

**THE DEVELOPMENT AND VALIDATION OF A MEASURE TO ASSESS  
DESIRE FOR PHYSICAL COMPETENCE**

By

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## **DEDICATION**

This thesis is dedicated to my loving family, Elaine and Way, Peter and Joan, and Darren and Kat. Thank-you for giving me the guidance and support to know that with hard work and commitment anything is possible.

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## TABLE OF CONTENTS

DEDICATION .....	ii
ACKNOWLEDGEMENTS .....	iii
TABLE OF CONTENTS .....	iv
LIST OF TABLES AND FIGURES .....	vii
ABSTRACT .....	viii
INTRODUCTION AND REVIEW OF LITERATURE .....	1
Importance of Physical Function .....	1
Aging .....	1
Disablement in America .....	2
Disablement .....	3
Components of Disability .....	4
Active Pathology: Selective Chronic Diseases .....	4
Impairments .....	8
Sarcopenia .....	9
Balance .....	11
Cardiovascular Function .....	12
Social Cognitive Theory and the Disablement Process .....	13
Self-efficacy .....	14
Physical symptoms .....	15
Social influence .....	16
Incentives .....	17

METHODS .....	19
Item and Scale Development .....	19
Factor Structure and Construct Validity .....	20
Participants.....	21
Measures .....	21
Demographics. ....	21
SF-36.....	21
Social Desirability.....	22
Desire for Control. ....	22
Body Satisfaction. ....	22
Life Satisfaction. ....	23
Procedures.....	23
Statistical Analyses .....	24
Test Retest Reliability.....	24
Participants.....	24
Measures .....	24
Procedures.....	25
Statistical Analyses .....	25
RESULTS .....	26
Participant Demographics.....	26
Dimension Structure of the Desire for Physical Competence Scale (DPC) .....	28
Descriptive Statistics for the DPC and Subgroup Comparisons.....	29
Construct Validity.....	32

Test – Retest Reliability.....	33
DISCUSSION.....	34
Future Research and Limitations.....	36
Clinical and Public Health Implications.....	37
APPENDIX A.....	39
APPENDIX B.....	41
APPENDIX C.....	42
APPENDIX D.....	44
APPENDIX E.....	50
APPENDIX F.....	52
APPENDIX G.....	54
APPENDIX H.....	55
APPENDIX I.....	56
APPENDIX J.....	57
REFERENCE LIST.....	61
CURRICULUM VITAE.....	70

## LIST OF TABLES AND FIGURES

Figure 1: Model of Physical Disability .....	3
Table 1: Descriptive Data on All the Participants .....	26
Table 2: Dimension Structure of the Desire for Physical Competence Scale.....	29
Table 3: Demographic Variables on Subgroups .....	31
Table 4: Correlational Analyses.....	33
Table 5: Test-Retest Reliability .....	33

## ABSTRACT

### THE DEVELOPMENT AND VALIDATION OF A MEASURE TO ASSESS DESIRE FOR PHYSICAL COMPETENCE

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This thesis is under the direction of W. Jack Rejeski, Ph.D., Professor of Health and Exercise Science.

The purpose of the present study was to develop and validate a measure to assess desire for physical competence. From an initial pool of 46 items, 25 were selected through exploratory principle component analysis and by evaluating each item for clarity, simplicity, and content validity. One hundred and fifty-seven adults over the age of 60 (men = 53; women = 104) completed the desire for physical competence (DPC) scale as well as six other questionnaires. Results revealed that the 25 items could be reduced to two 8-item subscales: basic (DPC-B) and advanced (DPC-A). The two factors explained 70.67% of the total variance in these items. The Chronbach Alpha Internal Consistency Reliabilities of these two scales was excellent, 0.94 and 0.92, respectively. In examining the two subscales, the mean ( $\pm$  SD) for the DPC-B was 3.26 ( $\pm$  0.85), for the DPC-A was 2.13 ( $\pm$  1.05). Scores for both subscales had a possible range of 0-4. The difference between the DPC-B and DPC-A was statistically significant,  $t_{(156)} = 16.67$ ,  $p < 0.001$ , with older adults scoring higher on the basic than the advanced DPC scale.

Inspection of these results reveals that although the two subscales of the DPC are correlated with one another ( $r = 0.62$ ), there is also a substantial amount of unique variance in each subscale. Neither subscale of the DPC was influenced by social desirability ( $p < 0.05$ ), providing important evidence for the discriminant validity of the

two scales. Individuals who scored high on the DPC-A had higher scores on the physical health scale of the SF-36, had higher general desire for control, and more favorable body satisfaction than individuals scoring lower on the DPC-A. In contrast, the DPC-B subscale was positively correlated with only the SF-36; moreover, the relationship with the SF-36 was substantially lower ( $r = 0.23$ ) for the DPC-B than for the DPC-A ( $r = 0.42$ ). Neither the DPC-A nor the DPC-B were related to overall life satisfaction; however, life satisfaction was related to body satisfaction ( $r = 0.46$ ), desire for control ( $r = 0.20$ ), social desirability ( $r = 0.19$ ), and the SF-36 ( $r = 0.24$ ). The test-retest reliability coefficients for the DPC-B and DPC-A were excellent,  $r = 0.93$  and  $r = 0.93$ , respectively.

This study provides initial evidence that the DPC (basic and advanced) is both a valid and reliable measure to assess desire for physical competence. Further research is needed on the construct validity of the measure and exploring the utility of this measure as a means to better understand the disablement process.

## **INTRODUCTION AND REVIEW OF LITERATURE**

Declining physical function in the elderly contributes to a loss of independence and places a burden on the individual and on society. Health care professionals recognize that a number of physiological, psychological, and sociological factors contribute to functional decline. The current study was designed to develop and validate a measure of the desire for physical competence in older adults. Whereas the motive to be physically competent may facilitate the maintenance of functional abilities, no measure is currently available to assess this construct. The review of literature that follows examines the following topics:

- The Importance of Physical Function
- Disablement in America
- Components of Disability

### **Importance of Physical Function**

#### Aging

The number of older adults in the 65+ year-old segment of the population has steadily increased over the past decade. Recently, this growth has become a major public health concern. According to the US census reports of 1999, people of both sexes are living longer. In less than 100 years, life expectancy for men has grown from 47.2 years to 72.5 years; the life expectancy for women has increased even more (from 49.4 years to 78.9 years) (National Vital Statistics Report, 2003). According to Census Bureau's projections (2000), the population over the age of 60 will double between 2002 and 2050, to an estimated 80 million people.

The majority of the growth will occur between 2010 and 2030, with the maturing of the baby boom generation. The large increase in the birth rate after World War II has resulted in an unbalanced population makeup. The overwhelming number of baby boomers who will be in need of residential care later in life is expected to stress assisted living facilities. In addition to the aging baby boom population, advancements in medical interventions continue to increase life expectancy.

Originally, improved sanitation and the pharmacological treatment of parasitic diseases were believed to be responsible for the observed gains in life expectancy. Recently, however, the medical management of chronic diseases has become a major factor in the increased life span. Despite the fact that morbidity with these chronic diseases has decreased, their incidence is still prevalent among the US population. Approximately 89% of the population has at least one of the five risk factors (physical inactivity, smoking, overweight, high cholesterol, or more than moderate drinking) for chronic disease; almost 20% have three or more (National Academy on a aging society, 2000).

### **Disablement in America**

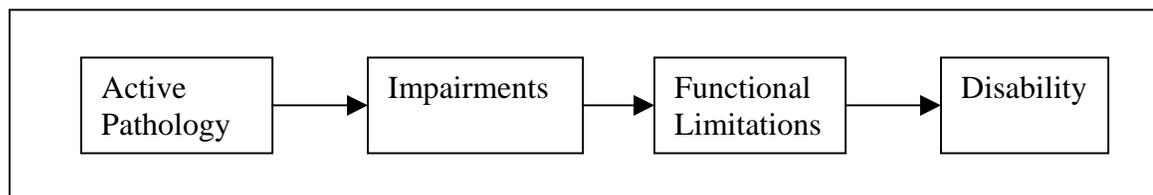
With the exponential increase in the aging population, one would expect health care to become sensitive to the problems of physical limitation and disability. Functional limitations have been defined as a difficulty in performing daily tasks that result from disuse, aging, or disease (Carlson et al., 1999) and can lead to disabilities. Disability associated with aging has been defined as the inability to complete daily tasks or activities in a social/physical environment (Carlson et al., 1999; Ostir et al., 1999). Both

functional limitation and disability place an increased financial and emotional burden on the individual and on society. This burden is partially due to the risk of falling, dependency, and hospitalization (Fried & Guralnik, 1997).

The financial burden on the individual can vary tremendously. For example, in Forsyth County, North Carolina, assisted living facilities range from \$21,912 to \$36,576 per year, depending on the degree of care necessary. The typical American should anticipate a longer life expectancy, which may result in longer periods of physical disability. Physical disabilities often lead to the need for residing in assisted living facilities.

### Disablement

To be able to explain the development of disabilities, Nagi (1965) proposed a model with four sequential stages: active pathology, impairments, functional limitations, and disability (Figure 1).



**Figure 1: Model of Physical Disability (Nagi, 1965)**

Since several internal and external factors can either expedite or slow down the process, Verbrugge and Jette (1994) created the *disablement process model*. This model recognizes that risk factors predispose individuals to certain active pathology. There are both individual adaptations in response to disablement and external processes (drugs and exercise therapy), which can alter this process. The model starts with an interruption within an organism, causing an abnormality (anatomically, physiologically, or mentally)

and limiting performance of a specific task. Eventually, the limitation affects the individual in a social/physical setting.

Researchers studying the association between functional limitations and health behaviors have found that a lack of exercise is strongly associated with decreased physical function (LaCroix, Guralnik, Berkman, Wallace, & Satterfield, 1993); Simonsick et al., 1993; Mor et al., 1989; Clark, 1996). Certainly several other predictors of functional decline need to be considered such as obesity and nutrition. Fortunately, several of these predictors are alterable health behaviors (Fried et al., 1997). In the following sections, the role of active pathology, impairments, and social cognitive theory in the disablement process will be addressed.

## **Components of Disability**

### Active Pathology: Selective Chronic Diseases

There are many chronic diseases that can affect the active pathology component of Nagi's Model of Physical Disability. The following section will address the three most common chronic diseases that have the greatest impact on physical impairments and disability in individuals over the age of 65. These three diseases, cardiovascular disease, chronic obstructive pulmonary disease, and osteoarthritis, can account for approximately 64% of the physically impaired population in America (National Academy on a aging society, 2000).

Cardiovascular disease (CVD) is the number one chronic disease, affecting over 75% of the US population over the age of 65 years (Ghali, Cooper, & Ford, 1990). This incidence will continue to rise due to poor nutrition choices and lack of physical activity.

The prevalence of CVD is high as well and will continue to increase because fewer people are dying as a result of CVD. Advances in medical interventions and treatments have played a significant role in the survival of myocardial infarctions and arteriosclerosis. Unfortunately, the high rates of recurrent coronary events and resulting disease in older adults inflate the individual and societal burden of this disease (Aggarwal & Ades, 2001). With respects to CVD and it's effects on physical function, healthy older adults have a decreased exercise capacity associated with increasing age. Most of the negative factors contributing to decreased exercise capacity are magnified when established CVD (such as left ventricular hypertrophy, reduced cardiac output, and stroke volume) is present. Aging is associated with a reduced responsiveness to  $\beta$ -adrenergic stimulation (Lakatta, 1986). This desensitivity results in an inability to increase heart rate and contractility in response to stress and peripheral vasodilation. Additionally, aging increases vascular stiffness, resulting in an impedance to left ventricular ejection fraction (Rich, 1997). In general, these age-related changes in diastolic filling have clinical implications, such as the inability to pump necessary amounts of blood to the body and an increase in ectopic beats. Both of these impairments increase the fall risk for individuals` (Rich, 1997).

Another problem that has a significant effect on physical function (and is in part caused by CVD) is congestive heart failure (CHF). With CHF, an accumulation of fluid builds in the body – especially the heart and lungs – because of inefficient pumping of the heart. CHF and CVD limit physical function. Both diseases leave the individual feeling drained of energy and often depressed. A continuous cycle begins to develop: a lack of energy causes the individual to participate in less activity, atrophy begins and the heart

becomes even more inefficient, which decreases the ejection of blood out of the heart, further depressing energy levels (Rich, 1997).

Not only do physiological effects take place within the heart muscle, but CVD also causes problems with the lungs and the central nervous system (Clark, Rafferty, & Arbuthnott, 1997). The changes in respiratory function diminish respiratory reserve, producing hypoxemia and pulmonary hypertension. These changes have a detrimental effect for everyone, but especially for one with a failing heart. However, better physical function, as well as a life with fewer and less severe symptoms, is an important benefit for older adults in their efforts to maintain independence and manage heart disease (Clark et al., 1997).

The second chronic disease to be examined is chronic obstructive pulmonary disease (COPD). COPD is the fourth leading cause of morbidity and mortality in the US population (Webster & Kadah, 1991; Anto, Vermeire, Vestbo, & Sunyer, 2001). COPD causes extensive disability, primarily among the elderly, due to limited airflow. Though the leading cause of COPD is smoking, other factors (such as frequent lung infections and exposure to certain industrial pollutants) play a significant role in the development of this disease. COPD has been cited as a classic “geriatric disease,” since age is a significant risk factor in the development of this disease (Webster et al., 1991). The American Thoracic Society has defined COPD as a “disease state characterized by the presence of airflow obstruction due to chronic bronchitis or emphysema; the airflow obstruction is generally progressive, may be accompanied by airways hyperreactivity and may be partially reversible.”

There are two strong predictors of death due to COPD that have been examined: age and forced expiratory volume in one second (FEV<sub>1</sub>) (Anto et al., 2001; Anthonisen, Wright, & Hodgkin, 1986; Webster et al., 1991; Feenstra, van Genugten, Hoogenveen, Wouters, & Rutten-van Molken, 2001). The decrease in FEV<sub>1</sub> is a contentious issue, since it is difficult to determine when exactly the symptoms appear. Once an individual's FEV<sub>1</sub> is less than 49% of the predicted value, substantial impairment occurs in his or her quality of life (Anto et al., 2001). This impairment first appears as shortness of breath (SOB) during strenuous exercise. It soon starts to affect the individual during his or her activities of daily living. By this point, the individual opts to discontinue the activity or activities responsible for his or her SOB. When COPD is already established, appropriate treatment and medical interventions are the only options available to slow progression and reduce disability. Fortunately, pulmonary rehabilitation significantly reduces disability (Anto et al., 2001; Webster et al., 1991), but it requires the individual to exert him or herself to the point of his or her symptoms. Generally, patients do not want to work to this point because it is uncomfortable. Patients with COPD should focus not only on prolonging survival, but also on maintaining and improving activities of daily living (Webster et al., 1991). The impaired ability to provide oxygen to the working muscles makes the individual feel fatigued and weak, though it has been seen that exercise will help to maintain the individual's current function. In the long run, physical activity will help to maintain his or her physical function.

Physical function can also be limited by osteoarthritis (OA). OA is another significant cause of disability for middle-aged and older adults. Millions of adults suffer from mild to moderate disability, though some experience severe disability resulting from

OA (Verbrugge & Juarez, 2001). The symptoms of OA lead to physical limitations that many adults endure on a daily basis. For example, OA causes pain, limited motion, deformity, and difficulties in accomplishing daily tasks (Verbrugge, 1990). Sufferers unable to walk without pain or to bend over are those that eventually endure disability. This significant loss in function is the reason why early detection is needed. Research has indicated that various forms of arthritis can be ameliorated by early medical care, appropriate treatment, and weight control (Vradenburg, Simoes, Jackson-Thompson, & Murayi, 2002; Felson, Zhang, Anthony, Naimark, & Anderson, 1992). A physical limitation due to symptoms is positively associated with poor physical health from the previous year. Therefore, to decrease symptoms, proper health maintenance and increased physical activities are a must.

In summary, chronic conditions, including OA, COPD, and CVD, act as an interruption of the body's normal homeostasis. According to Nagi's model, this disruption leads to impairments within various body systems. Then lead to physical limitations and ultimately to disability.

### Impairments

In an aging individual, there are a variety of physiological changes that can adversely affect physical function. Disability could be the end result of such impairments as muscle loss and deficits in balance (Bootsma-van der Wiel et al., 2002). Through research, scientists have established some of the determinants of muscle loss (sarcopenia) such as coronary heart disease. Increased problems with balance and muscle loss have been linked to several functional and psychological impairments or abnormalities

(Bootsma-van der Wiel et al., 2002; Melton, III et al., 2000). All of the above mentioned have been linked to the decline of lower extremity physical function.

Sarcopenia. Sarcopenia, also known as age-related muscle loss, has been defined as a decrease greater than 2 standard deviations in muscle mass from young adult norms (Melton, III et al., 2000). Although sarcopenia is associated with normal aging, it is accelerated by physical inactivity. The etiology has not been clearly identified, but several important factors are thought to contribute to the increased rate of muscle loss. Some of these factors include: (i) a decrease in motor neurons (decrease in central nervous system); (ii) a decrease in growth hormone and other anabolic hormones; (iii) changes in muscle composition, and (iv) an increase in fat mass and inactivity (Roubenoff, 2000).

The loss of alpha motor units from the central nervous system (CNS) is an important feature of sarcopenia. Motor units are lost throughout one's lifespan, but older adults have larger motor units in comparison to younger adults; therefore, when the motor unit drops out, the compensation is not as efficient and results in the loss of muscle contractility/force (Roubenoff, 2000). Exercise training may cause an increase in neuronal firing rates, leading to the possibility of improving the recruitment of motor units and the innervations over time (Akima et al., 1999).

As one ages, changes in anabolic hormones, such as growth hormone, testosterone, and estrogen are thought to alter muscle mass and function promoting muscle atrophy/sarcopenia. There is evidence of decreased lean muscle mass and increased fat around menopause, supporting the theory that estrogen could have a supporting role in the maintenance of muscle mass (Poehlman, Toth, & Gardner, 1995). It was originally

thought that growth hormone could act as a coordinating mechanism, driving the loss of muscle mass in the fourth decade of life. However, the relationship between growth hormone and lean mass is highly mystified by fat mass. Thus, it appears that growth hormone does not contribute to the development of sarcopenia (Roubenoff, 2000). On the other hand, there is clear evidence that sarcopenia is exacerbated by inactivity. Unfortunately, even athletes develop sarcopenia, which indicates that it cannot be completely prevented by exercise (Roubenoff, 2000). Nevertheless, the trend in our society is toward a decrease in physical activity within the elderly population, leading to a sedentary lifestyle that promotes sarcopenia and increased obesity.

Another important factor is the intrinsic changes in muscle contractility and muscle cell biology. Several studies have addressed the contractile properties and biochemical makeup of muscle fiber. However, the mechanisms underlying muscle atrophy have not been clarified (Larsson & Moss, 1993); Larsson, Li, Tollback, & Grimby, 1995; Galler, Hilber, & Pette, 1997). Unfortunately, the correlations between cell properties, whole muscle movements, and activities of daily living are unknown.

The make up of muscle fiber permits muscles to adapt to training as one ages. This supports the theory that, at any given age, a muscle can increase in mass and strength with exercise (Roubenoff, 2000; Poehlman et al., 1995). Though sarcopenia is a consequence of aging that can lead to increased disability, the general population is unaware that it can be partially preventable by exercise. We need to present this information to the public in order to prevent an epidemic of sarcopenia-related disability. Bootsma-van der Wiel et al.(2002) found that within the oldest-old population, a positive correlation between inactivity and impairment exists. Inactivity and excessive fat, both of

which can be reduced by doing task-specific activities, have a significant effect on sarcopenia. Encouragement of physical activity may be the critical way to decrease deterioration of muscle loss in the oldest old. The adage ‘use it or lose it’ may be just the way to present an effective preventive or curative intervention to these older adults. This adage applies not only to sarcopenia but also to other physical limitations, such as poor balance.

Balance. Impaired balance in the elderly generally leads to falls. Each year, approximately 30% of the elderly population (aged 65 and older) falls at least once (Wu, 2002). These falls may lead to more serious decline in physical function or even death. Several factors can impair one’s ability to maintain balance: vestibular deficiencies, lack of muscle tone in lower limbs, or peripheral neuropathies. Profound muscle impairments, such as sarcopenia and loss of balance, are prominent features in the elderly population. Decreasing balance is positively correlated with increasing age (Wu, 2002).

Though it is known that age and balance are correlated, the progression is still a controversial issue. It is thought that, as one ages, there are qualitative changes in the contractile material within the muscle. Though several attempts have been made to support this claim (such as normalizing muscle force with the cross-sectional area determined from limb circumference, ultrasounds and computed tomography scans), there is still no solid evidence to verify it (Bassey, Bendall, & Pearson, 1988; Bruce, Newton, & Woledge, 1989). These qualitative changes do not take into account the gradual replacement of muscle cells with connective tissue as reported by Imamura, Ashida, & Ishikawa (1983) and by Larsson & Ramamurthy (2000).

It has been shown that those with decreased muscle mass are more likely to have poor balance and an increased risk of falls (Wu, 2002). The assessment of body sway and displacement of center of mass can be measured using a force platform. The increased sway is where muscle atrophy can be seen as a contributor to the decrease in force. Muscle atrophy cannot be the sole explanation of the loss in force, since the decreases in force are proportionately larger than decreases in fiber size or muscle cross-sectional area (Berg, Dudley, Haggmark, Ohlsen, & Tesch, 1991). Specific tension is related to the number of force-generating cross-bridges, as well as to the force generated per cross-bridge (Berg et al., 1991), which has a significant impact on balance and gait. These changes can be reduced if the muscle is under a certain amount of tension day to day. Progressive strength training will improve gait and activate the antagonist muscles to improve balance. This improvement of muscle activity prevents the increasing rate of falls in the aging population.

During the aging process, skeletal muscle undergoes significant intrinsic changes related to increases in age. Some of these changes are impairments that lead to functional limitations. Cardiovascular function is another impairment that has a considerable effect on the individual's ability to perform certain tasks. Again, a decrease in cardiovascular function increases with age.

Cardiovascular Function. Measured by maximum oxygen consumption ( $VO_2\text{max}$ ), cardiovascular function is an index of an individual's capacity for movement.  $VO_2\text{max}$  is also the principle marker of mortality due to cardiovascular events.  $VO_2\text{max}$  decreases by approximately 0.8% each year, in close correlation to the decrease in muscle mass. This phenomenon is partially related to reduced physical activity and to lack of

intense activity greater than 6 METs. Regular performance of moderate intensity physical activity can maintain  $VO_2\text{max}$  at a level 20 to 35% superior to the mean level in the same age range (Lacour, Kostka, & Bonnefoy, 2002). Other cardiovascular changes seen with aging are prolongation of excitation-contraction and relaxation, increased after load, and increased vascular and myocardial stiffness. As a result of these changes, there is an increased workload on the heart and a depletion of available energy to perform aerobic activities, examples of functional limitations (Douglas & O'Toole, 1992).

Another component of decreased physical activity may be related to the left ventricular ejection fraction (Ogawa et al., 1992). A decrease in the contractility of the heart decreases the ejection fraction leading to the depletion of energy levels to perform aerobic activities. In other words, if an individual has a low ejection fraction, there is a greater likelihood that he or she will have a more sedentary lifestyle. With limited physical activity, changes, such as sarcopenia and decreased balance, take effect. This is a quick descent, leading to increased functional limitations and disabilities. Measures of both physical performance and ADL disability may identify older, low-functioning adults who may benefit from interventions to prevent them from further disablement (Kempen & Ormel, 1998). Whereas the decline in functioning is related to physical impairments, it is also true that psychological factors play a significant role in physical disablement. The following section addresses this latter issue.

#### Social Cognitive Theory and the Disablement Process

To this point, the literature review has focused on active pathology and physical impairments and their influence on functional limitations or disability. Recently, increased attention has been given to the influence of cognition and affect on disablement

(Verbrugge et al., 1994). In view of this research, the final section of this review will be directed toward studies focusing on various components of social cognitive theory and the process of physical disablement.

Self-efficacy. Social cognitive theory attempts to explain why people behave the way that they do. According to this theory there are three major constructs, self-efficacy, incentive, and outcome expectations. Self-efficacy is defined by Bandura (1986) as an individual's assessment of their effectiveness or competency to perform a specific behavior successfully. Self-efficacy, a situation-specific form of control, has been found to be important in understanding a number of different health behaviors (Bandura, 1986). In recent years, research has been extended to the study of physical disablement.

For example, Tinetti, Mendes de Leon, Doucette, and Baker (1994) provided some of the first evidence that control beliefs such as self-efficacy are relevant in understanding functional restrictions in older adults by means of a Falls-Efficacy Scale. This relationship existed even when history of recent falls and injury were controlled for. The Falls-Efficacy Scale was found to be prospectively related to decline in self-care tasks; however the effect was strongest for those who experienced the greatest decline in performance-related disability (Mendes de Leon, Seeman, Baker, Richardson, & Tinetti, 1996).

In a study of older adults with knee osteoarthritis (OA), Rejeski and colleagues found that self-efficacy beliefs specific to the performance of functional tasks were predictive of performance on these tasks even after controlling for markers of pathology and fitness (1996). Self-efficacy has been linked both cross-sectionally (Foldvari et al., 2000) and prospectively (Seeman, Unger, McAvay, & Mendes de Leon, 1999) to declines

in self-reported disability. However, in contrast to the work by Rejeski and his colleagues (1996), Seeman and her colleagues (1999), failed to find a link between self-efficacy and performance-based functional assessments. This discrepancy may be related to differences in measurement. That is, Seeman and her colleagues employed a broad-based measure of efficacy (ability to arrange transportation, living arrangements, safety, and one's own productivity), whereas Rejeski and his colleagues assessed self-efficacy specific to the tasks being performed. Bandura (1997) has noted that any mismatch between the assessment of self-efficacy and the behavior of interest reduces the strength of the relationship.

Most recently, Rejeski and colleagues (2001) found that self-efficacy beliefs are important in understanding functional decline that occurs with chronic disease and aging. Specifically, Rejeski and colleagues (2001) demonstrate that self-efficacy predicts functional decline in older adults with compromised function due to knee OA. As well, it has been suggested that coupling physical rehabilitation with pain management programs could improve the efficacy of exercise programs on physical function in older adults with knee OA (Rejeski et al., 2001).

Physical symptoms. Clearly the interpretation of physical symptoms that accompany active pathologies and impairments are important sources of self-efficacy information. For example, it is well documented that pain during ambulation is related to self-efficacy (Miller, Rejeski, Reboussin, Ten Have, & Ettinger, 2000) and that fatigue also places limits on what older adults believe they can do (Rejeski et al., 2001). However, in both cross-sectional research (Rejeski et al., 1996) and longitudinal studies (Rejeski et al., 2001), pain has been found to be an independent predictor of functional

limitations after controlling for self-efficacy beliefs. Thus, physical symptoms have both direct and indirect effects on functional. For example, pain and fatigue felt by an individual leads to lack of confidence in ability, which can lead to inactivity. This inactivity can promote a decrease in muscle tone resulting in a quicker physical decline. This in turn leads to poorer self-efficacy for the task.

Though it was presented in the previous section that pain, as a physical symptom, has an effect on the self-efficacy of the individual, it can also be viewed as an outcome expectancy. Within the Social Cognitive Theory, outcome expectancies play a significant role in predicting whether the individual will engage in that specific behavior. Therefore, if an individual feels that a negative physical symptom, such as pain, is going to be a result of the behavior, they are less likely to be willing to perform the given behavior. If the specific behavior is physical activity, this again, can lead to inactivity and a quicker decline in physical abilities.

Social influence. Though social influence is not identified as a major construct of the Social Cognitive Theory, there is no doubt that social factors are important to the process of physical disablement. By definition, disability is a functional limitation placed in a social context (Verbrugge et al., 1994). Assistance from another person can enable one to complete assigned tasks at home or work, whereas absence of social support can dramatically increase disability. Thus, social support is a very important source of self-efficacy beliefs. Recently, McAuley and his colleagues (2003) were able to demonstrate with longitudinal data that social support surrounding physical activity was an important source of self-efficacy beliefs for long-term maintenance of physical activity.

Social support as an extra-individual factor in the disablement process (Verbrugge et al., 1994) can come from a variety of sources. The more sources the individual has, the more likely they are to continue to attempt the functional tasks and build their self-efficacy. Also, social support can have a significant impact on behaviors that will influence the disablement process such as physical activity.

Incentives. Finally, both Rotter (1954) and Bandura (1986) discuss the important role that incentives play in determining behavior. In short, when the value or incentive associated with a given behavior is high, there is a greater motive to perform the behavior. Incentives play numerous roles in the process of disablement. For example, people may give up more quickly or never initiate a behavior that has little incentive value for them. Conversely, if a person has low self-efficacy for a functional task and places a great deal of value on the performance of this behavior, then Rotter (1954) would predict that this creates conflict for the person. He further surmises that it could lead to adjustment disorders, such as anxiety and/or depression.

Rejeski (2003) believes that there are two important components of incentives that need to be evaluated within the context of the disablement process. First, it is important to evaluate an individual's motive for the performance of specific behaviors. This is analogous to evaluating the value or incentive associated with the performance of a given behavior. Second, one must have some index of how satisfied or dissatisfied one is with his or her current perceived abilities or states (Reboussin, Liang, & Reboussin, 1999). For example, an older adult may admit to the value of advanced physical capacities, have limited function for these capacities; yet express little dissatisfaction with his or her current level of functioning.

Because there is no existing measure related to the motives that older adults have for the performance of basic and advanced physical tasks, the objective of this research study was to develop such a measure. In sum, the goal of this study was to create a measure that would enable researchers to assess older adults' *desire for physical competence*.

The study has five specific goals. These are as follows:

1. To create an item pool to be used to develop a measure for the assessment of desire for physical competency (DPC) and to evaluate the content validity of these items.
2. To examine the factor structure of the items as well as the internal consistency reliability of the derived scales.
3. To explore the relationship of the DPC to other established questionnaires for convergent and discriminant validity.
4. To examine the differences between known groups. For example, those with a lower level of education are predicted to have lower scores on the DPC than those with a higher level of education.
5. To test the stability of the DPC over time to establish test-retest reliability.

## **METHODS**

The primary goal of this investigation was to develop and validate a measure that would enable investigators to assess older adults' desire to acquire or maintain their physical competence. The operational definition of this new construct is as follows: Desire for Physical Competence (DPC) reflects the motivational incentive of older adults to possess the ability to perform physical tasks that require either a low level (basic) or moderate level (advanced) of flexibility, strength and/or cardiovascular function. The investigation involved three phases: item and scale development, evaluation of construct validity, and test-retest reliability. The Wake Forest University Institutional Review Board approved all procedures.

### **Item and Scale Development**

In order to develop items for the DPC scale, previous measures that were reviewed were designed to assess the difficulty that older adults have with various tasks that tap into either basic or advanced components of physical function (Jette et al., 2002; Haley et al., 2003). The initial item pool consisted of forty-six different items (see Appendix A). The original 46 items were reduced to 25 by a team of 3 investigators. Items were deleted for the following reasons: (a) ambiguity in the physical demand, (b) redundancy with other items, (c) gender biases, (d) performance was dependent upon outside influence, or (e) the task relied heavily on dexterity.

These 25 items (labeled with an asterisk in Appendix A) were reworded for specificity and clarity (see Appendix B). The final 25 items were examined by an expert

in gerontology to evaluate whether the item pool seemed to evaluate the universe of content for the construct of interest. Because pilot testing suggested that desire did not appear to be different for upper and lower extremity tasks, the main focus was on including items that sampled a range of both basic and advanced competencies. In fact, many upper body tasks had to be eliminated due to obvious gender biases.

The final step in this original phase of the investigation was to select a response scale for the items. Based on the work of Nunnally (1978), a 5-point Likert scale was developed that employed the following verbal anchors: (0) no desire whatsoever, (1) low desire, (2) moderate desire, (3) strong desire, (4) very strong desire. Instructions for completion of the measure read as follows: “Place an X in the box that best describes your current desire to be able to perform each task. *It is very important to remember that we are not interested in whether you can do the task or not; rather, we are interested in your level of desire to be able to do each task.*”

### **Factor Structure and Construct Validity**

The second phase of this investigation involved an exploratory analysis of the DPC measure and an initial evaluation of its construct validity. Alpha Factor Analysis with a varimax rotation was employed to examine the factor structure of the DPC. These results indicated two eight item subscales (DPC-B, basic and the DPC-A, advanced) Construct validity was examined by correlating the DPC with other existing measures that assess related constructs and by insuring that the DPC was not correlated with social desirability. In addition, a “known group” construct validation procedure was employed by hypothesizing that older adults with the lowest SES (< \$15,000) would have lower

scores on the DPC that those in the highest SES category (>\$50,000). Similar analyses were conducted on race and gender, hypothesizing that African Americans and females would have lower scores on the DPC than Caucasians and males, respectively.

### Participants

For this phase of the study, we recruited 157 eligible participants (men = 53; women =104). The only inclusion criteria were that participants had be  $\geq 60$  years of age and capable of understanding the instructions for completing the measure. The initial recruitment consisted of 159 participants. Two participants were deemed ineligible to participate in the study due to their inability to understand instructions. An assessment technician responsible for distributing the measure in the investigation determined that the two participants were not cognitively capable to participate. In addition it was sought to recruit both older men and women in 8 age groups (60-64; 65-69; 70-74; 75-79; 80-84; 85-89; 90-94; 95+) that had a range of functional abilities. Participants were recruited from an assisted living facility, Wake Forest University's Cardiac Rehabilitation program, and several senior activity groups.

### Measures

In addition to the DPC, all participants completed six other questionnaires. These measures were used to gather demographic information on the participants and to evaluate the construct validity of the DPC.

Demographics. Age, gender, race, education level, income level, marital status, living status, and the presence/absence of 6 chronic diseases were acquired by self-report (see Appendix C).

SF-36. The SF-36 is a generic measure of health status consisting of eight

subscales: Physical Functioning, Mental Health, Role-Physical, Role-Emotional, Bodily Pain, General Health, Vitality, and Social Functioning (Ware, 1993). There are also two norm-based composite scales, mental health and physical health. These latter scales have a mean of 50 and a standard deviation of 10. Higher scores on all SF-36 scales indicate more favorable levels of function. For this study, we limited our attention to scales related to physical functioning. Participants were asked to read each question and mark the box next to the appropriate answer (see Appendix D).

Social Desirability. The social desirability scale (SDS) provides a means of determining participants' need for social approval. The intent was to develop a measure of desire for physical competence that was unrelated to the need for social approval, since this would lead to a response bias (Nunnally, 1978). The short form of the SDS is a 13-item true/false questionnaire. Higher scores indicate that an individual is drawn to culturally approved behavior. The SDS (see Appendix E) was developed by Crowne (1960) and has excellent psychometric properties.

Desire for Control. Desire for control assesses the individual's personal control over several aspects of his or her life (Burger, 1984). For the purpose of this study, the modified version was used. Specifically, questions were selected to gain a general understanding with respect to the individual's need for control over certain aspects of their life. For all 10 items, participants were asked to read each question and mark the box next to the appropriate answer a response of never, sometimes, often, or always was required (see Appendix F).

Body Satisfaction. The body satisfaction measure consists of two subscales:

physical function and body appearance. For this study, the body appearance questions were eliminated, since the focus of the study was on physical function. Therefore, the 6 remaining items were rated on a 7-point scale that was scored from -3 to +3 with numbers on the scale anchored by the following phrases: very dissatisfied (-3), somewhat dissatisfied (-2), a little dissatisfied (-1), neither (0), a little satisfied (+1), somewhat satisfied (+2), and very satisfied (+3) (Ray et al., 1996). Participants were asked to read each statement and respond by circling the answer that best describes their level of satisfaction with each of the items (see Appendix G).

Life Satisfaction. The Satisfaction with Life Scale measures the global life satisfaction of an individual. Life satisfaction refers to a cognitive judgmental process assessing a persons' quality of life according to a chosen criteria (Diener, Emmons, Larsen, & Griffin, 1985). Each of the five items was rated on a 7-point scale that was scored from 1 to 7 with numbers on the scale anchored by the following phrases: strongly disagree (1), disagree (2), slightly disagree (3), neither (4), slightly agree (5), agree (6), strongly agree (7). Participants were asked to read the statement and respond by checking the box that best describes their level of satisfaction with each of the items (see Appendix H) and scores on each item were summed. The possible range of scores on this questionnaire is from 5 (low satisfaction) to 35 (high satisfaction).

### Procedures

Following the recruitment process, participants were first given an informed consent form to read and sign. The questionnaire packets were then given to participants to complete and included the DPC and the six questionnaires described above. This packet of questionnaires was administered in two different settings: group and individual.

The group setting involved testing in a classroom-like setting with approximately 20 participants in each group (47 participants), whereas those individuals who completed the questionnaires on their own (the individual setting) did so at home after a thorough explanation of materials in the questionnaire packet. These questionnaires were returned by mail with a response rate of 77% (145 questionnaires were distributed and only 34 were lost leaving a total of 111). All participants were provided with pre-stamped, pre-labeled envelopes. As a small token of appreciation, the group setting participants had their names entered into a lottery for gift certificates to a restaurant. For the individual setting, participants were provided with pedometers.

#### Statistical Analyses

## Procedures

Following the recruitment process, participants in this phase of the study completed only the revised DPC and the demographics questionnaires. This procedure was repeated 2 weeks later. Once the participants completed both questionnaires, they were given a pedometer as a token of appreciation.

## Statistical Analyses

Test-retest reliability was evaluated by graphically displaying the two administrations of the DPC-B and the DPC-A that were administered at two-week intervals. Pearson Product Moment Correlations and t-tests were conducted between the two assessments for both the DPC-B and the DPC-A.

## RESULTS

### Participant Demographics

Table 1 provides selected demographic information on the participants in both Phase II ( $n = 157$ ) and Phase III ( $n = 30$ ) of this investigation. Recall that phase II was designed to evaluate the validity of the measure, whereas phase III was designed to examine test-retest reliability. The mean age ( $\pm$  SD) of participants in phase II was 73.28 ( $\pm$  8.0) years with a range from 60-95 years. The sample population was heterogeneous on age and came from varied ethnic and socioeconomic backgrounds. These individuals also had a variety of chronic diseases.

Participants in phase III had a mean age ( $\pm$  SD) of 73.77 ( $\pm$  7.8) years with a range of 61-90 years of age. This sample was predominately Caucasian and their socioeconomic status was predominately middle to upper-middle class. As with the participants in phase III, these individuals also had a varied of chronic diseases.

**Table 1: Descriptive Characteristics**

<i>Characteristic</i>	Phase II N (%)	Phase III N (%)
Age		
60-64	21 (14)	3 (10)
65-69	37 (24)	7 (23)
70-74	34 (22)	7 (23)
75-79	26 (17)	5 (17)
80-84	23 (15)	5 (17)
85-89	10 (6)	2 (7)
90-94	3 (3)	1 (3)
95-99	2 (1)	0 (0)
Gender		
Female	104 (66)	14 (47)
Male	53 (34)	16 (53)

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Race/Ethnicity		
White	111 (71)	28 (93)
Black	43 (27)	2 (7)
Hispanic/Other	3 (3)	0 (0)
Highest School Grade		
< High school graduate	6 (4)	0 (0)
High school graduate	43 (27)	11 (37)
> High school graduate	108 (69)	19 (63)
Household Income		
Refused to answer	16 (10)	2 (7)
< \$15,000	24 (15)	1 (3)
\$15,000-\$35,000	54 (34)	7 (23)
\$35,000-\$50,000	33 (21)	11 (37)
>\$50,000	30 (19)	9 (30)
Marital Status		
Single	4 (3)	3 (10)
Married	94 (60)	17 (57)
Divorced	12 (8)	1 (3)
Widowed	47 (30)	9 (30)
Living Arrangements		
Alone	56 (36)	11 (37)
With spouse	91 (58)	17 (57)
With family	8 (5)	2 (7)
With non-family	2 (1)	0 (0)
Chronic Diseases		
Arthritis		
No	87 (55)	26 (87)
Yes	70 (45)	4 (13)
Osteoporosis		
No	135 (86)	26 (87)
Yes	22 (14)	4 (13)
Heart Condition		
No	112 (71)	16 (53)
Yes	45 (29)	14 (47)
Breathing Problems		
No	148 (94)	29 (97)
Yes	9 (6)	1 (3)
Stroke		
No	153 (97)	29 (97)
Yes	4 (3)	1 (3)

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Neuromuscular Condition		
No	153 (97)	30 (100)
Yes	4 (3)	0 (0)
Diabetes		
No	128 (82)	24 (80)
Yes	29 (18)	6 (20)
High Blood Pressure		
No	76 (48)	20 (67)
Yes	80 (51)	10 (33)
Hip Fracture		
No	155 (99)	30 (100)
Yes	2 (1)	0 (0)
Liver Disease		
No	156 (99)	30 (100)
Yes	1 (1)	0 (0)
Cancer		
No	142 (90)	26 (87)
Yes	15 (10)	4 (13)
Other		
No	128 (82)	27 (90)
Yes	29 (18)	3 (10)

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#### Dimension Structure of the Desire for Physical Competence Scale (DPC)

To evaluate the dimensional structure of the 16-item DPC, data on 157 older adults recruited into Phase II of the investigation were submitted to an alpha factor analysis with varimax rotation. The means ( $\pm$ SD) for the individual items can be found in Table 2. As expected, the means for the items that describe basic tasks (items 1-8) are higher than those that describe advanced tasks (items 9-16). All of the SDs for the items are close to being 1 or  $>1$ , a desirable feature of items for any psychometric instrument (Nunnally, 1978).

This statistical procedure produced 2 factors with eigenvalues  $>1$  that explained 70.67% of the variance in the 16 items. Examination of the scree plot confirmed that the 2 factor solution provided the best interpretation for these data. Examination of the item

loadings in Table 2 reveals that items 1-8 constitute the basic DPC scale (DPC-B), whereas items 9-16 represent an advanced DPC scale (DPC-A). Both of these scales have excellent Cronbach Alpha Internal Consistency Reliabilities, DPC-B = 0.94 and DPC-A = 0.92.

**Table 2: Dimension Structure of the Desire for Physical Competence Scale**

Question	M ( $\pm$ SD)	Factor Loading	
		One	Two
1	3.51(0.82)	<b>0.88</b>	0.10
2	3.10(1.14)	<b>0.79</b>	0.09
3	3.24(1.02)	<b>0.95</b>	0.07
4	3.29(0.94)	<b>0.81</b>	0.05
5	3.27(0.90)	<b>0.92</b>	0.05
6	3.27(0.99)	<b>0.75</b>	0.12
7	3.23(0.98)	<b>0.82</b>	0.08
8	3.15(1.05)	<b>0.74</b>	0.07
9	2.33(1.25)	0.02	<b>0.82</b>
10	1.90(1.31)	0.10	<b>0.89</b>
11	2.63(1.15)	0.13	<b>0.69</b>
12	2.27(1.27)	0.05	<b>0.79</b>
13	1.81(1.38)	0.05	<b>0.75</b>
14	2.19(1.40)	0.09	<b>0.72</b>
15	2.38(1.26)	0.13	<b>0.64</b>
16	1.57(1.33)	0.06	<b>0.79</b>

Descriptive Statistics for the DPC and Subgroup Comparisons

The mean ( $\pm$ SD) for the basic subscale (DPC-B) was 3.26 ( $\pm$  0.85), whereas the mean ( $\pm$ SD) for the advanced scale was 2.13 ( $\pm$ 1.05), with a range in scores from 0-4. The difference between the two means was statistically significant at  $t_{(156)} = 16.67$ ,

$p < 0.001$ , illustrating that older adults have a stronger desire to perform basic rather than advanced physical activities.

Table 3 provides subgroup analyses on selected demographic variables. It was hypothesized that men would have higher desire scores than women on both DPC subscales. In addition, it was predicted that participants with a lower level of income would have lower scores on the DPC than those in higher income brackets, and that those who lived alone would also have significantly lower scores than those who lived with spouses. In general, there is little evidence that the scores on the DPC-B differed as a function of gender, race, income, education, or living arrangement. Inspection of the data in Table 3 for the DPC-A reveals that those with an income  $< \$15,000$  had lower scores than any other income category [ $t_{(76)}$  for  $< \$15,000$  vs.  $\$15,000-35,000 = 3.91$ ,  $p < 0.05$ ;  $t_{(55)}$  for  $< \$15,000$  vs.  $\$35,000-50,000 = 4.12$ ,  $p < 0.05$ ;  $t_{(52)}$  for  $\$15,000$  vs.  $> \$50,000 = 3.90$ ,  $p < 0.05$ ], where those who lived alone had lower DPC-A scores than those who were married ( $t_{(45)} = 2.77$ ,  $p < 0.05$ ). There is, however, little evidence for gender or racial differences for the DPC-A.

**Table 3: Demographic Variables on Subgroups**

		DPC – B	DPC – A
		M ( $\pm$ SE)	M ( $\pm$ SE)
Gender	Male	3.21 (0.10)	2.26 (0.15)
	Female	3.28 (0.09)	2.07 (0.10)
Race	Caucasian	3.30 (0.08)	2.24 (0.10)
	Black	3.14 (0.14)	1.90 (0.15)
	Other	3.58 (0.25)	1.67 (0.08)
Income	< \$15,000	2.70 (0.23)	1.31 (0.17) <sub>a</sub>
	\$15,000-35,000	3.37 (0.11)	2.26 (0.14) <sub>b</sub>
	\$35,000-50,000	3.51 (0.10)	2.41 (0.19) <sub>b</sub>
	> \$50,000	3.15 (0.14)	2.27 (0.17) <sub>b</sub>
Education	< High School	3.33 (0.29)	1.69 (0.43)
	High School	3.28 (0.12)	2.02 (0.14)
	> High School	3.24 (0.08)	2.21 (0.10)
Living Arrangements	Spouse	3.35 (0.72)	2.31 (0.10) <sub>a</sub>
	Alone	3.15 (0.13)	1.81 (0.15) <sub>b</sub>

*Note:* <sub>a</sub> different from <sub>b</sub> at  $p < 0.05$

### Construct Validity

Correlational analyses were conducted between the Desire for Physical Competence Scale (DPC) and a number of measures that were included in the study to provide either convergent or discriminant validity for the two subscales of the DPC: basic (DPC-B) and advanced (DPC-A). It was hypothesized that the DPC would be positively correlated with desire for control, body satisfaction, and the SF-36 PCS. No correlation was expected between the DPC and the social desirability scale. The correlation matrix can be found in Table 4.

Inspection of these results reveals that although the two subscales of the DPC are strongly correlated with one another ( $r = 0.62$ ), there is also a substantial amount of unique variance in each subscale. Neither subscale of the DPC was influenced by social desirability, providing important evidence for the discriminant validity of the two scales. What is most interesting about the pattern of the correlations in Table 4 is that there is stronger convergent validity for the advanced (DPC-A) as compared to the basic (DPC-B) subscale of the DPC. That is, individuals who scored high on the DPC-A had higher scores on the physical health scale of the SF-36, had higher general desire for control, and more favorable body satisfaction than individuals scoring lower on the DPC-A. In contrast, the DPC-B subscale was positively correlated with only the SF-36 and DPC-A measure. Moreover, the relationship with the SF-36 was substantially lower ( $r = 0.23$ ) for the DPC-B than for the DPC-A ( $r = 0.42$ ). Neither the DPC-A nor the DPC-B were related to overall life satisfaction; however, life satisfaction was related to body satisfaction ( $r = 0.46$ ), desire for control ( $r = 0.20$ ), social desirability ( $r = 0.19$ ), and the SF-36 ( $r = 0.24$ ).

**Table 4: Correlational Analyses**

Scale	DPC-B	DPC-A	SF-36	SD	DC	BS	LS
1. DPC-B	1	0.66**	0.23**	0.03	0.10	0.13	0.05
2. DPC-A		1	0.42**	-0.07	0.24**	0.24**	0.04
3. SF-36			1	-0.01	0.11	0.52**	0.24**
4. SD				1	-0.32**	0.13	0.19*
5. DC					1	0.19*	0.20*
6. BS						1	0.46**
7. LS							1

\*\* p<0.01; \* p<0.05

DPC-B = Desire for Physical Competence Basic Subscale  
DPC-A = Desire for Physical Competence Advance Subscale  
SF-36 = SF-36 Physical Composite Score  
SD = Social Desirability Questionnaire  
DC = Desire for Control Questionnaire  
BS = Body Satisfaction Questionnaire  
LS = Life Satisfaction Questionnaire

#### Test – Retest Reliability

To further examine the psychometric properties of the DPC measure, a two-week test-retest reliability was conducted. The correlations between the two administrations of the instrument were high, 0.93 and 0.93 for the DPC-B and DPC-A subscales, respectively. In addition, there was no difference between the means for the pretest and posttest scores on either the DPC-B or DPC-A, as seen in Table 5.

**Table 5: Test-Retest Reliability**

	Pretest M (±SD)	Posttest M (±SD)	$t_{(29)}$ p<0.05
DPC-B	3.25 (0.67)	3.25 (0.63)	26.73
DPC-A	2.59 (0.88)	2.60 (0.92)	16.03

## DISCUSSION

The intent of this investigation was to develop and validate a measure to assess desire for physical competence (DPC) that could be used for adults who were 60 years of age or older. This measure builds on available measurement tools that can be employed to examine the role of social cognitive theory (Bandura, 1986) on the process of physical disablement (Verbrugge et al., 1994).

A pool of 46 items that dealt with physical competence was generated for the initial phase of scale development. This item pool was then narrowed to 25 items based on the evaluation of each item for clarity, content validity, and simplicity. The response scale for each item ranged from “no desire whatsoever” (0) to a “very strong desire” (4). A follow-up factor analysis of the 25 items, revealed that 16 of the 25 items loaded greater than 0.6 on two unrotated factors, basic (DPC-B) and advanced (DPC-A) subscales, and that both subscales had excellent internal consistency and test-retest reliabilities.

Evidence was also provided for the convergent validity of the DPC scales. Specifically, individuals with higher DPC-A scores had a higher general desire for control (Burger, 1984), were more satisfied with their physical function (Ray et al., 1996; Reboussin et al., 1999) and had more favorable perceptions of their physical health (Ware, 1993) than those with lower DPC-A scores. In contrast, the DPC-B had a significant correlation only with the SF-36 composite physical health scale. Although it cannot be certain why the DPC-B did not correlate with body satisfaction or the general measure of desire for control, a plausible explanation is that the population sampled for this

investigation was not compromised in 'basic' function. These participants were active within their community as well as their physical activities. Further research is warranted on the DPC-B with frail older adults who report disruption in basic activities of daily living.

As further evidence for the construct validity of the DPC, comparisons were made between men and women, older adults with different levels of income, and individuals who were married versus those living alone. These comparisons were based on data showing that (a) men are more physically active than women (US Department of Health and Human Services Editorial Staff, 1996), (b) there is a well known social gradient in physical function among older adults (Ford et al., 1991), and (c) people who are socially isolated participate in fewer physical activities than those who have a strong social support structure (Satariano, Haight, & Tager, 2002). Data from this investigation revealed that a threshold effect existed for income in that those making <\$15,000 a year had lower DPC-A scores than any other income category. There were no significant effects for the DPC-B scale and there was no evidence for a social gradient with the DPC-A scale. That is, once individuals made over \$15,000, income had no effect on DPC-A scores.

Consistent with the work of Satariano et al. (2002), we also found that individuals who lived alone had lower DCP-A scores than those who were married. However, surprisingly there was no evidence for a gender effect. These preliminary data suggest that older women may have a desire to be physically competent at a level that is comparable to men. Perhaps then, differences in physical activity levels typically observed between men and women are a function of differences in self-efficacy beliefs

(Bandura, 1986). There is good evidence from research on older adults that men have stronger self-efficacy beliefs for physical functioning than women (US Department of Health and Human Services Editorial Staff, 1996).

### **Future Research and Limitations**

There are a number of interesting research questions that might be pursued in future investigations with the DPC scale. Further research is warranted with the DPC-B on more frail populations. Clearly not including a frail population was the major limitation of the current study design. Other limitations of this study include (a) the absence of any objective measures of physical function, and (b) the inability to collect data on physical activity behavior, and (c) the cross-sectional nature of the tests for construct validity.

An objective measure may allow the relationship between self-efficacy beliefs and involvement in physical activity programs to be better understood by considering differences in desire for physical competence. That is, we would expect the highest levels of involvement in physical activity by older adults who have high self-efficacy beliefs coupled with a high desire to be physically competent. This hypothesis is certainly consistent with the early work of Rotter (1954). Another interesting area of research is to pursue the development and testing of strategies to enhance desire for physical competence among older adults. These sorts of interventions could take place at multiple levels of analysis (McKinlay & Marceau, 2000) and involve national campaigns, local campaigns in assisted living facilities, and even face-to-face cognitive-behavioral interventions.

It would also be interesting to examine the effect that low efficacy and high desire for physical competence may have on psychological functioning. For example, Rotter (1954) hypothesized that psychological distress is greatest when people value an outcome and yet feel helpless (i.e., they have low self-efficacy in being able to perform the necessary behavior). Ultimately, it would seem that self-efficacy and desire for physical competence are both important in the active steps that older adult take with their health care. It may well be that low desire for physical competence is a predictor of both morbidity and mortality in older adult populations.

### **Clinical and Public Health Implications**

The validity and use of the DPC were mentioned in the previous section of this discussion. Focus should now be on the benefits this measure, including the assistance it may provide to society and to health care providers. The DPC provides insight into the amount of desire individuals have for being physical competence. On the clinical front, doctors who know their patients' desire for physical competence could reinforce the importance of the domain and refer them to various resources in the community to maintain and/or enhance their physical competence. Individuals with a high desire and physical capability to perform a specific task may some day receive activity prescriptions for at-home exercise. If an individual has a high desire to perform a specific task but a low efficacy on his or her ability, then the focus should be on interventions to enhance self-efficacy beliefs. In referring older adults to activity groups within the community, primary care physicians or other health care providers may be able to provide individuals with a social support system and thus slow down the disablement process. Targeting

subgroups with a lower desire for physical competency, such as those in lower income brackets and socially isolated people, may decrease the admission rates to nursing care facilities. This, in turn, would decrease the financial burden on both the individual and on society.

## APPENDIX A

### Initial Item Pool

<b>ADVANCED LOWER EXTREMITY FUNCTION</b>
1. Hike a few miles including hills*
2. Carry and climb a flight of stairs*
3. Carry and climb two flights of stairs*
4. Walk a brisk mile*
5. Go up and down 1 flight, no rails*
6. Walk one mile with rests*
7. Run to catch bus*
8. Walk on slippery surface*
9. Heavy work around yard*
10. Go up and down 3 flights inside
11. Walk several blocks
12. Run one-half mile*
13. Participate in an exercise class*
14. Get up from floor*
<b>BASIC LOWER EXTREMITY FUNCTION</b>
15. Walk around one floor of home*
16. Pick up a kitchen chair
17. Get into and out of car*
18. Reach overhead while standing*
19. Wash dishes while standing*
20. Up and down from a curb*
21. Put on and take off coat
22. Open heavy outside door
23. On and off bus
24. Make bed
25. Bend over from standing position*
26. Go up and down a flight of stairs, with rails*
27. On and off a step stool*
28. Stand up from a low soft couch*

<b>ADVANCED UPPER EXTREMITY FUNCTION</b>
29. Remove gift-wrap with hands only
30. Remove plastic seal from medicine bottle with hands only
31. Unscrew new jar lid with hands only
32. Pour liquid from a large full pitcher
33. Put on and take off pants (zipper and button)*
34. Reach behind back, as if to scratch mid-back*
35. Button up a dress shirt with small buttons
36. Write a two-page letter
37. Clean a bathtub/shower
38. Vacuum a large room with an upright, self-propelled vacuum*
<b>BASIC UPPER EXTREMITY FUNCTION</b>
39. Hold a full glass of water
40. Put away groceries/put clothes from washer into dryer
41. Pass dinner plates around a table
42. Cradle a baby
43. Pick up small child while seated
44. Hold a full hand of cards (7-13 cards in a fan)
45. Carry a tray of food a short distance*
46. Tie a bow

\* initial items selected for the DPC questionnaire

## APPENDIX B

### Desire of Physical Competence

Having the ability to ...
PA1 ... walk on a slippery or uneven surface
PA2 ... carry a ten pound object while climbing one flight of stairs
PA3 ... carry a ten pound object while climbing two consecutive flights of stairs
PA4 ... walk at a quick pace for a mile
PA5... walk up and down a flight of stairs with no handrails
PA6 ... walk a mile, resting as needed
PA7 ... jog/run a short distance (20-50 ft)
PA8 ... put on and take off your clothing
PA9 ... get up from the floor from a kneeling or sitting position
PA10 ... walk around one floor of a home
PA11 ... get into and out of a car
PA12 ... lift light objects (less than 5lbs) overhead while standing
PA13 ... stand in one place for fifteen to twenty minutes
PA14 ... step on and off a curb as if to cross a street
PA15 ... do light work around the home
PA16 ... bend over from a standing position
PA17 ... walk up and down flight of stairs (hand rails available)
PA18 ... step on or off a small step stool
PA19 ... stand up from a low, soft couch/chair
PA20 ... reach behind your back, as if to scratch the middle of your back
PA21 ... walk 3 miles on hilly, uneven paths
PA22 ... do heavy work around a home
PA23 ... to walk while carrying a light object (less than 5lbs)
PA24 ... participate in an exercise class
PA25 ... jog/run ½ mile nonstop

**APPENDIX C**

**Demographics**

Please write your age on the first line and an **X** in the box for all answers that apply to you.

Age \_\_\_\_\_

**Gender**

Male       Female

**Race**

Caucasian       Black       Asian       Hispanic       Other  
(non Hispanic origin)

**Education Level**

Less than High School       High School       One year or more after High School

**Income Level**

< \$15,000       \$15,000-35,000       \$35,000-50,000       >\$50,000

**Marital Status**

Single       Married       Divorced       Widowed

**Living Status (check all that apply)**

Alone       With Spouse       With Family       With Non- Family

**Chronic Diseases**

Arthritis

Osteoporosis

Visual  
Impairment  
Condition

Heart

Breathing  
Neuromuscular  
Problems  
Condition

Anxiety/  
Depression

Stroke

Diabetes  
Disease

High Blood  
Pressure

Hip Fracture

Liver

Cancer

Other\_\_\_\_\_

## APPENDIX D

**SF-36 INSTRUCTIONS:** Please read each question carefully and mark the box next to the appropriate answer.

1. In general, would you say your health is:

*Excellent*       *Very good*       *Good*       *Fair*       *Poor*

2. Compared to one year ago, how would you rate your health in general now?

*Much better now than one year ago*       *Somewhat better now than one year ago*       *About the same as one year ago*       *Somewhat worse now than one year ago*       *Much worse now than one year ago*

3. THE FOLLOWING ITEMS ARE ABOUT ACTIVITIES YOU MIGHT DO DURING A TYPICAL DAY. DOES YOUR HEALTH NOW LIMIT YOU IN THESE ACTIVITIES? IF SO, HOW MUCH?

a) Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports

*Yes, limited a lot*       *Yes, limited a little*       *No, not limited at all*

b) Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf

*Yes, limited a lot*       *Yes, limited a little*       *No, not limited at all*

c) Lifting or carrying groceries

*Yes, limited a lot*       *Yes, limited a little*       *No, not limited at all*

d) Climbing several flights of stairs

*Yes, limited a lot*       *Yes, limited a little*       *No, not limited at all*

**DOES YOUR HEALTH NOW LIMIT YOU IN THESE ACTIVITIES? IF SO, HOW MUCH?**

**e) Climbing one flight of stairs**

*Yes, limited  
a lot*

*Yes, limited  
a little*

*No, not limited  
at all*

**f) Bending, kneeling or stooping**

*Yes, limited  
a lot*

*Yes, limited  
a little*

*No, not limited  
at all*

**g) Walking more than a mile**

*Yes, limited  
a lot*

*Yes, limited  
a little*

*No, not limited  
at all*

**h) Walking several blocks**

*Yes, limited  
a lot*

*Yes, limited  
a little*

*No, not limited  
at all*

**i) Walking one block**

*Yes, limited  
a lot*

*Yes, limited  
a little*

*No, not limited  
at all*

**j) Bathing or dressing yourself**

*Yes, limited  
a lot*

*Yes, limited  
a little*

*No, not limited  
at all*

**4. DURING THE PAST 4 WEEKS, HAVE YOU HAD ANY OF THE FOLLOWING PROBLEMS WITH YOUR WORK OR OTHER REGULAR DAILY ACTIVITIES AS A RESULT OF YOUR PHYSICAL HEALTH?**

**a) Cut down on the amount of time you spent on work or other activities?**

- YES  
 NO

**b) Accomplished less than you would like**

- YES
- NO

**c) Were limited in the kind of work or other activities?**

- YES
- NO

**d) Had difficulty performing the work or other activities (for example, it took extra time/effort)**

- YES
- NO

**5. DURING THE PAST 4 WEEKS, HAVE YOU HAD ANY OF THE FOLLOWING PROBLEMS WITH YOUR WORK OR OTHER REGULAR DAILY ACTIVITIES AS A RESULT OF ANY EMOTIONAL PROBLEMS (SUCH AS FEELING DEPRESSED OR ANXIOUS?)**

**a) Cut down on the amount of time you spent on work or other activities**

- YES
- NO

**b) Accomplished less than you would like**

- YES
- NO

**c) Didn't do work or other activities as carefully as usual**

- YES
- NO

**6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends neighbors, or groups?**

- Not at all*
- Slightly*
- Moderately*
- Quite a bit*
- Extremely*

7. How much bodily pain have you had during the past 4 weeks?

- |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> |
| <i>None</i>              | <i>Very Mild</i>         | <i>Mild</i>              | <i>Moderate</i>          | <i>Severe</i>            | <i>Very Severe</i>       |

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

- |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> |
| <i>Not at all</i>        | <i>Slightly</i>          | <i>Moderately</i>        | <i>Quite a bit</i>       | <i>Extremely</i>         |

9. The following questions ask you about how you have felt during the past 4 weeks. Please choose the one answer that comes closest to the way you have been feeling.

**HOW MUCH OF THE TIME DURING THE PAST 4 WEEKS...**

a) did you feel full of pep?

- |                          |                          |                               |                          |                             |                          |
|--------------------------|--------------------------|-------------------------------|--------------------------|-----------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>    | <input type="checkbox"/> |
| <i>All of the time</i>   | <i>Most of the time</i>  | <i>A good bit of the time</i> | <i>Some of the time</i>  | <i>A little of the time</i> | <i>None of the time</i>  |

b) have you been a very nervous person?

- |                          |                          |                               |                          |                             |                          |
|--------------------------|--------------------------|-------------------------------|--------------------------|-----------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>    | <input type="checkbox"/> |
| <i>All of the time</i>   | <i>Most of the time</i>  | <i>A good bit of the time</i> | <i>Some of the time</i>  | <i>A little of the time</i> | <i>None of the time</i>  |

c) have you felt so down in the dumps nothing could cheer you up?

- |                          |                          |                               |                          |                             |                          |
|--------------------------|--------------------------|-------------------------------|--------------------------|-----------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>    | <input type="checkbox"/> |
| <i>All of the time</i>   | <i>Most of the time</i>  | <i>A good bit of the time</i> | <i>Some of the time</i>  | <i>A little of the time</i> | <i>None of the time</i>  |

d) have you felt calm and peaceful?

- |                          |                          |                               |                          |                             |                          |
|--------------------------|--------------------------|-------------------------------|--------------------------|-----------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>    | <input type="checkbox"/> |
| <i>All of the time</i>   | <i>Most of the time</i>  | <i>A good bit of the time</i> | <i>Some of the time</i>  | <i>A little of the time</i> | <i>None of the time</i>  |

e) did you have a lot of energy?

- |                          |                          |                               |                          |                             |                          |
|--------------------------|--------------------------|-------------------------------|--------------------------|-----------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>      | <input type="checkbox"/> | <input type="checkbox"/>    | <input type="checkbox"/> |
| <i>All of the time</i>   | <i>Most of the time</i>  | <i>A good bit of the time</i> | <i>Some of the time</i>  | <i>A little of the time</i> | <i>None of the time</i>  |

**HOW MUCH OF THE TIME DURING THE PAST 4 WEEKS...**

**f) have you felt downhearted and blue?**

- |                            |                             |                                   |                             |                                 |                             |
|----------------------------|-----------------------------|-----------------------------------|-----------------------------|---------------------------------|-----------------------------|
| <input type="checkbox"/>   | <input type="checkbox"/>    | <input type="checkbox"/>          | <input type="checkbox"/>    | <input type="checkbox"/>        | <input type="checkbox"/>    |
| <i>All of<br/>the time</i> | <i>Most of<br/>the time</i> | <i>A good bit<br/>of the time</i> | <i>Some of<br/>the time</i> | <i>A little of<br/>the time</i> | <i>None of<br/>the time</i> |

**g) did you feel worn out?**

- |                            |                             |                                   |                             |                                 |                             |
|----------------------------|-----------------------------|-----------------------------------|-----------------------------|---------------------------------|-----------------------------|
| <input type="checkbox"/>   | <input type="checkbox"/>    | <input type="checkbox"/>          | <input type="checkbox"/>    | <input type="checkbox"/>        | <input type="checkbox"/>    |
| <i>All of<br/>the time</i> | <i>Most of<br/>the time</i> | <i>A good bit<br/>of the time</i> | <i>Some of<br/>the time</i> | <i>A little of<br/>the time</i> | <i>None of<br/>the time</i> |

**h) have you been a happy person?**

- |                            |                             |                                   |                             |                                 |                             |
|----------------------------|-----------------------------|-----------------------------------|-----------------------------|---------------------------------|-----------------------------|
| <input type="checkbox"/>   | <input type="checkbox"/>    | <input type="checkbox"/>          | <input type="checkbox"/>    | <input type="checkbox"/>        | <input type="checkbox"/>    |
| <i>All of<br/>the time</i> | <i>Most of<br/>the time</i> | <i>A good bit<br/>of the time</i> | <i>Some of<br/>the time</i> | <i>A little of<br/>the time</i> | <i>None of<br/>the time</i> |

**i) did you feel tired?**

- |                            |                             |                                   |                             |                                 |                             |
|----------------------------|-----------------------------|-----------------------------------|-----------------------------|---------------------------------|-----------------------------|
| <input type="checkbox"/>   | <input type="checkbox"/>    | <input type="checkbox"/>          | <input type="checkbox"/>    | <input type="checkbox"/>        | <input type="checkbox"/>    |
| <i>All of<br/>the time</i> | <i>Most of<br/>the time</i> | <i>A good bit<br/>of the time</i> | <i>Some of<br/>the time</i> | <i>A little of<br/>the time</i> | <i>None of<br/>the time</i> |

**10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?**

- |                            |                             |                             |                                 |                             |
|----------------------------|-----------------------------|-----------------------------|---------------------------------|-----------------------------|
| <input type="checkbox"/>   | <input type="checkbox"/>    | <input type="checkbox"/>    | <input type="checkbox"/>        | <input type="checkbox"/>    |
| <i>All of<br/>the time</i> | <i>Most of<br/>the time</i> | <i>Some of<br/>the time</i> | <i>A little of<br/>the time</i> | <i>None of<br/>the time</i> |

**11. HOW TRUE OR FALSE IS EACH OF THE FOLLOWING STATEMENTS FOR YOU?**

**a) I seem to get sick a little easier than other people**

- |                            |                          |                          |                          |                             |
|----------------------------|--------------------------|--------------------------|--------------------------|-----------------------------|
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>    |
| <i>Definitely<br/>true</i> | <i>Mostly<br/>true</i>   | <i>Don't<br/>know</i>    | <i>Mostly<br/>false</i>  | <i>Definitely<br/>false</i> |

**b) I am as healthy as anybody I know**

- |                            |                          |                          |                          |                             |
|----------------------------|--------------------------|--------------------------|--------------------------|-----------------------------|
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>    |
| <i>Definitely<br/>true</i> | <i>Mostly<br/>true</i>   | <i>Don't<br/>know</i>    | <i>Mostly<br/>false</i>  | <i>Definitely<br/>false</i> |

**c) I expect my health to get worse**

*Definitely  
true*

*Mostly  
true*

*Don't  
know*

*Mostly  
false*

*Definitely  
false*

**d) My health is excellent**

*Definitely  
true*

*Mostly  
true*

*Don't  
know*

*Mostly  
false*

*Definitely  
false*

## APPENDIX E

### Attitudes/Traits

Listed below are 13 statements about personal attitudes and traits. Read each item and decide whether the statement is true or false for you personally. We ask that you mark TRUE or FALSE for each statement.

**1) It is sometimes hard for me to go on with my work if I am not encouraged.**

True

False

**2) I sometimes feel resentful when I don't get my way.**

True

False

**3) On a few occasions, I have given up doing something because I thought too little of my ability.**

True

False

**4) There are times when I felt like rebelling against people in authority even though I knew they were right.**

True

False

**5) No matter whom I am talking to, I'm always a good listener.**

True

False

**6) There have been occasions when I took advantage of someone.**

True

False

**7) I'm always willing to admit to it when I make a mistake.**

True

False

**8) I sometimes try to get even rather than forgive and forget.**

True

False

**9) I am always courteous, even to people who are disagreeable.**

True

False

**10) I have never been irritated when people expressed ideas very different from my own.**

True

False

**11) There have been times when I was quite jealous of the good fortunes of others.**

True

False

**12) I am sometimes irritated by people who ask favors of me.**

True

False

**13) I have never deliberately said something that hurt someone's feelings.**

True

False

## APPENDIX F

### Likes and Dislikes

Below you will find a series of statements. Please read each statement carefully and respond to it by putting an **X** in the box that you believe the statement applies to you. For all items, a response never, sometimes, often, or always is required.

- 1. I prefer a job where I have a lot of control over what I do and when I do it.**

Never                       Sometimes                       Often                       Always

- 2. I try to avoid situations where someone else tells me what to do.**

Never                       Sometimes                       Often                       Always

- 3. Others usually know what is best for me.**

Never                       Sometimes                       Often                       Always

- 4. I enjoy being able to influence the actions of others.**

Never                       Sometimes                       Often                       Always

- 5. I would prefer to be a leader than a follower.**

Never                       Sometimes                       Often                       Always

**6. I wish I could push many of life's daily decisions off on someone else.**

Never

Sometimes

Often

Always

**7. When I see a problem, I prefer to do something about it rather than sit by and let it continue.**

Never

Sometimes

Often

Always

**8. When it comes to orders, I would rather give them than receive them.**

Never

Sometimes

Often

Always

**9. I like to wait and see if someone else is going to solve a problem so that I don't have to be bothered with it.**

Never

Sometimes

Often

Always

**10. I enjoy making my own decisions.**

Never

Sometimes

Often

Always

## APPENDIX G

### Body Satisfaction

Please read each statement carefully and respond by circling the answer that best describes your level of satisfaction with each of the 6 items.

In the past 4 weeks, how satisfied have you been with...

**1) your overall level of physical fitness?**

-3	-2	-1	0	+1	+2	+3
Very	Somewhat	A little	Neither	A little	Somewhat	Very
Dissatisfied	Dissatisfied	Dissatisfied		Satisfied	Satisfied	Satisfied

**2) the muscle strength in your legs?**

-3	-2	-1	0	+1	+2	+3
Very	Somewhat	A little	Neither	A little	Somewhat	Very
Dissatisfied	Dissatisfied	Dissatisfied		Satisfied	Satisfied	Satisfied

**3) your level of endurance or stamina?**

-3	-2	-1	0	+1	+2	+3
Very	Somewhat	A little	Neither	A little	Somewhat	Very
Dissatisfied	Dissatisfied	Dissatisfied		Satisfied	Satisfied	Satisfied

**4) your muscle tone?**

-3	-2	-1	0	+1	+2	+3
Very	Somewhat	A little	Neither	A little	Somewhat	Very
Dissatisfied	Dissatisfied	Dissatisfied		Satisfied	Satisfied	Satisfied

**5) your overall level of energy?**

-3	-2	-1	0	+1	+2	+3
Very	Somewhat	A little	Neither	A little	Somewhat	Very
Dissatisfied	Dissatisfied	Dissatisfied		Satisfied	Satisfied	Satisfied

**6) your physical ability to do what you want or need to do?**

-3	-2	-1	0	+1	+2	+3
Very	Somewhat	A little	Neither	A little	Somewhat	Very
Dissatisfied	Dissatisfied	Dissatisfied		Satisfied	Satisfied	Satisfied

## APPENDIX H

### Life Satisfaction

Please read each statement carefully and respond to it by checking the box that best describes your level of satisfaction with each of the 5 items.

**1) In most way my life is close to my ideal.**

<input type="checkbox"/>						
Strongly Disagree	Disagree	Slightly Disagree	Neither	Slightly Agree	Agree	Strongly Agree

**2) The conditions of my life are excellent.**

<input type="checkbox"/>						
Strongly Disagree	Disagree	Slightly Disagree	Neither	Slightly Agree	Agree	Strongly Agree

**3) I am satisfied with my life.**

<input type="checkbox"/>						
Strongly Disagree	Disagree	Slightly Disagree	Neither	Slightly Agree	Agree	Strongly Agree

**4) So far I have gotten the important things I want in life.**

<input type="checkbox"/>						
Strongly Disagree	Disagree	Slightly Disagree	Neither	Slightly Agree	Agree	Strongly Agree

**5) If I could live my life over, I would change almost nothing.**

<input type="checkbox"/>						
Strongly Disagree	Disagree	Slightly Disagree	Neither	Slightly Agree	Agree	Strongly Agree

## APPENDIX I

### Component Loading

	Component Loadings	
	One	Two
PA1	0.18	0.68
PA2	0.25	<b>0.83</b>
PA3	0.16	<b>0.84</b>
PA4	0.32	<b>0.76</b>
PA5	0.28	<b>0.79</b>
PA6	0.48	0.59
PA7	0.16	<b>0.73</b>
PA8	0.80	0.05
PA9	0.69	0.45
PA10	0.86	0.14
PA11	<b>0.84</b>	0.18
PA12	<b>0.76</b>	0.35
PA13	0.45	0.54
PA14	<b>0.87</b>	0.26
PA15	<b>0.79</b>	0.27
PA16	<b>0.85</b>	0.31
PA17	<b>0.76</b>	0.39
PA18	0.71	0.46
PA19	<b>0.80</b>	0.36
PA20	<b>0.75</b>	0.31
PA21	0.31	<b>0.73</b>
PA22	0.31	<b>0.67</b>
PA23	0.68	0.45
PA24	0.47	0.40
PA25	0.19	<b>0.73</b>

## APPENDIX J

### Desire for Physical Competence

Listed below are statements that describe different physical challenges. Please read each statement carefully and place an **X** in the box that best describes your current *desire* to be able to perform each task/challenge. **It is very important to remember that we are not interested in whether you can do the tasks or not; rather, we are interested in your level of desire to be able to do each task/challenge.**

#### 1. Having the ability to get into and out of a car

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

#### 2. Having the ability to walk up and down a flight of stairs with no handrails

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

#### 3. Having the ability to lift light objects (less than 5 lbs.) overhead while standing

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

#### 4. Having the ability to do heavy work in the house or yard

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

**5. Having the ability to stand up from a low, soft couch/chair**

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

**6. Having the ability to jog/run a short distance (20-50 ft)**

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

**7. Having the ability to step on and off a curb as if to cross a street**

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

**8. Having the ability to carry a ten pound object while climbing one flight of stairs**

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

**9. Having the ability to bend over from a standing position to pick up a small object from the floor**

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

**10. Having the ability to walk at a quick pace for a mile**

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

**11. Having the ability to reach behind your back, as if to scratch the middle of your back**

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

**12. Having the ability to walk 3 miles on hilly, uneven paths**

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

**13. Having the ability to do light work in the home or yard**

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

**14. Having the ability to carry a ten-pound object while climbing two consecutive flights of stairs**

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

**15. Having the ability to walk up and down flight of stairs (hand rails available)**

<input type="checkbox"/>				
No Desire Whatsoever	Low Desire	Moderate Desire	Strong Desire	Very Strong Desire

**16. Having the ability to jog/run 1/2 mile nonstop**

No Desire  
Whatsoever

Low  
Desire

Moderate  
Desire

Strong  
Desire

Very Strong  
Desire

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