=3>
- Sit To Be Fit - The Sitting Exercise Training Manual  
[www.fitnessandfreebies.com/sit2benefit.html](http://www.fitnessandfreebies.com/sit2benefit.html)
- Sitting Exercise Program for Individuals with Ataxia [www.internaf.org/ataxia/exercise.html](http://www.internaf.org/ataxia/exercise.html)
- Sport Coach: Static Stretching Exercises [www.brianmac.demon.co.uk/stretch.htm](http://www.brianmac.demon.co.uk/stretch.htm)
- Stretching Exercises ESO.ORG  
[www.eso.org/safety/Archive/Exercise\\_sit/sitting\\_exercise.ppt](http://www.eso.org/safety/Archive/Exercise_sit/sitting_exercise.ppt)
- Women's Heart Foundation: Stretching Exercise  
[www.womensheartfoundation.org/content/Exercise/stretching\\_exercise.asp](http://www.womensheartfoundation.org/content/Exercise/stretching_exercise.asp)

### Cardiovascular Specific Exercise Programs/Information:

- American College Sports Medicine: Exercise & the Older Adult  
[www.acsm.org/pdf/EOA.pdf](http://www.acsm.org/pdf/EOA.pdf)
- Cardiovascular Institute & Center for Cardiovascular Health  
[www.mssm.edu/cvi/exercise.shtml](http://www.mssm.edu/cvi/exercise.shtml)

- Centers for Disease Control: Strength Training for Older Adults: Why Strength Training?  
[www.cdc.gov/nccdphp/dnpa/physical/growing\\_stronger/why.htm](http://www.cdc.gov/nccdphp/dnpa/physical/growing_stronger/why.htm)
- Human Kinetics: Benefits of Aerobic Endurance Training for Older Adults  
[www.humankinetics.com/products/showproduct.cfm?isbn=0736045139](http://www.humankinetics.com/products/showproduct.cfm?isbn=0736045139)
- The Physician & Sportsmedicine  
[www.physsportsmed.com/issues/1999/10\\_15\\_99/kligman.htm](http://www.physsportsmed.com/issues/1999/10_15_99/kligman.htm)
- Women's Heart Foundation  
[www.womensheartfoundation.org/content/Exercise/intro\\_to\\_exercise.asp](http://www.womensheartfoundation.org/content/Exercise/intro_to_exercise.asp)

#### Exercises for Dizziness or Lightheadedness:

- AARP Better Balance Prevents Falls  
[www.aarp.org/prevention/better\\_balance\\_prevents\\_falls](http://www.aarp.org/prevention/better_balance_prevents_falls)
- American Physical Therapy Association Head to Toe Program (Level 1)  
[headtoe.apta.org/kbase/frame/ug117/ug1176/frame.htm](http://headtoe.apta.org/kbase/frame/ug117/ug1176/frame.htm)
- American Physical Therapy Association Head to Toe Program (Level 2)  
[headtoe.apta.org/kbase/frame/ug128/ug1287/frame.htm](http://headtoe.apta.org/kbase/frame/ug128/ug1287/frame.htm)
- American Physical Therapy Association What You Need to Know About Falls  
[www.physicaltherapy.about.com/](http://www.physicaltherapy.about.com/)
- Mayo Clinic Senior Health on Balance Exercises  
[www.mayoclinic.com/health/balanceexercises/](http://www.mayoclinic.com/health/balanceexercises/)

#### Exercises for Joint problems:

- American College of Rheumatology  
[www.rheumatology.org/public/factsheets/exercise\\_new.asp](http://www.rheumatology.org/public/factsheets/exercise_new.asp)
- American Physical Therapy Association-Exercising with Osteoarthritis  
[headtoe.apta.org/kbase/as/tr4782/actionset.htm](http://headtoe.apta.org/kbase/as/tr4782/actionset.htm)
- Arthritis Foundation: The 12 Week Walking Plan  
[www.arthritis.org/media/12%20week%20walking%20plan%20pdf.pdf](http://www.arthritis.org/media/12%20week%20walking%20plan%20pdf.pdf)
- Arthritis Organization [www.arthritis.org/conditions/exercise](http://www.arthritis.org/conditions/exercise)
- Centers for Disease Control  
[www.cdc.gov/nccdphp/dnpa/physical/growing\\_stronger/exercises/warmup.htm](http://www.cdc.gov/nccdphp/dnpa/physical/growing_stronger/exercises/warmup.htm)
- Human Kinetics [www.humankinetics.com/products/showproduct.cfm?isbn=0736045139](http://www.humankinetics.com/products/showproduct.cfm?isbn=0736045139)
- National Arthritis Foundation [www.arthritis.org.sg/101/treat/exercise.html](http://www.arthritis.org.sg/101/treat/exercise.html)
- National Guideline Clearing House: Exercise Program for Osteoarthritis [www.guideline.gov/summary/summary.aspx?](http://www.guideline.gov/summary/summary.aspx?)
- National Institute of Arthritis & Musculoskeletal & Skin Disorders  
[www.niams.nih.gov/hi/topics/arthritis/arthexfs.htm](http://www.niams.nih.gov/hi/topics/arthritis/arthexfs.htm)

#### Exercises with Assistive Devices:

- American Heart Association: Description of Exercise Recommendations for Stroke Patients  
[circ.ahajournals.org/cgi/content/full/109/16/2031](http://circ.ahajournals.org/cgi/content/full/109/16/2031)
- The Center for Neurological Study [www.cnsonline.org/www/archive/parkins/park-03.html](http://www.cnsonline.org/www/archive/parkins/park-03.html)
- Cleveland Clinic [www.webmd.com/content/article/46/1833\\_50756](http://www.webmd.com/content/article/46/1833_50756)

- Victorian Government: Regular Exercise Program for Parkinson's Disease Patients  
[www.betterhealth.vic.gov.au/bhcv2/bhcarticles.nsf/pages/Parkinson's\\_disease\\_and\\_exercise?OpenDocument](http://www.betterhealth.vic.gov.au/bhcv2/bhcarticles.nsf/pages/Parkinson's_disease_and_exercise?OpenDocument)

Overall Good Exercises:

- Body Strengthening for Seniors [www.exercise.about.com/cs/exerciseworkouts/](http://www.exercise.about.com/cs/exerciseworkouts/)
- Body Stretching for Seniors [www.exercise.about.com/od/yogapilatesflexibility/](http://www.exercise.about.com/od/yogapilatesflexibility/)
- Centers for Disease Control  
[www.cdc.gov/nccdphp/dnpa/physical/growing\\_stronger/exercises/index.htm](http://www.cdc.gov/nccdphp/dnpa/physical/growing_stronger/exercises/index.htm)
- National Institute on Aging  
[www.nia.nih.gov/HealthInformation/Publications/ExerciseGuide/chapter04.htm](http://www.nia.nih.gov/HealthInformation/Publications/ExerciseGuide/chapter04.htm)

# Active Older Adult Resource Guide

## Health Clubs

All American Fitness and Training Center	
Contact	Rick or Dave
Address	1881 Williston Road, South Burlington
Phone Number	(802) 865-3068
Description	Unlimited tanning, open 24 hours, free spinning, free day care, cardio-box
Availability/hrs.	Open 24 hours
Supervision	Two certified trainers
Cost	Over 50 fitness rate. Special discount - \$38.99 per month includes everything. One year contract negotiable.
Accessibility	Open 24 hours on Williston Road and Kennedy Drive
Other	Rick is 52 years old and is the past Mr. America for 1985. He wrote the Book on <i>Fitness Super Shape – Today</i>
The Fitness Center	
Contact	Christine LaDuke
Address	29 Church Street, Burlington, VT 05401
Phone Number	(802) 651-8773
Description	Health Club – full fitness facility
Availability/hrs.	Mondays through Fridays - 6:00 .am. - 8:30 pm, Saturdays - 8:00 a.m. - 4:00 p.m., and Sundays 9:00 a.m. - 4:00 p.m.
Supervision	Certified Personal Trainers
Cost	Varied, call for more info
Accessibility	Right on Church Street below Borders Books
Other	New equipment and many upgrades.
Greater Burlington YMCA	
Contact	Kevin Hatin
Address	266 College Street, Burlington, Vermont 05401
Phone Number	(802) 862-9622
Description	“Forever Fit” Gym and pool programs, Free Senior Swim (Friday, 2:00 - 4:00 p.m.), Senior Strength Training, Diabetes exercise class, Yoga, “Prime Time” Fitness over 55 cardio classes.

Availability/hrs.	8 week sessions available. Monday - Friday (6 am – 10 pm), Saturday (7 am - 8 pm), Sunday (8 am - 7 pm)
Supervision	Certified, CPR trained instructors – Lifeguards on duty
Cost	Price varies based on program and membership. Financial assistance available
Accessibility	Parking is on the street. Wheelchair accessible through rear entrance
Other	For adults over 50. Memberships optional
<b>Jazzercise of Burlington</b>	
Contact	Pamela Fontaine
Address	Heineberg Senior Center, 14 Heineberg Road, Burlington 05401
Phone Number	(802)951-1133 or <a href="http://www.jazzercise.com">www.jazzercise.com</a>
Description	Simply Jazzercise: Simple walking/marching patterns combined with strength training to provide overall conditioning. Very safe, very effective for the active older adult
Availability/hrs.	Monday - 10:30 am, Thursday - 10:30 am, Friday 10:30 am also Strength Training - Tuesday and Thursday 10:15
Supervision	Instructor and Class Manager on-site incase of emergency
Cost	1 <sup>st</sup> class free! \$25.00 EFT per month. \$69/8 weeks. \$5.00 walk in.
Accessibility	Wheelchair accessible
Other	Class time may change, please call ahead to confirm. Open program also appropriate for individuals that are overweight, have CFS/Fibramyalgia, other chronic illnesses that may hinder their ability to exercise, and individuals recovering from injury.
<b>The Olympiad Health Racquet Fitness Club</b>	
Contact	Michael Provost
Address	70 Farrell Street, South Burlington, Vermont 05403
Phone Number	(802) 863-4299
Description	“ <i>Health through Fitness</i> ”. 36 sessions, physical therapy screening, strength, cardiovascular and flexibility training. All in individual prescriptions including cardiac and diabetes limitations
Availability/hrs.	Individual appointments and schedules set up. Three times a

	week between 6:00 a.m. and 9:00 p.m., Monday through Friday
Supervision	One on One, In-house certified trainer, 36 sessions
Cost	Reference Senior Discount
Accessibility	*Must be able to climb stairs to get to club. Doctor's approval form is needed.
<b>The Racquet's Edge</b>	
Contact	Ann Hughes
Address	4 Morse & Gaithier Drive, Essex Junction, Vermont 05452
Phone Number	(802) 879-7734
Description	" <i>The Plus Side</i> " Exercise classes, chair, Tai Chi, aquatic exercise programs, arthritis program, yoga, indoor track, climbing wall, tennis, racquetball, dance classes plus social activities, such as bridge, monthly luncheons and "coffee break". Free senior swims on Friday from 11:30 a.m. - 1 p.m. Grandparent swims on Sundays 11:30 a.m. - 1 p.m.
Availability/hrs.	Please call for current program calendar. Monday - Thursday 5:00 a.m. - 10:30 p.m., Friday 5:00 am-9:00 pm Saturdays 7:00 a.m. - 8:00 p.m. and Sundays 7:00 a.m. - 9:00 p.m.
Supervision	There is a trainer available Monday, Wednesday and Friday for the equipment.
<b>Twin Oaks</b>	
Contact	Sherry Brown
Address	75 Farrell Street, So. Burlington, Vermont 05403
Phone Number	(802) 658-0002
Description	"Senior Golden Oaks" Wellness consultation, strength training, planned health and fitness program, wide variety of classes on land and in water, indoor track, monthly coffee socials, lecture services, monthly blood pressure checks, grandparent preschooler play dates, social brunches
Availability/hrs.	Call for schedule of events. Designated hours at Farrell Street (especially for Golden Oaks Members) Open all day seven days a week.
Supervision	Certified instructors are CPR trained. Lifeguards on duty. Senior Fitness Association Certified Personal Trainer for consultation
Cost	Memberships available 3 months – 1 year. Call for pricing. Rehabilitation memberships also available.

Accessibility	Pool is accessible, as is the entire facility. Ample parking
Other	Designed for those over 60
<b>The Woolen Mill Health Club</b>	
Contact	Jackie Fillion
Address	20 West Canal Street, Winooski 05404
Phone Number	(802) 655-2399
Description	Full facility, nautilus, free weights, cardio machines, aqua aerobics. Senior aerobics, Ashtanga Yoga, Jazzercise
Availability/hrs.	Monday – Thursday, 6:00 am – 9:30 pm, Friday 6: am – 9:00 pm, Saturday and Sunday, 9 am – 5 pm
Supervision	Trainers on duty all the time
Cost	Call for pricing
Accessibility	Handicap parking in rear, a few steps to pool
Other	Pool temperature is 84 degrees

## Programs in Senior Housing

<b>Converse Home</b>	
Contact	Amy Jelen
Address	272 Church Street, Burlington, Vermont 05401
Phone Number	(802) 862-0401
Description	Twice a week chair exercise and stretch program.
Availability/hrs.	Tuesdays and Fridays, 10:30 a.m. - 11:15 a.m.
Supervision	Certified exercise instructor
Cost	Limited to Converse Home residents due to space constraints.
Accessibility	Wheelchair accessible
<b>Wake Robin</b>	
Contact	Susan DuCharme, Activities Coordinator
Address	200 Wake Robin Drive, Shelburne, Vermont 05482
Phone Number	(802) 264-5100
Description	Exercise room and fitness equipment, Fitness programs including: Tai Chi, stretching and yoga. On-site trails for walking and cross-country skiing. Aquatic Center offering aquatic classes, PT and lap/free swim time
Availability/hrs.	For residents only.
Supervision	Depends on activity, no lifeguard at pool, some monitored swim times.

Cost	Cost depends on class. Exercise Room, Aquatic class and lap/free swim are free
Accessibility	Wake Robin is fully accessible
Other	Must be a resident of Wake Robin
Williston Woods Cooperative Housing Corporation	
Contact	Sabina Chabot
Address	126 Williston Woods Road, Williston, Vermont 05495
Phone Number	(802) 879-1740
Description	T'ai Chi, stretching, strength training
Availability/hrs.	3 times a week (Mon, Wed, Fri) 8:00 am – 9:00 am, winter hours 9-10 am
Supervision	Resident instructor
Cost	FREE
Accessibility	Wheelchair accessible
Other	Residents only. Must sign a waiver

## Programs in Senior Centers

Champlain Community Senior Center	
Contact	Syndi Zook
Address	7 Aspen Drive, S. Burlington, Vermont 05403
Phone Number	(802) 658-3585
Description	T'ai Chi, Yoga, Armchair aerobics, beginner and intermediate aerobics, line dancing, percussion group, strength training, intergenerational dance group, walking club and Jazzercise, painting, book club.
Availability/hrs.	Call for schedule. Schedule changes monthly.
Supervision	Instructor led classes
Cost	Most classes are free
Accessibility	Fully accessible.
Other	People over 55 years of age
Essex Junction Senior Center	
Contact	Kay Helfrich
Address	2 Lincoln Hall, Essex Junction
Phone Number	(802) 878-6940
Description	" <i>Sit and Fit</i> " Video exercise on Fridays.
Availability/hrs.	Call for availability.

Cost	FREE
<b>Heineberg Senior Center</b>	
Contact	Gail Moreau
Address	14 Heineberg Road, Burlington, Vermont 05401 champlainseniorcenter.org
Phone Number	(802) 863-3982
Description	Tai Chi, Line dancing with opportunity to join the performance group, "The High Steppers", Tap class, Beginner and intermediate aerobics and strength training. Aerobics, and Jazzercise classes
Availability/hrs.	Call for schedule
Supervision	Instructor led classes. Certified Tai Chi instructor
Cost	Fees range from free to \$3.00 per class
Accessibility	Fully accessible. Must be able to stand to fully participate in Tai Chi
Other	People over 55 years of age. Class size limited to 25

## Parks and Recreation Senior Programs

<b>Burlington Parks and Recreation</b>	
Contact	Justin Lippe
Address	645 Pine Street Suite B, Burlington, VT 05401 www.enjoyburlington.com
Phone Number	(802) 864-7091
Description	Senior Adult Programs - Exercise and strength training classes, Tap dance, Line dancing, Yoga, "Play Days", Green Mountain Senior Games Competition
Availability/hrs.	Call for schedule.
Supervision	Instructor from Burlington Parks and Recreation
Cost	Depends on program
Accessibility	Site dependent
Other	Adults over 55 years of age
<b>Colchester Parks and Recreation</b>	
Contact	Derek Mitchell
Address	P.O. Box 55, Colchester, Vermont 05446 www.town.colchester.vt.us
Phone Number	(803) 655-0811 ext. 3

Description	Variety of seasonal programs such as ice skating (Leddy Park), swimming (St. Michael's Ross Sports Center) and trips are available.
Availability/hrs.	Call for schedule.
Supervision	Each facility has own staff. Walking and skating have parks and rec staff involved
Cost	Varies by program
Accessibility	Site dependent
Other	Call for further information. Many activities can include the whole family
<b>South Burlington Recreation Department</b>	
Contact	Tom Hubbard
Address	575 Dorset Street, So. Burlington, Vermont 05403
Phone Number	(802) 866-4108
Description	Light Jazzercise. Meets in the large conference room in the City Office Building on Dorset Street. South Burlington Senior Club (September – June).
Availability/hrs.	Monday, Wednesday, and Friday ongoing
Supervision	Qualified instructor
Cost	Punch pass available - Call for details.
<b>Williston Recreation Department</b>	
Contact	Kevin Finnegan, Director
Address	7900 Williston Road, Williston, VT 05495
Phone Number	(802) 878-1239
Description	Variety of programs such as aerobics, indoor walking, computer classes, craft classes, ballroom dancing, golf and more!
Availability/hrs.	Call for a program guide
Supervision	Varies with program
Cost	Varies with program
Accessibility	Site dependent

## Community Recreation Paths

For many lucky older adults, recreation paths are readily available. Burlington, Colchester, Essex/Essex Jct., Milton, South Burlington and Williston all have beautiful, well-maintained paths. You can walk, run, wheel, roller blade or bike safely away from the hazards of automobile traffic.

Here are a few tips to make this a safe and enjoyable venture:

- Always walk with a human companion. All dogs are not Lassie and a friend could be invaluable if a problem occurred while you were out. Let someone know where you are going and when to expect you back.
- Dress appropriately for the activity - proper footwear, weather appropriate clothing, appropriate protective equipment - helmet, padding, etc.
- Bring a flashlight if it may get dark while you are out.
- Bring a filled water bottle.
- Don't wear headphones that prevent you from hearing what is going on around you.
- Don't bring valuables with you.
- Carry identification with you.

## Long Term Care Facility Programs

All Long Term Care Facilities have fitness programs for their residents. Formal programs with physical, occupational and speech-language therapies are provided as indicated. Most offer a chair exercise program, bowling, stretching and other programs through their Recreation Therapy Programs.

## Health Focused Programs

Arthritis Foundation Aquatic Program	
Contact	Arthritis Foundation Northern New England Chapter
Address	257 So. Union Street, Burlington, Vermont 05401
Phone Number	(802) 864-4988
Description	Warm water, recreational exercise program designed to safely keep joints moving. May help decrease pain and stiffness, maintain flexibility, no swimming skills needed.
Availability/hrs.	Offered by various local health clubs and facilities.

Supervision	Classes led by staff trained to facilitate this arthritis program.
Cost	Program fees vary and are set by each facility
Accessibility	Sites offering the program are accessible
Other	The Arthritis Foundation offers a variety of land and water exercise videotapes for people with arthritis. Prices range from \$19.50 - \$30. A list of videos is available from the Foundation Videos (for purchase or to borrow).
<b>Cardiac Rehab Program</b>	
Contact	Laura Howland
Address	62 Tilley Drive, S. Burlington, VT 05403
Phone Number	(802) 656-4514
Description	Exercise/Prevention Program for heart patients, doctor referral – Research program for older heart patients
Availability/hrs.	Monday – Friday, 8:00 am – 6:00 pm
Supervision	Physician/Nurse
Cost	Variable, Health Insurance may cover
Accessibility	Elevator, walk from parking
<b>Diabetes Exercise Class</b>	
Contact	Kevin Hatin
Address	YMCA, 266 College Street, Burlington, Vermont 05401
Phone Number	(802) 862-9622
Description	Low-impact aerobics or Aqua aerobics
Availability/hrs.	Scheduled 12 week sessions. Call for information and to register
Supervision	Monitored by medical personnel. Must be physician referred
Cost	First 12 weeks free – Sponsored by Fletcher Allen Health Care Community Health Improvement
Accessibility	Parking on the street. Wheelchair accessible
Other	Must have diabetes. Must be physician referred. Must preregister. Celebration lunch with Nutrition Workshop by registered dietitian at conclusion of sessions.

## COMMUNITY BASED PROGRAMS

Get Moving Champlain Valley	
Contact	Jaime Gagnon
Address	c/o United Way of Chittenden Cty., 95 St. Paul St., Ste. 210 Burlington, VT 05401
Phone Number	(802) 864-7541 x15
Description	“Get Moving” is an initiative of the Champlain Initiative . This physical activity incentive program is to encourage individuals of all ages and abilities to be physically active. You choose type of fitness program and keep a record for each 30 minute block of activity in a log.
Availability/hrs.	Call for a current calendar of activities available, all free or low cost. They vary from walking and swimming to aerobics. You can choose any activity you wish.
Supervision	This is a self monitored program. Consult your health care provider before beginning any new physical activity.
Cost	Most are free - see quarterly activity calendar available through The Champlain Initiative.
Accessibility	Depends on location - call ahead if there are concerns
Other	You will receive a recognition certificate signed by the Governor and be eligible for quarterly prize drawings and t-shirts upon completed log.
The Governor’s Walking Challenge	
Contact	Jill Nye-McKeown
Address	Vt. Dept. of Health, Health Promotion, P.O. Box 70, Burlington, VT 05402
Phone Number	(802) 651-1869 or (800) 464-4343
Description	Goal is to recognize individuals who walk for exercise at three levels: 50, 100 and 500 miles. Also, to encourage Vermonters to get 30 minutes of physical activity every day. Walking is done independently and recorded.
Availability/Hrs.	Ongoing program
Supervision	No supervision. Consult your health care provider before beginning any new physical activity.
Cost	Free
Accessibility	Up to participant. Walk anywhere you choose three times per

	week for at least 20-30 minutes. See Mall Walking Program.
Other	Call to get a log sheet to keep track of your mileage. Detailed information about awards and participation are included.
<b>Mall Walking – General</b>	
Description	Walk in climate controlled environment
Availability/hrs.	Check mall hours – some open early before regular store ours
Supervision	No supervision. Consult your health care providers before beginning any new physical activity.
Cost	Free except for parking fees when necessary
Accessibility	Parking in garage, in mall parking lots and on the street. Plan on a walk to get there and back
Other	Dress for more moderate temperatures indoors and wear appropriate footwear
<b>University Mall Walkers</b>	
Contact	Geri-Ann Higgins
Address	University Mall, South Burlington, Vermont 05403
Phone Number	(802) 863-1066
Description	Walk in a safe and climate controlled environment and safety
Availability/hrs.	Monday – Saturday (5 a.m. to 9:30 p.m.), Sunday (7 a.m. - 6:00 p.m.) Open before regular store hours to decrease congestion
Supervision	No supervision. Consult you health care providers before beginning any new physical activity
Cost	Free – arn rewards when you sign up at customer service desk
Accessibility	Accessible. Ample parking, but plan for a walk to and from car.
Other	Dress for more moderate temperatures indoors and wear appropriate footwear

## Fundraisers

<b>Alzheimer’s Association VT &amp; NH Chapter</b>	
Contact	Gail Deuso
Address	P.O. Box 1139, 338 River Street, Montpelier, VT 05601
Phone Number	1-800-698-1022
Description	Consider participating in one of the many walking fundraisers that occur throughout the month. “Chittenden County Memory

	Walk and service organization. Help Line provides support to patients and families 1-800-536-8864.
Availability/hrs.	Saturday October 2, 2004 Register at University Mall 9 a.m., Walk starts 10 a.m.
Other	Fundraiser for the Vermont Chapter of the Alzheimer's Association
American Diabetes Association - Vermont Affiliate	
Contact	Phil Forsyth
Address	77 Hegeman Avenue, Colchester, Vermont 05446
Phone Number	(802) 654-7716
Description	America's Walk for Diabetes – call for more information. Six locations: Burlington, Middlebury, Newport, Rutland, Montpelier, Brattleboro
Availability/hrs.	Call for more details
Other	Fundraiser for the American Diabetes Association. Proceeds support diabetes research, education and advocacy.
American Heart Association – Vermont Affiliate	
Contact	Becky Cook
Address	434 Hurricane Lane, P.O. Box 485, Williston, Vermont 05945
Phone Number	(802) 288-8306
Description	American Heart Walk - 3 mile walk
Availability/hrs.	May - call for more information
Other	Fundraiser for the American Heart Association
Committee on Temporary Shelter (COTS)	
Contact	Sally Ballin
Address	P.O. Box 1616, Burlington, Vermont 05401 Cotsonline.org
Phone Number	(802) 864-7402
Description	Cots Walk - Call for details. Burlington location - tour shelters
Availability/hrs.	May 1 <sup>st</sup> , Battery Park

# Transportation

## **I'd love to exercise but I don't have a car. How can I get there???**

Transportation is often a barrier to participating in fitness activities. Special Services Transportation Agency (SSTA) has a variety of service options for those who need a ride to a recreation site or fitness program. Both individuals and groups can be accommodated. Persons with wheelchairs can use the lift equipped vans to get to their destinations.

**Call for more information about the services available from SSTA at (802) 655-7880.**

### Pedometer Program\*

1. Find the best location for your pedometer.
  - This may your belt or pants waistband, directly above your knee or it may be above your hip.
  - Set your pedometer to zero and take 50 steps.
  - If the pedometer shows 50 steps, it is in the right place. If not, adjust it and do the 50 steps again.
  - Once you find the correct location, wear it in the same place each day.
  - Pedometers do not work correctly if attached to your shoe.
2. Be sure your pedometer is attached firmly at all times; if it is tilted or flops around, it may miscount steps. Wear your pedometer all day, from when you get dressed in the morning until you go to bed at night.
3. Do not wear your pedometer when you are showering, taking a bath, or swimming.
4. Pedometers do not work with “non-weight bearing activities” such as bicycling or swimming. See “Pedometer Conversions” to see how to count these activities.
5. Write your daily steps on the tracking sheet each day.
6. Remember to set your pedometer to zero each day.

\*Adapted from Vermont Department of Health (2008c). Get Moving Vermont. Located at <http://www.healthvermont.gov> Accessed December 2007.

### Pedometer Conversions\*

1. Multiply the number of minutes you did the activity by the number of steps indicated on the chart. For example, 30 minutes of mopping equals 3030 steps (30 minutes x 101).
2. If your activity is not listed below, find the one(s) most similar to it on the list and estimate the activity's step value.
3. You can also estimate steps by knowing that 2,000 steps equals 1 mile.
4. Remove your pedometer when choosing an activity other than walking, but do not reset your pedometer to zero.
5. Use the step conversion chart to calculate your steps during a “non-walking” activity and add those steps to the total number on your pedometer at the end of the day.
6. If you keep track of miles or time, not steps, you can convert your miles to steps by using the following formula:
  - Walking or pushing a wheelchair at a moderate pace: 1 mile in 20 minutes = 2,000 steps
  - Jogging or running: 1 mile = approximately 4,000 steps
  - Swimming: 1 mile = approximately 4,000 steps
  - Cycling: 3 miles = approximately 2,000 steps

\*Adapted from Vermont Department of Health (2008c). Get Moving Vermont. Located at <http://www.healthvermont.gov> Accessed December 2007.

Number of steps per minute for selected activities			
Aerobics, high impact	203	Orienteering	260
Aerobics, low impact	145	Painting	131
Aerobics, step	246	Pilates	101
Badminton, casual	131	Ping pong	116
Badminton, competitive	203	Racquetball, casual	203
Basketball, game	230	Racquetball, competitive	290
Basketball, recreational	174	Raking leaves	125
Bicycling, leisurely	116	Roller skating	203
Bicycling, stationary	203	Rowing, light	101
Bowling	87	Rowing, moderate	203
Boxing	348	Running, 10 mph (6 min/mile)	463
Canoeing, light	87	Running, 8 mph (7.5 min mile)	391
Chopping wood, around home	174	Running, 6 mph (10 min mile)	290
Circuit Training	232	Running, 5 mph (12 min/mile)	232
Cross-country skiing, intense	260	Scuba diving	203
Cross-country skiing, moderate	232	Show shoveling	174
Cross-country skiing, slow	203	Snowboarding, light	150
Dancing	131	Snowboarding, moderate	182
Downhill skiing	174	Soccer, recreational	203
Elliptical trainer	203	Soccer, competitive	290
Firewood, carrying	145	Softball	145
Firewood, sawing with handsaw	217	Squash	348
Firewood, stacking	145	Stair climbing, machine	260
Football	260	Stair climbing, moderate	334
Gardening, light	116	Stair climbing, slow	232
Gardening, heavy	174	Stair climbing, vigorous	434
Gardening, weeding	131	Stretching	72
Golfing, without a cart	131	Swimming, backstroke	203
Golfing, with a cart	101	Swimming, breaststroke	290
Grocery Shopping	67	Swimming, butterfly	319
Handball	348	Swimming, freestyle	203
Hiking, 10-20 lb. load	217	Swimming, leisure	174
Hiking, 21-42 lb. load	232	Swimming, treading water	116
Hiking, general	172	Tae Kwon Do	290

Horseback riding	116	Tai Chi	116
Horseback riding, trotting	188	Tennis, doubles	174
Housework, light	72	Tennis, singles	232
Housework, mopping floors	101	Trampoline	101
Housework, scrubbing the floor	110	Volleyball, game	232
Housework, vacuuming	101	Volleyball, leisure	87
Housework, washing windows	87	Wash the car	87
Ice skating	203	Water aerobics	116
Judo	290	Water skiing	174
Jumping rope, fast	348	Wax the car	131
Jumping rope, moderate	290	Weight lifting, moderate	87
Karate	290	Weight lifting, vigorous	174
Kickboxing	290	Yard Work	145
Mowing	160	Yoga	72

\*Adapted from Vermont Department of Health (2008c). Get Moving Vermont. Located at <http://www.healthvermont.gov> Accessed December 2007.

APPENDIX L:  
PROJECT I'M POSSIBLE SESSION 2 MATERIALS

## The Possible Selves Questionnaire\*

### Adapted to the Physical Activity Domain\*\*

1. Write down all your possible selves, regardless of domain (e.g. personal, professional, social, health).
2. Identify from the list the possible self that you consider to be the most important.
3. Answer the following questions in reference to this most-important possible self. The number 1 represents not at all capable/likely and 7 represents very capable/likely.
  - a. How important is it to you to achieve this possible self?  
1 2 3 4 5 6 7
  - b. How capable do you feel of accomplishing your possible self?  
1 2 3 4 5 6 7
  - c. How likely do you think it is for your possible self to come true?  
1 2 3 4 5 6 7
4. Choose the possible self from the original list that is most closely associated with your current level of physical activity.
5. Answer the same questions in reference to this possible self using the same scale.
  - a. How important is it to you to achieve this possible self?  
1 2 3 4 5 6 7
  - b. How capable do you feel of accomplishing your possible self?  
1 2 3 4 5 6 7
  - c. How likely do you think it is for your possible self to come true?  
1 2 3 4 5 6 7

\*From Cross, S. & Markus, H. (1991). Possible selves across the life span. *Human Development*, 34, 230-255, & Whaley, D. E. (2003).

\*\*Future-oriented self-perceptions and exercise behavior in middle-aged women. *Journal of Aging & Physical Activity*, 11.

### Goal Setting\*

- Make short and long term goals. Decide how long it will take to reach your goal. Try to increase by 10% each week.
- Set challenging but realistic goals, ones you can stick with over time.
- Set a date to reach your goals. Consider setting a three month and six month goal.
- Write down your goals and post them where you can review them regularly.
- Share your goals with others. Telling others can help you stick to your goals.
- Celebrate successes--just don't celebrate by stopping physical activity!
- Set new goals when you have accomplished your original ones.

\*Adapted from Vermont Department of Health (2008c). Get Moving Vermont. Located at <http://www.healthvermont.gov/family/move/index.aspx> Accessed July 2008.

## Goal Setting Worksheet\*

Current level of activity

Activity type(s) (include household and leisure-time activities):

\_\_\_\_\_

Number of accumulated minutes per day: \_\_\_\_\_

Number of days per week: \_\_\_\_\_

Short term goal

Activity type(s): \_\_\_\_\_

Increase by \_\_\_\_\_ number of accumulated minutes per day

(suggested: 10% increase per week)

Increase by \_\_\_\_\_ number of days per week (suggested: 10% increase per week)

Long term goal

Activity type(s): \_\_\_\_\_

Number of accumulated minutes per day \_\_\_\_\_

Number of days per week \_\_\_\_\_

\*Adapted from Vermont Department of Health (2008c). Get Moving Vermont. Located at <http://www.healthvermont.gov/family/move/index.aspx> Accessed July 2008.

APPENDIX M:  
STUDY EVALUATION FORMS

Motivating Physical Activity in Older Women Study  
Study Evaluation Form (Intervention Group)

Date	Session	Title
	1	Orientation
	2	Imaging
	3	Expectations and Beliefs
	4	Experimenting
	5	Experimenting
	6	Assessment of Outcomes
	7	Identity Consolidation
	8	Identity Evaluation

1. Were there sessions during which you had little to contribute or to say?  
Yes      No      If so, which session(s) and why? \_\_\_\_\_  
\_\_\_\_\_
  
2. Did you have a favorite session?      Yes      No  
If so, which one and why? \_\_\_\_\_
  
3. Were there sessions that you felt weren't needed? Yes      No  
If yes, which one(s) and why? \_\_\_\_\_
  
4. Please rate your satisfaction with the following, with 1 being the lowest and 5 being the highest.
  - a. Group facilitation:      1      2      3      4      5
  - b. Location:      1      2      3      4      5
  - c. Materials:      1      2      3      4      5
  
5. Is there anything else you would like to share about your experience in this study? Please use the back of this sheet for your answer.

**Motivating Physical Activity in Older Women Study  
Study Evaluation Form (Attention-control Group)**

Date	Session	Title
	1	Orientation
	2	Breast and Cervical Cancer Screening
	3	Planning for Healthy Eating
	4	Diets for Diabetes Prevention
	5	Medicare Part D
	6	Falls Prevention
	7	Cardiovascular Disease Prevention
	8	Vaccines for Older Adults

1. Were there sessions during which you had little to contribute or to say?  
Yes      No      If so, which session(s) and why? \_\_\_\_\_  
\_\_\_\_\_
  
2. Did you have a favorite session?      Yes      No  
If so, which one and why? \_\_\_\_\_
  
3. Were there sessions that you felt weren't needed? Yes      No  
If yes, which one(s) and why? \_\_\_\_\_
  
4. Please rate your satisfaction with the following, with 1 being the lowest and 5 being the highest.
 

a. Group facilitation:	1	2	3	4	5
b. Location:	1	2	3	4	5
c. Materials:	1	2	3	4	5
  
5. Is there anything else you would like to share about your experience in this study? Please use the back of this sheet for your answer.

APPENDIX N:  
LIST OF ATTENTION-CONTROL GROUP  
SMALL GROUP DISCUSSION TOPICS

ATTENTION CONTROL GROUP 1		
SESSION	TOPIC	SPEAKER
2	Breast and Cervical Cancer Screening Recommendations	Julie Wasserman RN, VDH Director of Women's Health
3	Planning for Healthy Eating	Mary Woodruff RD, State of Vermont Division of Aging and Independent Living
4	Diets for DM prevention	Robin Edelman RD, Certified Diabetic Educator, VDH Diabetes Prevention Program
5	Medicare Part D: What You Need to Know	Patricia Selsky, State Health Insurance Program Coordinator
6	Falls Prevention	Diane Wheaton RN, Fletcher Allen Health Care, Falls Prevention Program
7	Cardiovascular Disease Prevention	Sioban Donnegan RD, VDH Wisewoman Registered Dietician
8	Vaccine Recommendations for Older Adults	Ann Giombetti RN, VDH Public Health Nurse
ATTENTION CONTROL GROUP 2		
2	Safe Medication Disposal	Marie Di Benedetto, Group facilitator
3	Breast and Cervical Cancer Screening Recommendations	Tanya Beaudoin, Health Outreach Specialist, Ladies First Program, VDH
4	Falls Prevention	Dawn Weening, RN, Falls Prevention Program, Fletcher Allen Healthcare
5	Nutrition for Older Adults	Marcia Bristow, RD, University of Vermont Dietetics Program
6	Vaccines for Older Adults	Ann Giombetti RN, Public Health Nurse, VDH
7	Plan for Healthy Eating	Mary Woodruff RD, Division of Disabilities, Aging, and Independent Living, State of Vermont
8	Nutrition for Cardiovascular Disease	Siobhan Donnegan RN, Wisewoman Program, VDH

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