

The Pennsylvania State University

The Graduate School

College of Health and Human Development

**PHYSICAL ACTIVITY IN LATER LIFE:
THE ROLE OF CONSTRAINTS, NEGOTIATION, MOTIVATION,
SELECTIVE OPTIMIZATION WITH COMPENSATION (SOC), AGE AND GENDER**

A Thesis in

Leisure Studies

by

Julie Stafford Son

© 2006 Julie Stafford Son

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

August 2006

The thesis of Julie Stafford Son was reviewed and approved* by the following:

Deborah L. Kerstetter
Associate Professor of Recreation, Park and Tourism Management
Thesis Advisor
Co-Chair of Committee

Andrew J. Mowen
Assistant Professor of Recreation, Park and Tourism Management
Co-Chair of Committee

Melissa A. Hardy
Distinguished Professor of Human Development and Family Studies, Sociology, and
Demography

Careen M. Yarnal
Assistant Professor of Recreation, Park and Tourism Management

Laura Payne
Assistant Professor of Recreation, Sport and Tourism
Special Member

John Dattilo
Professor and Department Head of Recreation, Park and Tourism Management

*Signatures are on file in the Graduate School.

ABSTRACT

The aim of this study was to elucidate the leisure constraint negotiation process—the relationships between leisure constraints, leisure negotiation strategies, motivation, and leisure behavior—for the physically active leisure of people fifty and older. To accomplish this aim, three investigations were conducted.

The first study tested and extended Hubbard and Mannell's (2001) models of leisure constraint negotiation, replicating the finding that negotiation fully mediates motivation and participation but also finding, in contrast, that constraints and negotiation have independent, counterbalancing effects on participation.

The second study examined whether or not these relationships were maintained across multiple dimensions of physically active leisure (frequency, duration, and a combination of these subdimensions with activity intensity) while controlling for the effects of age and gender. Including age and gender yielded the same result for activity frequency but a different result for overall physically active leisure. In the latter case, negotiation only partially mediated the influence of motivation on participation. Further, frequency fully mediated the effects of constraints, negotiation, and gender on duration.

The third study added selective optimization with compensation (SOC) to the examination of the constraint negotiation process of physically active leisure. There were significant interactions between SOC and motivation for negotiation strategies and physical activity duration. In the case of negotiation, there was a positive relationship between SOC and negotiation across motivation levels, with increases most pronounced for people with low motivation. In the case of duration, there was a negative relationship between SOC and duration for people with low to moderate motivation whereas there was a positive relationship between

SOC and duration for people with high motivation.

Taken altogether, these results suggest that SOC, age, gender and multidimensional measures of physical activity can help contribute to our understanding of the constraint negotiation process. Further research is needed to examine these factors longitudinally and within the general population to understand these relationships over time and in diverse contexts. In turn, revealing the nuances of the constraint negotiation process for physically active leisure participation has implications for leisure-based health promotion programming.

TABLE OF CONTENTS

List of Figures	viii
List of Tables	ix
Acknowledgements	x
Chapter 1: Introduction	1
Literature Review and Theoretical Framework	2
Social Psychology of Leisure	2
Social Psychology of Human Development and Aging	4
Leisure Constraints Theory	8
Gendered Life Course Perspective: An Argument for Examining the Influence of Age and Gender	13
Multidimensionality of Physical Activity Participation	16
Research Purpose, Questions, and Hypotheses	18
Broader Impacts of the Proposed Research	22
Research Design and Methods	22
Population and Sampling	22
Pilot Test	23
Data Collection: Self-Administered Questionnaires	24
The Survey Instrument	25
Physical Activity	25
Selection, Optimization, and Compensation	26
Leisure Constraint and Negotiation Strategies	27
Motivation	28
Data Analysis	28
References	30
Orientation to Chapter 2	42
Chapter 2: Testing Leisure Constraint Negotiation Models with an Older Sample in a Metropolitan Park Setting	43
Abstract	43
Introduction	44
Leisure Constraint Negotiation	44
Leisure Constraint Negotiation Models	45
The Balance Proposition and Alternative Model Extension	49
The Constraint Negotiation Process and Age	50
Study Purpose, Research Objectives and Research Questions and Hypotheses	51
Research Questions and Hypotheses	52
Methods	53
Respondents and Procedure	53
Measures	54

Data Analysis	56
Results.....	59
Sub-sample Comparisons.....	59
Respondent Characteristics.....	59
Item Consistency and Descriptive Information	60
Evaluating the Leisure Constraint Negotiation Models.....	62
Testing the moderating effects of motivation and negotiation on constraint....	62
Testing the independence and mediation (i.e., constraint-effects-mitigation and perceived-constraint-reduction) models of constraint negotiation.....	62
Discussion	66
Constraint and Negotiation Measurement Issues.....	66
The Balance and Buffer Hypotheses.....	68
The Role of Motivation in Constraint Negotiation	69
Negotiation Strategies and Resources—Are They Just Facilitators?	71
Understanding Constraint Negotiation in Context.....	72
Conclusion	75
References.....	77
 Orientation to Chapter 3.....	 83
 Chapter 3: Physically Active Leisure and Its Subdimensions: What About Age and Gender in the Constraint Negotiation Process?	 84
Abstract	84
Introduction.....	85
Leisure Constraints and Negotiation.....	85
Motivation and Constraint Negotiation	87
Constraints, Physical Activity and Participant Characteristics.....	88
Multidimensionality of Physically Active Leisure	90
Study Purpose and Research Objectives.....	92
Methods.....	93
Respondents and Procedure	93
Instrumentation	93
Data Analysis	96
Results.....	99
Sub-sample Comparisons, Respondent Profile and Descriptive Data	99
Model Testing	100
Measurement and Structural Equations	100
Model 1: Mediation of Overall Levels of Physically Active Leisure.....	101
Model 2: Mediation of Frequency and Duration of Physically Active Leisure.....	103
Discussion	104
The Role of Age and Gender on Leisure Constraints	104
Determining the Mediating Influence of Negotiation Strategies on Constraints and Motivation.....	105
Determining the Mediating Influence of Frequency on the Relationships of the Predictors to Duration.....	107

Unique Contributions to Physically Active Leisure	109
Conclusions.....	111
References.....	113
Orientation to Chapter 4.....	120
Chapter 4: What is the Role of Selective Optimization with Compensation (SOC) in Later Life Leisure-Time Physical Activity?	122
Abstract.....	122
Introduction.....	123
Study Background.....	124
Leisure Constraints and Negotiation Strategies	124
Selective Optimization with Compensation (SOC)	126
Motivation and SOC	128
Physical Activity Multidimensionality	129
Study Purpose and Research Objectives.....	130
Methods.....	131
Respondents	131
Procedure	131
Measures	132
Data Analysis	137
Results.....	138
Interactive Effect of SOC and Motivation on Negotiation	138
Interactive Effect of SOC and Motivation on Overall Leisure-Time Physical Activity	140
Interactive Effects of SOC and Motivation on Frequency and Duration.....	141
Discussion.....	145
Conclusion	150
References.....	152
Chapter 5: Summary and Conclusions.....	160
Summary of Key Findings	160
Implications.....	166
Future Research Directions.....	168
References.....	174
Appendix: Questionnaire	175

LIST OF FIGURES

Figure 1.1: Hubbard and Mannell's (2001) hypothesized model of constraint-effects-mitigation	18
Figure 1.2: Path model of the proposed relationships between SOC, constraints, negotiation, motivation, age and gender on physical activity participation	21
Figure 2.1: Hubbard and Mannell's (2001) four hypothesized models of the constraint negotiation process.....	47
Figure 2.2: The motivation-balance model: A hypothesized model of the constraint negotiation process based on the relationships proposed to exist between constraint, negotiation, motivation, and participation	49
Figure 2.3: The constraint-negotiation dual channel model for physically active leisure in later life: Final latent variable model of the relationships between constraint, negotiation, motivation, and participation	66
Figure 3.1: Model 1: Hypothesized model for overall physically active leisure	98
Figure 3.2: Model 2: Hypothesized model for frequency and duration.....	99
Figure 3.3: The role of age, gender, constraints, negotiation and motivation on overall level of physically active leisure: Final model	102
Figure 3.4: The role of age, gender, constraints, negotiation and motivation on frequency and duration: Final model	103
Figure 4.1: Graph of the interactive effect of SOC and motivation on negotiation strategies	139
Figure 4.2: Hypothesized model of the interactive effects of SOC and motivation on frequency and duration of physical activity.....	141
Figure 4.3: The interactive effect of SOC and motivation on frequency and duration: Trimmed path model.....	143
Figure 4.4: Graph of the interactive effect of SOC and motivation on physical activity duration	144

LIST OF TABLES

Table 2.1: Descriptive Statistics for the Participation, Constraint, Negotiation, and Motivation Variables	60
Table 2.2: Summary of Fit Indices for the Independence, Constraint-Effects-Mitigation and Perceived-Constraint-Reduction Models: Hubbard and Mannell’s (2001) Study and This Study	64
Table 2.3: Summary of Fit Indices for the Reduced Independence Model and the Constraint-Negotiation Dual Channel Model	65
Table 4.1: Examples of Items Used to Measure the Components of SOC, Motivation, Negotiation, and Constraints.....	133
Table 4.2: Predicted Negotiation Scores Showing the Interactive Effect of SOC and Motivation.....	139
Table 4.3: Regression Analysis for the Prediction of Overall Leisure-Time Physical Activity	140
Table 4.4: Regression Analysis for the Prediction of Frequency and Duration of Physical Activity	142
Table 4.5: Predicted Physical Activity Duration Scores Showing the Interactive Effect of SOC and Motivation.....	144

ACKNOWLEDGEMENTS

First and foremost, I would like to acknowledge Deb Kerstetter for her patient guidance and encouragement as my advisor throughout my tenure as a doctoral student at Penn State. I am also thankful to both her and Andy Mowen for their direction and support as the co-chairs of my dissertation. I would also like to thank Garry Chick and Al Graefe for their advice and feedback on numerous academic matters. And, I am appreciative of the direction Deb, Garry, Andy and Geof Godbey gave me on the pursuance of grant and fellowship funding. I would also like to acknowledge the advisement and support of Careen Yarnal and Melissa Hardy; their willingness to help me in a pinch is truly commendable.

I would certainly be remiss if I neglected to extend thanks to my departmental colleagues and many others throughout the Penn State and the University of Nevada, Reno communities, whose friendship and camaraderie has made my university experiences both professionally and personally rewarding.

This dissertation research would not have been possible without the funding and staff support of Cleveland Metroparks. I will be forever grateful for the wonderful experience I have had thanks to Andy graciously introducing me to this standout metropolitan park district. It was a pleasure to work with the CMP staff, and I would like to extend special thanks to Noreen Lazor, Sue Duffy and Heather Triplett for their help with the data collection logistics.

To My Family: Thank you, Steve, for your tireless humor, cooking, and just generally keeping things in order throughout my pursuit of the doctoral degree. You sat through many an intolerable soliloquy or, perhaps worse, an obliged discussion about theory, research methods and even statistics. Last, but certainly not least, thank you mom, dad, umma, appa, sisters, and brothers, for your unwavering support throughout both of our doctoral programs.

CHAPTER 1

INTRODUCTION

Physical activity has received a lot of research attention for its positive effects on health, with such diverse benefits as improving physical health (Oguma, Sesso, Paffenbarger, & Lee, 2001), activities of daily living (ADL) functioning (Shephard, 1997), cognitive ability (Farbrigoule, Letenneur, & Dartigues, 1995), and mental health (Kull, 2002) while reducing morbidity and lowering all-cause mortality (Kujala, 2004). Despite these many benefits, the majority of U.S. citizens do not get adequate amounts of physical activity (CDC: Centers for Disease Control, 2000a). Further, older adults tend to have the lowest levels of physical activity participation across age demographics (CDC, 2000b). Given the fact that 75% of adults will live past age 65 (Mathieu, 1999), individual quality of life issues and the societal and economic impacts of caring for older adults with functional limitations are important issues to address through health promotion strategies such as physical activity.

Researchers have attempted to understand low levels of physical activity from several perspectives. For example, they have conducted studies assessing differences in physical activity levels based on sociodemographic factors and barriers (Lee, 2003; Wilcox et al., 2003) and intraindividual change in social cognitive factors as a result of short duration exercise interventions (McAuley, 1991, 1992; McAuley et al., 2003; Sallis et al., 1986). They have also attempted to determine the factors involved in lifelong patterns of physical activity participation and nonparticipation, relying upon qualitative research methods and female samples (Kluge, 2002; O'Brien Cousins, 1997; O'Brien Cousins & Keating, 1995).

Leisure researchers have used a model of leisure constraints to understand physical activity participation and nonparticipation (Alexandris & Carroll, 1997; Alexandris, Barkoukis, Tsorbatzoudis, & Groulos, 2003; Alexandris, Tsorbatzoudis, & Grouios, 2002; Carroll & Alexandris, 1997; Hubbard & Mannell, 2001). A few have assessed differences between the leisure constraints of men and women affecting physical activity participation (e.g., Jackson & Henderson, 1995) and others have started to examine the ways that specific negotiation strategies relate to leisure constraints and motivation (Hubbard & Mannell, 2001).

Even with the application of diverse research perspectives toward understanding physical activity participation, the picture is still incomplete, with little understanding about the ways people may utilize both general life management strategies and specific leisure negotiation strategies to maintain physical activity across the lifespan. Conceptualized as a general life management strategy, Baltes and Baltes' (1990) Selective Optimization with Compensation (SOC) Theory may be useful in understanding physical activity participation. However, little research has tested SOC in leisure contexts in general (Burnett-Wolle & Godbey, 2004; McGuire, Boyd, & Tedrick, 2004), let alone in the leisure domain of physical activity. The proposed study will bridge this research void by studying the relationships between SOC management strategies, constraint negotiation, and physical activity participation.

Literature Review and Theoretical Framework

Social Psychology of Leisure

Social psychology is the scientific study of how individuals think about, interact with, and influence each other, individually and in groups (Bordens & Horowitz, 2002). Myers (2001) highlights the main foci in the social psychological study of human behavior, including the study

of social thinking, social influence, and social relations. Social thinking refers to the way that people think about the self and others while social influence refers to the social and cultural forces of conformity, persuasion, and group dynamics that influence attitudes. Social relations refer to the attitudinal and behavioral outcomes of interactions with one another, interactions that may be either positive or negative. Examples of social relations include the disparate social psychological processes of altruism and prejudice; the altruistic act of helping others is a positive action that results in positive social relations whereas the prejudicial act of racist (or sexist, ageist, etc.) comments results in negative social relations.

Leisure researchers have used social psychological theory to understand a diverse array of leisure phenomena. Evidence of leisure researchers' strong reliance on social psychological theory is most cogent in the textbooks written on the social psychology of leisure. The first text of its kind, written by Iso-Ahola (1980), provided a research agenda for studying leisure from a social psychological perspective. A more recent text by Mannell and Kleiber (1997) extends this work to utilize social psychological theory by providing a review of relevant theories, their connections to leisure theories, as well as presenting the findings and implications of research pertaining to the social psychology of leisure.

Social psychology continues to form the theoretical basis for much of current leisure research. In fact, the predominant theoretical perspective of North American leisure scientists today is social psychology (Samdahl, 1999). For example, studies have been conducted based on self-determination theory, particularly the relationship between leisure behavior and intrinsic and extrinsic motivation (e.g., Mannell, Zuzanek, & Larson, 1988). Another social psychological theory that has received a fair amount of attention is locus of control and its relationship to leisure behavior (Kleiber & Hemmer, 1981; Mannell & Bradley, 1986; Nickerson

& Ellis, 1991; Wankel, Mummery, Stephens, & Craig, 1994). Other applications of social psychology to leisure include studies of motivation (Lounsbury & Polik, 1992; Robinson, 1992), satisfaction (Ragheb & Griffith, 1982; Riddick, 1985), socialization (Kleiber & Kelly, 1980; Larson & Kleiber, 1993), and identity formation (Haggard & Williams, 1992; Kelly, 1983; Shaw, Kleiber, & Caldwell, 1995), to name a few. The social psychology of leisure continues to be a predominant area of inquiry with recent research developments in the area of Selective Optimization with Compensation (Janke & Davey, 2004; Oh, 2005).

Social Psychology of Human Development and Aging

Baltes and Baltes (1990) have articulated a social psychological theory of human development and aging—Selective Optimization with Compensation (SOC)—that seems particularly relevant in understanding physical activity participation. SOC describes the life management strategies used to deal with activity limitations across the lifespan due to inevitable biological declines in health culminating in death (Baltes, 1997). Increasing age results in loss of functional abilities (i.e., activities of daily living) but, at the same time, enhanced opportunities to use cultural and social resources (e.g., informal social support networks, social welfare programs). In essence, behavioral outcomes result from the interaction between the environment—both the physical and social situation—and individual characteristics. More specifically, personality characteristics—particularly life management strategies of goal orientation—interact with social and physical resources and constraints to result in the capacity to attain the highest levels of everyday functioning (Baltes & Carstensen, 1996).

Selective Optimization with Compensation echoes Lawton's (1989) model of person and environment fit, with its emphasis on adaptation and emotional regulation leading to "successful

aging”; the attainment of the highest levels of functional ability as we age. Understanding the behavioral outcomes tied to successful aging depends on the accurate articulation of the meaning and importance individuals attach to desired goals (Baltes & Carstensen, 1996). However, people do not accomplish desired goals in isolation from a social context; rather, they minimize functional losses and maximize resources through interaction (Baltes & Carstensen, 1999, 2003). Along these lines, Baltes and Carstensen (1999) have conveyed how SOC Theory is within the purview of the social psychology of aging.

As SOC Theory indicates, there are three life management processes: selection, optimization, and compensation. The first strategy, selection, refers to limiting participation in certain life domains, limiting specific tasks or goals within a domain or multiple domains, and/or emphasizing new or redefined goals. In the case of physical activity, older adults may substitute physical activity for more passive engagements, they may select fewer physical activities in which to engage, they may select a new physical activity, or they may redefine an activity goal from a half hour to fifteen minutes. The second strategy, optimization, refers to garnering resources, both internal and external, to maximize gains. For instance, older adults may start an activity program provided by a local not-for-profit agency to maximize their chances of living independently in an older house with steep stairs. Or, older adults may develop meaningful friendships with physically active older adults with whom they can learn new skills or model healthy behaviors. The third strategy, compensation, refers to adaptation through increased utilization of external resources in the face of limitations. In terms of resources, older adults may rely upon friends or family for social and/or physical support to participate in desired activities. For instance, older adults using a wheelchair may rely upon others to take them for a walk whereas previous to the disability and subsequent wheelchair use, they would go for a walk

without assistance. As another example, older adults may learn skills, such as how to use a wheelchair, to continue desired activities.

Recent research by Freund and Baltes (1998, 2002) indicates that age is a discriminating factor for SOC strategies. In a validation study of the short version of the SOC Questionnaire, they found that older participants engaged in less SOC behaviors than their younger peers (Freund & Baltes, 1998). Similarly, in a study conducted to determine the validity of a longer version of the original SOC instrument, they documented that most SOC behaviors increased from young to middle adulthood and then decreased in old age (Freund & Baltes, 2002). Specifically, middle-aged adults utilized the highest levels of SOC strategies compared to both younger and older adults, which Freund and Baltes used as evidence to support the perspective that the developmental apex of SOC is middle adulthood.

There is little research on selective optimization with compensation within the context of leisure, although leisure researchers in recent years have underscored its relevance for study (Burnett-Wolle & Godbey, 2004; McGuire, Boyd, & Tedrick, 2004). Examples of the few studies that have been conducted include Ryan, Anas, Beamer, and Bajorek's (2003) research on visual impairments and reading behavior and Lang, Rieckmann, and Baltes' (2002) research on resource utilization for leisure activities.

Ryan et al. (2003) conducted in-depth interviews with older adults with visual impairments and found that the strategies used for dealing with barriers to reading reflected the process of selection, optimization, and compensation. Selection occurred in the context of goal tenacity or goal flexibility, in which the person had to decide whether or not to strive for a goal or to modify the goal. For instance, people with vision loss decided to continue, relinquish, simplify or restrict instrumental activities requiring reading. Optimization of functional ability

for tasks included older adults engaging in new learning, practicing skills, and downplaying relinquished tasks. Compensation strategies centered on the incorporation of assistive devices and assistance from others. Ryan et al.'s (2003) findings highlighted the types of life management strategies used, underscoring the importance of both modifying behaviors and utilizing social and physical resources to maintain desired activities.

In another study, Lang et al. (2002) utilized longitudinal data from the Berlin Aging Study and found that resource rich older adults (those above the median split on sensorimotor-cognitive and social-personality resources) reduced the diversity of their leisure activities, suggesting a process of selection occurs, in which only those leisure activities leading to the realization of the most desired goals are continued. The resource rich group also selected fewer passive leisure activities than the resource poor group. Lang et al. also found evidence for optimization, with the finding that resource rich older adults optimized social resources by spending more time with family than did resource poor older adults. These results also suggested that resource rich older adults used compensation strategies by sleeping more and varying time commitments across leisure activities. The finding that resource rich older adults selected physical activities more than their resource poor peers suggests that physical activity is a more salient goal for people with more resources but, unfortunately, this study did not examine the possible ways that these resources may be used to maintain physical activity levels.

Payne (1998) used SOC Theory to interpret the finding that middle-aged and older adult arthritis sufferers with sedentary and "mixed" (characterized by diverse leisure activities) leisure lifestyles had better perceived physical health than physically active older adults. She suggested that compensation strategies related to alternating between physical activity and more sedentary activities may lead to the successful management of ongoing arthritis symptoms for older adults.

The results of these recent studies reflect the importance of understanding the way people interact with their social and physical worlds to select, optimize and compensate to accomplish desired outcomes. However, it is important to note that an SOC measure was not used in either the Lang et al. (2002) or the Payne (1998) studies. Furthermore, research has not directly examined whether or not SOC strategies positively influence physical activity participation. Nor has research examined whether or not the relationship between SOC and physical activity may depend on motivation, a possibility elaborated further in the next section. The proposed study will utilize *Selective Optimization with Compensation Theory* to understand older adults' current levels of physical activity participation.

Leisure Constraints Theory

As with SOC, leisure constraints theory is another useful theory for understanding leisure participation. Crawford, Jackson, and Godbey (1991) proposed a hierarchical model of leisure constraints—intrapersonal, interpersonal, and structural. Intrapersonal constraints define the behavioral aspect such as confidence in one's abilities and fear of getting hurt. Interpersonal constraints reflect the social environment of family and friends while structural constraints refer to the physical environment and situation, such as time, facilities, and money. Crawford et al. (1991) emphasized the process of constraint negotiation, in which there is a hierarchy of importance from proximal (intrapersonal) to distal (structural) constraints, as well as socioeconomic impacts, on the ways people perceive and experience constraints.

In a further refinement of research on leisure constraints, Jackson, Crawford, and Godbey (1993) extended several hypotheses on the negotiation of leisure constraints as possible explanations for the results of several constraint studies (Kay & Jackson, 1991; Scott, 1991;

Shaw, Bonen, & McCabe, 1991). For example, they underscored the fact that leisure constraints and their negotiation may lead to modified participation rather than outright nonparticipation. They also articulated five propositions about successful negotiation of constraints, interactions between constraints, and balance between constraints and motivations. These authors provided an argument for the ways in which behavioral and cognitive negotiation strategies reflect processes consistent with social exchange theory (Thibaut & Kelley, 1959) and cognitive dissonance (Festinger, 1957). For instance, in the case of cognitive dissonance, activities that a person perceives as unobtainable are devalued while, in the case of social exchange, interpersonal negotiation of constraints depends on a person's evaluation of the rewards and costs of the negotiation.

Using a sample of high school students, Raymore, Godbey, Crawford, and von Eye (1993) developed an instrument to measure intrapersonal, interpersonal, and structural constraints as a test of the hierarchical constraints model, with confirmation of the factor structure except in one instance (i.e., "others' money"). Their results supported the three leisure constraint types and their hierarchical nature, with the exception that they found greater numbers of people lower on all levels of constraints than expected.

Alexandris and his colleagues developed an instrument for assessing constraints to physical activity participation using age diverse samples (Alexandris & Carroll, 1997; Alexandris, Barkoukis, Tsorbatzoudis, & Groulos, 2003; Alexandris, Tsorbatzoudis, & Grouios, 2002; Carroll & Alexandris, 1997) and found support for its theoretical usefulness. However, there is limited research regarding the influence of age on leisure constraints. Of the studies that have been conducted, the relationship appears to depend on the type of constraint. For example, intrapersonal constraints appear to increase with age (Alexandris & Carroll, 1997; Searle &

Jackson, 1985) whereas structural constraints have a different relationship with age. Lack of time, for example, has an inverted-U relationship to age (McGuire, Dottavio, & O'Leary, 1986) and financial constraints decline with age (Jackson, 1993). Further, the relationship between overall levels of constraints (rather than type) and age is not well understood (Alexandris et al., 2003).

Hubbard and Mannell (2001) used structural equation modeling to test four models of leisure constraint negotiation—independence, buffer, mitigation, and reduction—based on different perspectives of how constraints, negotiation and motivation are interconnected and influence participation. They tested these alternate models with a sample of 186 employees with physical activity participation as the dependent variable. They found strong support for the constraint-effects-mitigation model; constraints decreased participation but also triggered greater use of negotiation resources, which counteracted these negative effects.

Hubbard and Mannell's (2001) findings support several of Jackson et al.'s (1993) constraint negotiation propositions and clarify the role of motivation. They found that the constraint-effects-mitigation model was the best fitting model, with the direct path from motivation to participation omitted from the model. In effect, encountering constraints led to two opposing processes—an inhibitory influence of constraints on participation and a facilitating influence of the negotiation efforts triggered by the constraints. The latter process appeared to counteract the negative influence of constraint to some extent. In addition, motivation had an indirect effect on physical activity participation through negotiation strategies. People who were highly motivated to participate engaged in more negotiation strategies leading, in turn, to increased participation. In contrast to Carroll and Alexandris (1997), Hubbard and Mannell did not find support for a direct relationship between motivation and participation. However, it is

unknown whether SOC had a role in these relationships. For example, it is possible that the relationship between motivation and negotiation strategies depends on the level of SOC-related goal orientation. Unmotivated people may use similar negotiation strategies regardless of different levels of SOC. On the other hand, motivated people with high levels of SOC may utilize negotiation strategies more than those with low levels of SOC. Further, it is possible that the relationship between SOC and physical activity participation depends on motivation. SOC strategies might relate more positively to physical activity for people with high levels of motivation as compared to those with lower levels of motivation.

Hubbard and Mannell's (2001) negotiation strategies/resources may reflect domain-specific tools used to select, optimize and compensate for physical activity. For instance, learning new activities and budgeting money reflect optimization strategies whereas asking for help in learning skills and asking children to help with chores reflect compensation strategies. Hence, the leisure constraint negotiation process is consistent with SOC Theory and appears to reflect domain-specific strategies to overcome constraints rather than the more general life management and goal orientation of SOC.

Despite theoretical development, the leisure constraints research has not focused on the relationship between constraints and other potentially meaningful constructs for activity participation, such as SOC. Whether or not constraints influence SOC orientation is currently unknown. Perhaps leisure constraints trigger SOC strategies in similar fashion to negotiation strategies. Or, perhaps constraints only trigger domain specific negotiation strategies—such as saving money for fitness activities or trying to find people with whom to participate in physical activity—rather than the general life management strategies of SOC.

Further, a complete understanding of leisure constraints is limited without the incorporation of physical health status as a constraint. Health status affects leisure activities by acting as a barrier to leisure opportunities (Coleman & Iso-Ahola, 1993). Physical health limitations can impede participation in a wide range of leisure activities, including physical activity participation. For example, Bialeschki and Henderson's (1988) research findings indicated that health problems may limit trail use and Strain, Grabusic, Searle, and Dunn's (2002) longitudinal study of older adults found that health and functional ability were related to ceasing leisure activities, including walking cessation. Fear of health problems as a result of physical leisure activity also has emerged as an important constraint on leisure behavior. For instance, fear of falling may limit the leisure activities of older adults (Murphy, Williams, & Thomas, 2002). Therefore, specifying the role of subjective physical health status as a constraint will help broaden our understanding of physical activity participation and nonparticipation.

In support of increased attention on physical health as a constraint, Shaw, Bonen, and McCabe (1991) found that ill health was one of only two constraints associated with lower participation. Injury had no relationship to participation in this study but that may not be surprising, given the fact that only 11% of their sample was physically *inactive*. The finding that injury was not a significant constraint may be at least partially explained by the fact that active adults have fewer intrapersonal constraints, including fear of getting hurt, than do inactive adults (Alexandris & Carroll, 1997; Alexandris et al., 2003). Perhaps sedentary adults are more likely to perceive an injury as a constraint to physical activity participation than active adults.

Jackson and Henderson (1995) have provided support for assessing constraints for physical activity participation in terms of gender. They found that women were more constrained overall in their physical activity than men, even when age, income and family

structure were controlled. Women were significantly more likely to report having difficulty finding others with whom to participate, being too busy with family, having low self-efficacy for physical activity, not knowing where to participate, not knowing where to learn an activity, not being at ease in social situations, being physically unable to participate, and lacking transportation. They found as many within-gender differences as between-gender differences, indicating that the other variables in the model—including age—were also important factors influencing the relationship between constraints and physical activity participation. According to these authors, more research is needed that looks at how men and women are able to negotiate constraints to successfully participate in physical activity.

Gendered Life Course Perspective: An Argument for Examining the Influence of Age and Gender

Moen (2001) presents an argument for the gendered nature of the life course, which is implicitly compatible with Eagly's (1987) Social Role Theory. Moen contends that gender is important from three standpoints: 1) the variations in men's and women's circumstances (incidence, timing, and duration of roles); 2) differences between men and women in the same types of roles and relationships; and 3) gender within the larger social and cultural context.

Elder and colleagues's (Elder, 1995; Elder, 2000; Elder & Johnson, 2003; Elder, Johnson, & Crosnoe, 2003) life course perspective is central to Moen's view of gender issues (Moen, 2001). The five principles of the life course are: 1) the principle of human development and aging as lifelong processes; 2) the principle of human agency; 3) the principle of time and place; 4) the principle of timing; and 5) the principle of linked lives. Moen (2001) emphasizes the importance of timing, time and place, and linked lives for the gendered life course in terms of biographical paths, pacing, the role of relationships, turning points, and issues of inequality,

historical convergence, and structural lag. All of these factors are consistent with Social Role Theory (Eagly, 1987), in which the salience of social roles is based on gender.

Research findings support the gendered life course perspective. For example, Moen and colleagues (Moen, Robinson, & Dempster-McClain, 1995; Moen, Robinson, & Fields, 1994) found that, at advanced ages, older women are more likely to lose a spouse and enter a nursing home than are men. In terms of linked lives, men and women differ in the key turning point of caregiving, with women more likely to care for children and infirm relatives.

Moen (2001) provided a cogent description of the gendered life course process during retirement. The different turning points and trajectories of men and women occur in all three stages of the retirement process. These stages are: 1) planning and expectations, 2) execution, and 3) constructing a postretirement lifestyle. The two aspects of constructing retirement—post-retirement employment and volunteer community service—are life course processes influenced by gender. Recent research by Moen and colleagues highlights the importance of the gendered life course in retirement. In the case of postretirement employment, men are more likely than women to have a paid job, even after career retirement (Han & Moen, 1999; Moen, Fields, Quick, & Hofmeister, 2000).

Moen (2001) also discussed findings pertaining to differences between men and women on several aspects of health, including functional capacity, exercise, and well-being to provide support for the gendered life perspective. The finding that older women exercise less than older men is one such example (Rhodes et al., 1999). For instance, Vertinsky (1995) suggested that social norms for women's participation in passive activities spans to medieval times and women have historically been discouraged from participation in more vigorous activities and sports. Thus, the accepted social roles for women have influenced their experiences over the lifespan in

ways that are strikingly different from men's experiences. Other roles and norms related to women's work and family also may impact women's continued lower levels of physical activity.

Moen (2001) entreats social science researchers to study the life course principle of interdependence rather than independence and to consider multiple aspects of people's lives in their research, such as age and gender. She concludes that understanding the relationship between gender and life stage patterns can serve to link individuals' choices with the constraints of their social environment.

This latter point highlights the compatibility between Moen's gendered life course perspective and the theories of leisure constraints and SOC. For instance, men and women may differ in the selection, optimization, and compensation for physical activity across the life span due to differences in roles, turning points, and relationships. On the one hand, women's higher levels of close relationships (Antonucci, Akiyama, & Takahashi, 2004; Berscheid, 1994) may provide a social support resource for optimizing physical activity but, on the other hand, these relationships may constrain physical activity participation through role expectations and role fulfillment. Viewing gender as central to understanding different patterns of leisure is not novel to leisure researchers, who have a long history of studying gender differences in leisure participation as well as the unique features of women's leisure (Aitchison, 2003; Henderson, Bialeschki, Shaw, & Freysinger, 1996; Jackson & Henderson, 1995; Shaw, 1999). However, accounting for the relationships between gender, leisure constraints, and SOC is.

In a study of the life course predating Moen's articulation of the gendered life course perspective, Altergott and McGreedy (1993) found that over the lifespan men participated in more leisure overall, and active leisure specifically, than did women. These authors point to the potential importance of gender roles as an influence on older women's physical activity

participation. These findings are consistent with the gendered life course perspective and lend support for the use of this perspective for understanding physical activity participation levels.

Shaw et al.'s (1991) findings also support examining the effects of gender and age on physical activity participation. They found that age accounted for eight percent of the variance in physical activity participation and women's physical activity participation was lower than men's. Reflecting a gendered life course perspective, Shaw et al. suggested that it is not being female or older that is the constraint but rather the experience of gender and age in society.

Stanley and Freysinger (1995) also documented the effects of gender and age on physical activity participation. Their results showed that women had lower sports participation at two separate time periods (1975 and 1991) than did men and both men and women showed significant decreases in participation at follow-up sixteen years later. Furthermore, Wilcox et al. (2003) found that older age was independently associated with lower physical activity for African American and Caucasian women.

Based on its compatibility with SOC and leisure constraints theory, the proposed study will utilize the gendered life course perspective and its attendant emphasis on gender and age differences to understand the relationships between the study constructs and physical activity participation.

Multidimensionality of Physical Activity Participation

Leisure constraints researchers (Jackson & Henderson, 1995; Kay & Jackson, 1991; Mannell & Zuzanek, 1991; Raymore et al., 1993) have suggested that time constraints may affect the frequency and duration of physical activity. However, the degree to which constraints influence frequency and duration may differ. This possibility is consonant with Kay and

Jackson's (1991) finding that constraints may be perceived without leading to nonparticipation. Instead, people may continue to participate (frequency stays the same) but for shorter periods of time per session (duration decreases) in order to "save" time.

Similarly, different types of negotiation may play varying roles in the frequency and duration of physical activity. For instance, someone engaged in interpersonal negotiation may be more likely to negotiate opportunities for participation (frequency) in desired physical activities but, at the same time, may be more willing to compromise on the length of engagement (duration) in these activities.

Motivation may also contribute to frequency and duration of physical activity participation in different ways. For example, motivation to participate in physical activity might have more influence on frequency of participation but relatively little influence on duration. Unfortunately, studies that include motivation have not utilized multiple measures of physical activity (Alexandris et al., 2002; Carroll & Alexandris, 1997; Hubbard & Mannell, 2001).

There is also little understanding about the possible relationship between frequency and duration, although it seems probable that the number of days spent per week participating in leisure-based physical activity pursuits (frequency) would be associated with the number of hours per week engaging in these activities (duration). However, little is known about the way that frequency and duration may relate to each other or the way that other factors may differentially influence these aspects of physical activity.

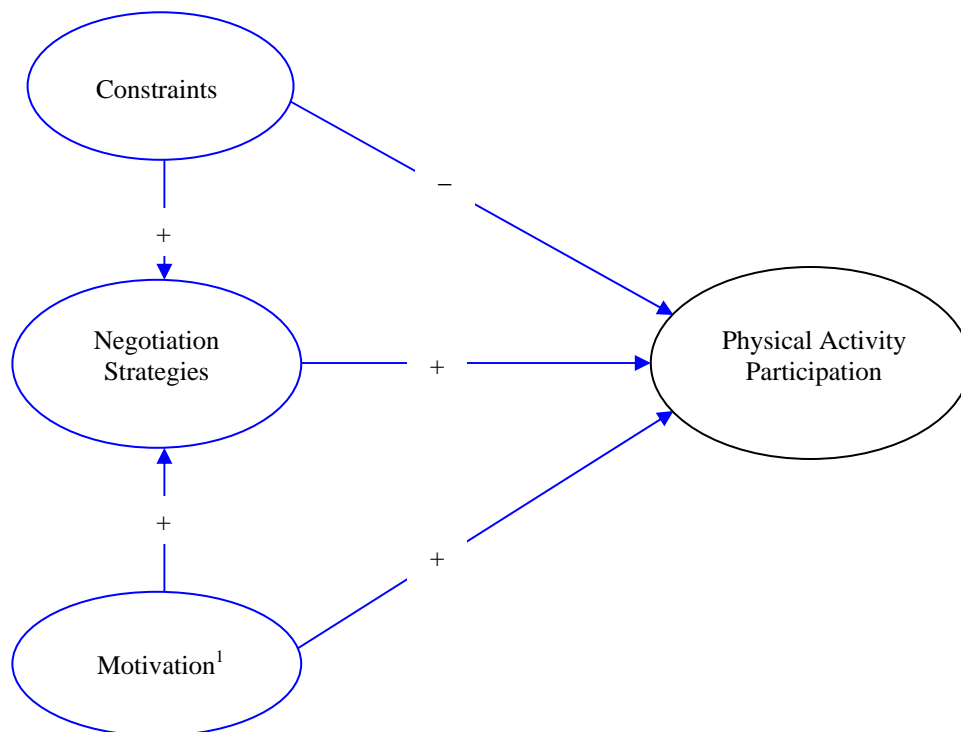
Utilizing multidimensional measures of physical activity may lead to more accurate empirical tests of explanatory factors and their relative importance. Revealing the patterns of the relationships between overall physical activity and its subdomains might also reveal some

important distinctions that would help inform the design and implementation of programs intended to increase physical activity participation.

Research Purpose, Questions, and Hypotheses

The purpose of the proposed research study was to elucidate the relationships between SOC, constraints, negotiation, motivation, age and gender for physical activity participation in later life. To test these relationships, I built upon Hubbard and Mannell's (2001) hypothesized model, which is depicted in Figure 1.1.

Figure 1.1 Hubbard and Mannell's (2001) hypothesized model of constraint-effects-mitigation.



¹Although hypothesized, Hubbard & Mannell (2001) did not find evidence of a direct relationship between motivation and physical activity participation.

Figure 1.2 provides an extension of the model to address the following research questions and hypotheses.

1. Is SOC positively related to physical activity participation?
2. Is motivation positively related to physical activity participation?
3. Is age positively related to constraints?
4. When controlling for age and gender, do constraints influence SOC?
5. When controlling for age and gender, is there an interaction between negotiation and constraints on physical activity participation?
6. When controlling for age and gender, is there an interaction between motivation and constraints on physical activity participation?
7. When controlling for age, is there an interaction between SOC and motivation on negotiation strategies?
8. When controlling for age, is there an interaction between SOC and motivation on physical activity participation?
9. Is there a good fitting model of the relationships between SOC, constraints, negotiation strategies, motivation, age, gender, and physical activity participation?

There were seven hypotheses related to the study purpose that are supported by previous research:

H1. Age will be negatively related to SOC.

H2. Age will be negatively related to physical activity participation.

As indicated in Hypotheses 1 and 2, I expect to find age negatively related to SOC (Freund & Baltes, 1998, 2002) and physical activity (Rhodes et al., 1999; Stanley & Freysinger, 1995; Wilcox et al., 2003).

H3. Female gender will be negatively related to physical activity participation.

H4. Female gender will be positively related to constraints.

Hypotheses 3 and 4 indicate that I expect female gender to be negatively related to physical activity participation (Rhodes et al., 1999; Stanley & Freysinger, 1995) and positively related to constraints (Jackson & Henderson, 1995).

H5. People with higher levels of constraint will have lower physical activity participation.

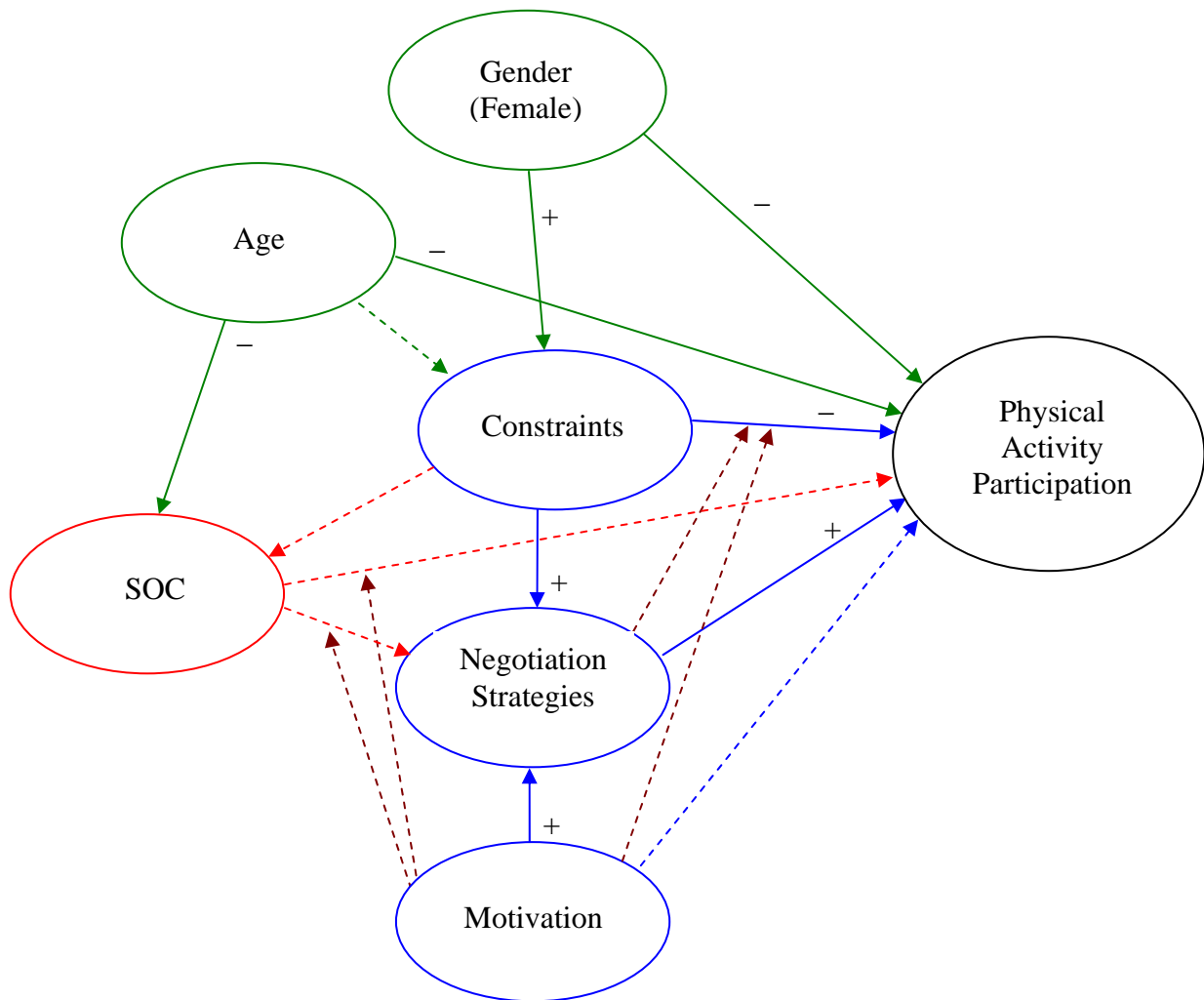
H6. People with higher levels of constraint will have greater use of negotiation strategies.

H7. Motivation will have an indirect, positive relationship with physical activity through negotiation strategies.

Hypotheses 5 through 7 indicate that I also expect to find support for Hubbard and Mannell's (2001) constraint-effects-mitigation final model. This model indicates that higher levels of constraint will decrease physical activity participation while at the same time triggering negotiation strategies that partially mitigate the negative influence of constraints on physical activity. This model also indicates that motivation will have an indirect effect on physical activity through negotiation strategies; motivation will increase negotiation and, in turn, negotiation will increase physical activity.

One objective of the current research was to compare the possible differences in these proposed relationships depending on what measure of physical activity was used—frequency, duration or a weighted sum score of frequency, duration and intensity. Therefore, some of the research questions and hypotheses guiding this study were tested using an overall physical activity participation score (weighted sum score of frequency, duration and intensity), as well as the subcomponents of frequency and duration.

Figure 1.2 Path model of the proposed relationships between SOC, constraints, negotiation, motivation, age and gender on physical activity participation.



Key:

Blue: Components of Hubbard & Mannell's (2001) hypothesized model

Red: Proposed SOC relationships

Dark Red: Proposed moderation

Green: Proposed relationships related to age and gender

Broader Impacts of the Proposed Research

The interdisciplinary focus of this research has the potential to enhance the scientific knowledge of later life physical activity in leisure sciences, social psychology, gerontology, human development and family studies, and within feminist critiques of gender roles. A better understanding of the proposed relationships might help determine whether or not interventions should emphasize and teach specific strategies for achieving physical activity goals individualized to specific constraints, more general SOC strategies, or both as the preferred method for leisure education to increase physical activity in later life. Additionally, it could help to determine whether or not older men and women need separate or co-participation physical activity education programs and interventions.

Research Design and Methods

This study utilizes a non-experimental survey research design, with its attendant postpositivist epistemological emphasis on theory verification and standardized measurement (Creswell, 2003).

Population and Sampling

One of the primary objectives of this study was to utilize an older adult sample to test relationships that have been supported in previous research with younger samples. Another objective was to determine the role of gender in these relationships. To accomplish these objectives, the target population of this study was males and females ages 50 and older.

Sample size considerations were based on the statistical methods that were planned for the data analyses in this study—multiple regression and structural equation modeling. For

regression, a 10:1 ratio of sample size to tested parameters is recommended (Tabachnik & Fidell, 1996). There were nine parameters in the most complex planned regression analysis used in this study, suggesting a minimum sample size of ninety. For structural equation modeling (SEM), a general rule of thumb is 15 participants per observed variable (The University of Texas at Austin Information Technology Services, 2002). There were 17 observed variables in the most complex planned SEM analysis, which would require a sample size of 255, a sample deemed “large” by Kline (2005). Accounting for the possibility of 20% unusable (MNAR: missing not at random) data, the minimum survey distribution for this study was 325 males and females ages 50 and older. The sample comprised individuals involved in the Cleveland Metroparks park and zoo volunteer programs as well as general public park users at visitor centers and two special events. The sample was chosen because the majority of respondents were expected to fall within the target age range and to represent a range of physical activity levels.

Pilot Test

Prior to data collection, the survey instrument was pilot tested with a focus group of two males and two females aged 50 and older. As all of the instruments in the present study have been validated previously, the intent of the focus group was to obtain feedback on survey readability. Modifications of the survey instrument were made accordingly. Based on the feedback, the following modifications were made: 1) adding more skip options; 2) omitting the definitions for light, moderate and strenuous activity from the questions on leisure-time physical activity; 3) modifying the instructions for the SOC instrument to allow respondents to skip both options if neither were applicable; and 4) adding a “does not apply” option for the negotiation scale items.

Data Collection: Self-Administered Questionnaires

In the Fall of 2005, approximately 500 Cleveland Metroparks' volunteers 50 and older received a postcard and/or an e-mail (Dillman, 1999) announcing the study and the location/dates of sessions held at the following locations: 1) four Park District visitor centers, 2) two special events for the general public, and 3) the Cleveland Metroparks Zoo September volunteer meeting at the zoo park administration building. As an incentive to participate, study participants were entered into a raffle for two free movie tickets, a gift certificate for a local restaurant, and a gift certificate for a local book seller. General public visitors 50 and older present at the visitor centers and special events were asked to complete questionnaires as well. Park visitors were recruited through banners that were posted on the research booth and/or the entryways at the park district data collection sites that advertised a study of people aged 50 and older and the chance to win raffle prizes. Some park visitors were recruited for the study through word of mouth at the special events or through spouses who were park volunteers.

Participants completed self-administered questionnaires on-site. Participants were given a verbal description of the general study purpose and encouraged to seek clarification about the questions. All participants were given a copy of the study purpose, which included contact information for questions and comments, the questionnaire, the raffle form, and a form to complete if they were interested in participating in future research projects. Although participants were asked to complete the questionnaire on-site, if requested, participants were allowed to complete the questionnaire at a later date and to return it via postage-paid, return addressed envelopes. Three hundred thirty-nine questionnaires were distributed, with two hundred and seventy-five completed, resulting in a response rate of eighty-one percent.

The Survey Instrument

The instrument (see Appendix) included measures of physical activity, SOC, leisure constraints, and negotiation strategies. The instrument also included questions related to age, gender, and motivation. The survey had two tear off contact sheets: 1) to be entered into a contest for raffle prizes, and 2) to participate in a future research study.

Physical Activity Participation.

An introductory paragraph about free time recreation, sport and fitness activities and a modified list of physical activities from the Historical Leisure Activity Questionnaire (Kriska et al., 1990) were provided to introduce the questions about physical activity. The Leisure Time Activity subscale of the Physical Activity Scale for the Elderly (PASE) (New England Research Institutes, Inc., 1991) was used to assess respondents' physical activity in the past seven days. This subscale has a question series for each of four physical activity *intensity* levels—light, moderate, strenuous, and muscle strength. Each of these series of questions included items on *frequency* (4-point ordinal scale of the number of days) and *duration* (4-point ordinal scale of hours) of physical activity as well as on the *type* of activity (e.g., swimming, walking, golfing, etc.). In this study, an additional question was added to each series on *where* the respondents participate in leisure-time physical activities. Based on the U.S. government's leisure-time physical activity classifications (CDC, 1997), the Leisure Time Activity subscale was modified so that respondents could indicate walking and gardening/yard work within the question series for the four leisure-time physical activity intensity levels. In the original PASE, walking is a separate Leisure Time Activity item without intensity information and gardening/yard work are listed under the Household Activity subscale.

The PASE scoring protocol was used to compute an overall leisure-time physical activity score. More specifically, frequency (days) and duration (hours) were converted into an hours per day score and then weighted according to intensity level. The resulting value reflects a weighted sum score for overall leisure-time physical activity across frequency, duration and intensity. In addition, sum scores were calculated for frequency (0-12; zero indicated no days of participation in the past 7 days) and duration (0-16; zero indicated no hours) across the four intensity levels.

Washburn, Smith, Jette, and Janney (1993) found that the test-retest reliability of the PASE scale, including the leisure-time subscale, was .75. Other studies have validated the PASE with sedentary adults (Washburn et al., 1999), older adults with disabilities (Martin et al., 1999), and with objective measures of physical activity (Washburn & Ficker, 1999).

Selection, Optimization, and Compensation.

The Short Version of the SOC Questionnaire (Baltes, Baltes, Freund, & Lang, 1995) was used to assess the selection, optimization, and compensation strategies of participants. This questionnaire contains 24 statements, with 12 target items representing selection, optimization, and compensation strategies and 12 distractor items. The questionnaire was modified from a Person A/Person B format to an either/or statement pair format. Participants were asked to select which of the two statements (target or distractor) described them better, and were instructed to go to the next statement pair if neither statement applied to them. Responses were coded as (1) SOC (SOC selected or both SOC and distractor selected) and (0) not SOC (distractor selected or neither statement selected). The number of affirmative responses to the target items indicated the respondent's composite score from zero to twelve. Two cases were not ascertained for the twelve statement pairs; the number associated with the paired statements was selected rather than

one of the two paired statements, making it impossible to discern which statement was intended. As a result, the scores for these two cases were considered missing.

This questionnaire has satisfactory reliability, with one-month test-retest correlations for each component ranging from .56 to .75 (Freund & Baltes, 1998). The Short Version questionnaire has been validated, with SOC significantly related to several indicators of successful aging—satisfaction with aging, lack of agitation, emotional loneliness, and social loneliness—even after controlling for personal life investment, neuroticism, extroversion, openness, control beliefs, intelligence, subjective health, and age. These associations were positive and moderate, from .14 to .17 (Freund & Baltes, 1998).

Leisure Constraint and Negotiation Strategies.

To measure leisure constraints, the Hubbard and Mannell (2001) Leisure Constraint Scale was modified by omitting items referencing workplace exercise programs and by adding specific items related to subjective physical health status. Constraint domains included intrapersonal, interpersonal, and structural. Following Alexandris et al. (2003), an item to assess fear of getting hurt (“Afraid of getting hurt”) as well as an item to assess subjective physical health status (“I am in poor health”) were added. Hubbard and Mannell’s (2001) Leisure Constraint Scale has adequate reliability, with a coefficient alpha of .72 for the full scale.

To measure negotiation strategies, Hubbard and Mannell’s (2001) Negotiation Strategies Scale was modified for consistency with the physical activity terminology used in the PASE questions and by omitting three items referencing workplace exercise programs. Negotiation domains include time management, skill acquisition, interpersonal coordination, and financial management. Some examples of items are, “I get up earlier or stay up later to increase fitness and recreation time,” “I learn new activities,” and “I try to budget my money.” Hubbard and

Mannell's (2001) Negotiation Strategies Scale has good reliability, with a coefficient alpha of .89 for the full scale.

Motivation for General Leisure-Time Physical Activity.

Two motivation items from Hubbard and Mannell (2001) were modified for consistency with the PASE wording: "I participate or would like to participate in recreation, sport or fitness activity for my own immediate enjoyment or pleasure," and, "I participate or would like to participate in a recreation, sport or fitness activity because it is good for my health." The response options ranged from "Not at All" (1) to "Very Much" (5). These two items were combined to form a sum score.

The survey also included one additional instrument, the Exercise Identity Questionnaire (Anderson & Cychosz, 1994), which will be used for future research study (see Appendix).

Data Analysis

Multiple regression analysis and structural equation modeling (SEM) were used to address the guiding research questions and hypotheses. One advantage of SEM is that it allows researchers to test hypotheses at a higher level of abstraction than is possible using multiple regression or ANOVA (Kline, 2005). It also provides increased explanatory power, controls for measurement error, and has more indicators of goodness of fit than the ordinary least squares statistical method.

Elective-based selection, loss-based selection, optimization, and compensation were the four observed variables for the latent variable, SOC. Intrapersonal, interpersonal, and structural constraints were the three observed variables of constraint. Time, skill, social, and financial

resources were the four observed variables reflecting negotiation strategies. Enjoyment and health were the two observed variables of motivation.

References

- Aitchison, C. C. (2003). *Gender and leisure: Social and cultural perspectives*. London: Routledge.
- Alexandris, K., & Carroll, B. (1997). An analysis of leisure constraints based on different recreational sport participation levels: Results from a study in Greece. *Leisure Sciences, 19*, 1-15.
- Alexandris, K., Barkoukis, V., Tsorbatzoudis, H., & Groulos, G. (2003). A study of perceived constraints on a community based physical activity program for the elderly in Greece. *Journal of Aging and Physical Activity, 11*(3), 305-318.
- Alexandris, K., Tsorbatzoudis, C., & Grouios, G. (2002). Perceived constraints on recreational sport participation: Investigating their relationship with intrinsic motivation, extrinsic motivation and Amotivation. *Journal of Leisure Research, 34*(3), 233-252.
- Altergott, K., & McCreehy, C. C. (1993). Gender and family status across the life course. Constraints on five types of leisure. *Society and Leisure, 16*(1), 151-180.
- Anderson, D. F., & Cychosz, C. M. (1994). Development of an exercise identity scale. *Perceptual and Motor Skills, 78*, 747-751.
- Antonucci, T. C., Akiyama, H., Takahashi, K. (2004). Attachment and close relationships across the life span. *Attachment and Human Development, 6*(4), 353-370.
- Baltes, M. M., & Carstensen, L. L. (1996). The process of successful ageing. *Ageing and Society, 16*, 397-422.
- Baltes, M. M., & Carstensen, L. L. (1999). Social-psychological theories and their applications to aging: From individual to collective. V. L. Bengtson & K. W. Schaie (Eds.), *Handbook of theories of aging* (pp. 209-226). New York: Springer.

- Baltes, M. M., & Carstensen, L. L. (2003). The process of successful aging: Selection, optimization, and compensation. In U. M. Staudinger & U. Linderberger (Eds.), *Understanding human development: Dialogues with lifespan psychology* (pp. 81-104). New York: Kluwer.
- Baltes, P. B. (1997). On the incomplete architecture of human ontogeny: Selection, optimization, and compensation as foundation of developmental theory. *American Psychologist*, 52(4), 366-380.
- Baltes, P. B., & Baltes, M. M. (1990). Psychological perspectives on successful aging: The model of selective optimization with compensation. In P. B. Baltes & M. M. Baltes (Eds.), *Successful aging: Perspectives from the behavioral sciences* (pp. 1-34). New York: Cambridge University Press.
- Baltes, P. B., Baltes, M. M., Freund, A. M., & Lang, F. R. (1995). *Measurement of selective optimization with compensation by questionnaire*. Berlin: Max Planck Institute for Human Development.
- Berscheid, E. (1994). Interpersonal relationships. *Annual Review of Psychology*, 45, 79-129.
- Bialeschki, M. D., & Henderson, K. A. (1988). Constraints to trail use. *Journal of Park and Recreation Administration*, 6, 20-28.
- Bordens, K. S., & Horowitz, I. W. (2002). *Social psychology* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum.
- Burnett-Wolle, S., & Godbey, G. (2004). Leading theories on aging: Revolutionary implications for leisure research. Manuscript submitted for publication.
- Carroll, B., & Alexandris, K. (1997). Perception of constraints and strength of motivation:

- Their relationship to recreational sport participation in Greece. *Journal of Leisure Research*, 29(3), 279-299.
- Centers for Disease Control and Prevention. (1997). Monthly estimates of leisure-time physical inactivity—United States, 1994. Retrieved April 3, 2006, from <http://www.cdc.gov/mmwr/preview/mmwrhtml/00047596.htm>
- Centers for Disease Control and Prevention. (2000a). Behavioral Risk Factor Surveillance System (BRFSS). Retrieved March 22, 2005, from <http://apps.nccd.cdc.gov/dnpa/piRec.asp?piState=us&PiStateSubmit=Get+Stats>
- Centers for Disease Control and Prevention. (2000b). Behavioral Risk Factor Surveillance System (BRFSS). Retrieved March 22, 2005, from <http://www.cdc.gov/nccdphp/dnpa/physical/stats/tainacage.htm>
- Coleman, D., & Iso-Ahola, S.E. (1993). Leisure and health: The role of social support and self-determination. *Journal of Leisure Research*, 25(2), 111-128.
- Crawford, D., Jackson, E., & Godbey, G. (1991). A hierarchical model of leisure constraints. *Leisure Sciences*, 13, 309-320.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methodology Approaches* (Second ed.). Thousand Oaks, CA: Sage.
- Dillman, D. A. (1999). *Mail and internet surveys: The tailored design method* (2nd ed.). New York, NY: John Wiley Company.
- Eagly, A. H. (1987). *Sex differences in social behavior: A social role interpretation*. Hillsdale, NJ: Erlbaum.
- Elder, G. H., Jr. (1995). The life course paradigm. In P. Moen, G. H. Elder, Jr., & K. Lüscher

- (Eds.), *Examining lives in context: Perspectives on the ecology of human development*, pp. 101-139. Washington DC: American Psychological Association.
- Elder, G. H., Jr. (2000). The life course. In E. F. Borgatta & R. J. V. Montgomery (Eds.), *Encyclopedia of Sociology* (2nd ed.), pp. 1614-1622. New York: Macmillan.
- Elder, G. H., Jr., & Johnson, M. K. (2003). The life course and aging: Challenges, lessons, and new directions. In R. A. Settersten, Jr. (Ed.), *Invitation to the life course: Toward new understandings of later life*, pp. 49-81. Amityville NY: Baywood.
- Elder, G. H., Johnson, M. K., & Crosnoe, R. (2003). The emergence and development of life course theory. In J.T. Mortimer & M. Shanahan (Eds.), *Handbook of the life course* (pp. 3-19). New York: Kluwer Academic/Plenum.
- Farbrigoule, C., Letenneur, L., & Dartigues, J.F. (1995). Social and leisure activities and risk of dementia: A prospective longitudinal study. *Journal of the American Geriatric Society*, 43, 485-490.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.
- Freund, A. M., & Baltes, P. B. (1998). Selection, optimization, and compensation as strategies of life management: Correlations with subjective indicators of successful aging. *Psychology and Aging*, 13(4), 531-543.
- Freund, A. M., & Baltes, P. B. (2002). Life-management strategies of selection, optimization, and compensation: Measurement by self-report and construct validity. *Journal of Personality and Social Psychology*, 82(4), 642-662.
- Haggard, L. M. & Williams, D. R. (1992). Self-identity benefits of leisure activities. In B. L.

- Driver, P. J. Brown, & G. L. Peterson (Eds.), *Benefits of leisure* (pp. 103-119). State College, PA: Venture.
- Han, S-K., & Moen, P. (1999). Work and family over time: A life course approach. *The Annals of the American Academy of Political and Social Sciences*, 562, 98-110.
- Henderson, K. A., Bialeschki, M. D., Shaw, S. M., & Freysinger, V. J. (1996). *Both gains and gaps: Feminist perspectives on women's leisure*. State College, PA: Venture.
- Hubbard, J., & Mannell, R. (2001). Testing competing models of the leisure constraint and negotiation process in a corporate employee recreation setting. *Leisure Sciences*, 23, 145-163.
- Iso-Ahola, S. E. (1980). *The social psychology of leisure and recreation*. Dubuque, IA: Brown.
- Jackson, E. L. (1993). Recognizing patterns of leisure constraints: Results from alternative analyses. *Journal of Leisure Research*, 25, 129-149.
- Jackson, E. L., & Henderson, K. A. (1995). Gender-based analysis of leisure constraints. *Leisure Sciences*, 17(1), 31-51.
- Jackson, E. L., Crawford, D. W., & Godbey, G. (1993). Negotiation of leisure constraints. *Leisure Sciences*, 15, 1-11.
- Janke, M. C., & Davey, A. (2004). Selective optimization with compensation in the leisure patterns of older adults. *Gerontologist*, 44(1), 321.
- Kay, T., & Jackson, E. (1991). Leisure despite constraint: The impact of leisure constraints on leisure participation. *Journal of Leisure Research*, 23, 301-313.
- Kelly, J. R. (1983). *Leisure identities and interactions*. London, UK: Allen and Unwin.
- Kleiber, D. A., & Hemmer, J. D. (1981). Sex differences in the relationship of locus of control and recreational sport participation. *Sex Roles*, 7, 801-810.

- Kleiber, D. A., & Kelly, J. R. (1980). Leisure, socialization and the life cycle. In S. E. Iso-Ahola (Ed.), *Social psychological perspectives on leisure and recreation* (pp. 91-137). Springfield, IL: Charles C. Thomas.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: The Guilford Press.
- Kluge, M. A. (2002). Understanding the essence of a physically active lifestyle: A phenomenological study of women 65 and older. *Journal of Aging and Physical Activity*, *10*(1), 4-27.
- Kriska, A. M., Knowler, R. E., LaPorte, R. E., Drash, A. L., Wing, R. R., Blair, S. N., et al. (1990). Development of a questionnaire to examine the relationship of physical activity and diabetes in Pima Indians. *Diabetes Care*, *13*, 401-411.
- Kujala, U. M. (2004). Evidence for exercise therapy in the treatment of chronic disease based on at least three randomized controlled trials: Summary of published systematic reviews. *Scandinavian Journal of Medicine & Science in Sports*, *14*(6), 339-345.
- Kull, M. (2002). The relationships between physical activity, health status and psychological well-being of fertility-aged women. *Scandinavian Journal of Medicine and Science in Sports*, *12*, 241-247.
- Lang, F. R., Rieckmann, N., & Baltes, M. M. (2002). Adapting to aging losses: Do resources facilitate strategies of selection, compensation, and optimization in everyday functioning? *Journal of Gerontology: Psychological Sciences*, *57B*(6), P501-509.
- Larson, R. W., & Kleiber, D. A. (1993). Structured leisure as a context for the development of attention during adolescence. *Society and Leisure*, *16*, 77-98.
- Lawton, M. P. (1989). Environmental proactivity and affect in older people. In S. Spacapan &

- S. Oskamp (Eds.), *Social psychology of aging* (pp. 135-164). Newsbury Park, CA: Sage.
- Lee, Y. (2003). Gender difference in physical activity among older adults. *Gerontologist*, 43(Special Issue 1): 477-478.
- Lounsbury, J. W., & Polik, J. R. (1992). Leisure needs and vacation satisfaction. *Leisure Sciences*, 14, 105-119.
- Mannell, R. C., & Bradley, W. (1986). Does greater freedom always lead to greater leisure? Testing a person x environment model of freedom and leisure. *Journal of Leisure Research*, 18, 215-230.
- Mannell, R. C., Kleiber, D. A. (1997). *A social psychology of leisure*. State College, PA: Venture.
- Mannell, R. C., & Zuzanek, J. (1991). The nature and variability of leisure constraints in daily life: The case of the physically active leisure of older adults. *Leisure Sciences*, 13, 337-351.
- Mannell, R. C., Zuzanek, J., & Larson, R. W. (1988). Leisure states and "flow" experiences: Testing perceived freedom and intrinsic motivation hypotheses. *Journal of Leisure Research*, 20, 289-304.
- Martin, K. A., Rejeski, W. J., Miller, M. E., James, M. K., Ettinger, Jr., W. H., & Messier, S. P. (1999). Validation of the PASE in older adults with knee pain and physical disability. *Medicine & Science in Sports & Exercise*, 31(5), 627-633.
- Mathieu, M. (1999). The Surgeon General's report and leisure services for older adults. *Journal of Physical Education, Recreation & Dance*, 70(3), 28-31.
- McAuley, E. (1991). Understanding exercise behavior: A self-efficacy perspective. In G. C.

- Roberts (Ed.), *Understanding motivation in sport and exercise* (pp. 107-127).
Champaign, IL: Human Kinetics.
- McAuley, E. (1992). The role of efficacy cognitions in the prediction of exercise behavior in middle-aged adults. *Journal of Behavioral Medicine, 15*(1), 65-88.
- McAuley, E., Jerome, G. J., Marquez, D. X., Elavsky, S., & Blissmer, B. (2003). Exercise self-efficacy in older adults: Social, affective, and behavioral influences. *Annals of Behavioral Medicine, 25*(1), 1-7.
- McGuire, F. A., Boyd, R. K., & Tedrick, R. E. (2004). *Leisure and aging: Ulyssean living in later life* (3rd ed.). Champaign, IL: Sagamore.
- McGuire, F. A., Dottavio, F. D., & O'Leary, J. T. (1986). Constraints to participation in outdoor recreation across the life span: A nationwide study of limitors and prohibitors. *The Gerontologist, 26*(5), 538-544.
- Moen, P. (2001). The gendered life course. In R. H. Binstock & L. K. George (Eds.), *Handbook of aging and the social sciences* (5th ed.) (pp. 179-196). New York: Academic Press.
- Moen, P., Robinson, J., & Dempster-McClain, D. (1995). Caregiving and women's well-being: A life course approach. *The Journal of Health and Human Behavior, 36*, 259-273.
- Moen, P., Robinson, J., & Fields, V. (1994). Women's work and caregiving roles: A life course approach. *Journal of Gerontology: Social Sciences, 49*, S176-S186.
- Moen, P., Fields, V., Quick, H. E., & Hofmeister, H. (2000). A life course approach to retirement and social integration. In K. Pillemer, P. Moen, N. Glasgow, & E. Wethington (Eds.), *Social integration in the second half of life* (pp. 75-107). Baltimore, MD: John Hopkins University.

- Murphy, S.L., Williams, C.S., & Thomas, M.G. (2002). Characteristics associated with fear of falling and activity restriction in community-living older persons. *Journal of the American Geriatric Society, 50*, 516-520.
- Myers, D. G. (2001). *Social psychology* (7th ed.). New York, NY: McGraw-Hill.
- New England Research Institutes, Inc. (NERI). (1991). PASE: Physical Activity Scale for the Elderly. Watertown, MA: NERI.
- Nickerson, N. P., & Ellis, G. D. (1991). Traveler types and activation theory: A comparison of two models. *Journal of Travel Research, 29*, 26-31.
- O'Brien Cousins, S. (1997). Elderly tomboys? Sources of self-efficacy for physical activity in late life. *Journal of Aging and Physical Activity, 5*, 229-243.
- O'Brien Cousins, S., & Keating, N. (1995). Life cycle patterns of physical activity among sedentary and active older women. *Journal of Aging and Physical Activity, 3*(4), 340-359.
- Oguma, Y., Sesso, H.D., Paffenbarger, R.S., & Lee, I.M. (2001). Physical activity and all cause mortality in women: A review of the evidence. *British Journal of Sports Medicine, 36*, 162-172.
- Oh, S. S. (2005). *Older adults' selective optimization with compensation in the context of gardening*. Unpublished doctoral dissertation, The Pennsylvania State University, State College.
- Payne, L. L. (1998). *The role of leisure in the relationship between arthritis severity and perceived health among adults 50-85: Does leisure contribute?* Unpublished doctoral dissertation, The Pennsylvania State University, State College.
- Ragheb, M. G., Griffith, C. A., (1982). The contribution of leisure participation and leisure

- satisfaction to life satisfaction of older persons. *Journal of Leisure Research*, 14(4), 295-306.
- Raymore, L., Godbey, G., Crawford, D., & von Eye, A. (1993). Nature and process of leisure constraints: An empirical test. *Leisure Sciences*, 15, 99-113.
- Rhodes, R. E., Martin, A. D., Taunton, J. E., Rhodes, E. C., Donnelly, M., & Elliott, J. (1999). Factors associated with exercise adherence among older adults: An individual perspective. *Sports Medicine*, 28(6), 397-411.
- Riddick, C. C. (1985). Life satisfaction determinants of older males and females. *Leisure Sciences*, 7(1), 47-63.
- Robinson, D. W. (1992). A descriptive model of enduring risk recreation involvement. *Journal of Leisure Research*, 24, 52-63.
- Ryan, E. B., Anas, A. P., Beamer, M., & Bajorek, S. (2003). Coping with age-related vision loss in everyday reading activities. *Educational Gerontology*, 29, 37-54.
- Sallis, J. F., Haskell, W. L., Fortmann, S. P., Vranizan, K. M., Taylor, C. B., & Solomon, D. S. (1986). Predictors of adoption and maintenance of physical activity in a community sample. *Preventive Medicine*, 15, 331-341.
- Samdahl, D. M. (1999). Epistemological and methodological issues in leisure research. In E. L. Jackson & T. L. Burton (Eds.), *Leisure studies: Prospects for the 21st century*, (pp. 119-133). State College, PA: Venture.
- Searle, M., & Jackson, E. (1985). Recreation non-participation and barriers to participation: Considerations for the management of recreation delivery systems. *Journal of Park and Recreation Administration*, 3, 23-35.
- Scott, D. (1991). The problematic nature of participation in contract bridge: A qualitative study

- of group-related constraints. *Leisure Sciences*, 13, 321-336.
- Shaw, S. M. (1999). Gender and leisure. In E. L. Jackson & T. L. Burton (Eds.), *Leisure studies: Prospects for the twenty-first century* (pp.371-383). State College, PA: Venture.
- Shaw, S. M., Bonen, A., & McCabe, J. (1991). Do more constraints mean less leisure? Examining the relationship between constraints and participation. *Journal of Leisure Research*, 23, 286-300.
- Shaw, S. M., Kleiber, D. A., & Caldwell, L. L. (1995). Leisure and identity formation in male and female adolescents: A preliminary examination. *Journal of Leisure Research*, 27(3), 245-263.
- Shephard, R. J. (1997). *Aging, physical activity, and health*. Champaign, IL: Human Kinetics.
- Stanley, D., & Freysinger, V. J. (1995). The impact of age, health, and sex on the frequency of older adults' leisure activity participation: A longitudinal study. *Activities, Adaptation and Aging*, 19(3), 31-42.
- Strain, L.A., Grabusic, C.C., Searle, M.S., & Dunn, N.J. (2002). Continuing and ceasing leisure activities in later life: A longitudinal study. *The Gerontologist*, 42(2), 217-223.
- Tabachnik, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York: Harper Collins.
- The University of Texas at Austin Information Technology Services. (2002). Structural equation modeling using AMOS: An introduction. Retrieved April 13, 2005, from: <http://www.utexas.edu/its/rc/tutorials/stat/amos/#sample%20size>.
- Thibaut, J. W., & Kelley, H. H. (1959). *The social psychology of groups*. New York: Wiley.
- Vertinsky, P. A. (1995). Stereotypes of aging women and exercise: A historical perspective. *Journal of Aging and Physical Activity*, 3(3), 223-237.

- Wankel, L. M., Mummery, W. K., Stephens, T., & Craig, C. L. (1994). Prediction of physical activity intention from social psychological variables: Results from the Campbell's survey of well-being. *Journal of Sport & Exercise Psychology, 16*, 56-69.
- Washburn, R. A., & Ficker, J. L. (1999). Physical Activity Scale for the Elderly (PASE): The relationship with activity measured by portable accelerometer. *Journal of Sports Medicine and Physical Fitness, 39*, 336-340.
- Washburn, R. A., McAuley, E. Katula, J., Mihalko, S. L., & Boileau, R. A. (1999). The Physical Activity Scale for the Elderly (PASE): Evidence for validity. *Journal of Clinical Epidemiology, 52*(7), 643-651.
- Washburn, R. A., Smith, K. W., Jette, A. M., & Janney, C. A. (1993). The physical activity scale for the elderly (PASE): Development and evaluation. *Journal of Clinical Epidemiology, 15*, 3-162.
- Wilcox, S, Bopp, M, Oberrecht, L., Kammermann, S. K., & McElmurray, C. T. (2003). Psychosocial and perceived environmental correlates of physical activity in rural and older African American and white women. *Journals of Gerontology, 58*(6), P329-P337.

Orientation to Chapter 2

Chapter 2 is written as a stand-alone manuscript to be later submitted in consideration for publication in a peer-reviewed journal. In terms of the dissertation research questions and hypotheses, the purpose of Chapter 2 is to investigate the following:

- RQ2. Is motivation positively related to physical activity participation?
- RQ5. Is there an interaction between negotiation and constraints on physical activity participation?
- RQ6. Is there an interaction between motivation and constraints on physical activity participation?
- H5. People with higher levels of constraint will have lower physical activity participation.
- H6. People with higher levels of constraint will have greater use of negotiation strategies.
- H7. Motivation will have an indirect, positive relationship with physical activity through negotiation strategies.

Please note that RQ5 and RQ6 have been simplified, omitting age and gender as control variables, due to a reformulation of the purposes of this study to examine and extend Hubbard and Mannell's (2001) alternative models of the constraint negotiation process. Because the primary goal of this study was to compare patterns of alternative model fit across the two studies, and age and gender were not included in Hubbard and Mannell's empirical models, these factors were not included to examine RQ5 and RQ6 in this study. Instead, the influence of age and gender in the constraint negotiation process in later life are examined in Chapter 3.

CHAPTER 2

TESTING LEISURE CONSTRAINT NEGOTIATION MODELS

WITH AN OLDER SAMPLE IN A METROPOLITAN PARK SETTING

Abstract

The purpose of this study was to test Hubbard and Mannell's (2001) models of the leisure constraint negotiation process. One objective of this study was to utilize a multidimensional measure of physically active leisure in an attempt to replicate their findings with an older sample in a metropolitan park setting. In addition to testing their four models, another objective was to test a fifth model of the constraint negotiation process, the "balance" model. Middle-aged and older adult (50 and older) volunteers of and visitors to a park district in a Midwestern metropolitan city were asked to complete a self-administered questionnaire. A two-step modeling procedure was used, in which the measurement model was tested and respecified prior to testing the alternative structural models. After trimming the structural models and assessing the model fit indices, an alternative model was proposed, the *constraint-negotiation dual channel model*. This model suggests that constraints and negotiation work independently and in opposite directions to influence physically active leisure in later life; constraints had a negative influence whereas negotiation had a positive influence on participation. Similar to Hubbard and Mannell's findings, negotiation fully mediated the relationship between motivation and participation in this study. The implications of these findings for the study of constraint negotiation processes and for active leisure in later life, as well as suggestions for future model testing, are discussed.

Introduction

Negotiation and motivation have been provided as explanations as to why constraints do not necessarily reduce, let alone preclude, leisure participation (Hubbard & Mannell, 2001; Jackson, Crawford, & Godbey, 1993). Even so, few studies have attempted to empirically test the relationships between negotiation, motivation, constraints, and leisure participation. One exception is Hubbard and Mannell's (2001) empirical test of competing process models of constraint negotiation. They tested four models with a sample of employees with access to employer-provided indoor fitness centers, relying upon information on the frequency of participation in the past year. However, in their conclusionary remarks they also emphasized the importance of examining these models with other populations and activities. The aim of the current study was to test Hubbard and Mannell's four models as well as an additional model based on Jackson et al.'s (1993) "balance proposition" in an attempt to replicate and extend their findings. To assess the generalizability of their results, we utilized a different age sample (an older versus younger adult demographic), in a different recreation setting (a metropolitan park district versus a corporate employee indoor fitness center), and with a multidimensional measurement of physically active leisure (including frequency, duration and intensity information).

Leisure Constraint Negotiation

Leisure constraints are factors that preclude—or, at a minimum, limit—participation in desired leisure activities (Crawford & Godbey, 1987; Crawford, Jackson, & Godbey, 1991). Crawford et al. (1991) developed a hierarchical model of intrapersonal, interpersonal, and structural constraints. Intrapersonal constraints are within the individual, such as shyness, poor

health, and lack of skill. Interpersonal constraints pertain to social interactions, such as the conflicting schedules or family obligations of potential activity partners. Structural constraints are features of the environment, such as inconvenient facilities, time limitations, and lack of low-cost options. According to the hierarchical model of constraints, intrapersonal constraints (proximal process) are encountered and negotiated prior to interpersonal constraints (medial process), which in turn are negotiated prior to structural constraints (distal process). This conceptualization provided the first articulation of the constraint negotiation proximal-distal process, whereby constraints are overcome through active negotiation by the individual. Jackson et al. (1993) provided further elaboration of this hierarchical model, with an emphasis on the level of participation rather than participation versus nonparticipation, a distinction supported by research indicating that constraint negotiation is linked to participation in diverse leisure settings (Kay & Jackson, 1991; Scott, 1991; Shaw, Bonen, & McCabe, 1991). Jackson et al. (1993) provided propositions about the possible relationships between constraints, negotiation, and motivation, which have informed recent research on leisure participation, particularly research pertaining to negotiation strategies (see Frederick & Shaw, 1995; Henderson, Bedini, Hecht, & Schuler, 1995; Hubbard and Mannell, 2001; Jackson & Rucks, 1995).

Leisure Constraint Negotiation Models

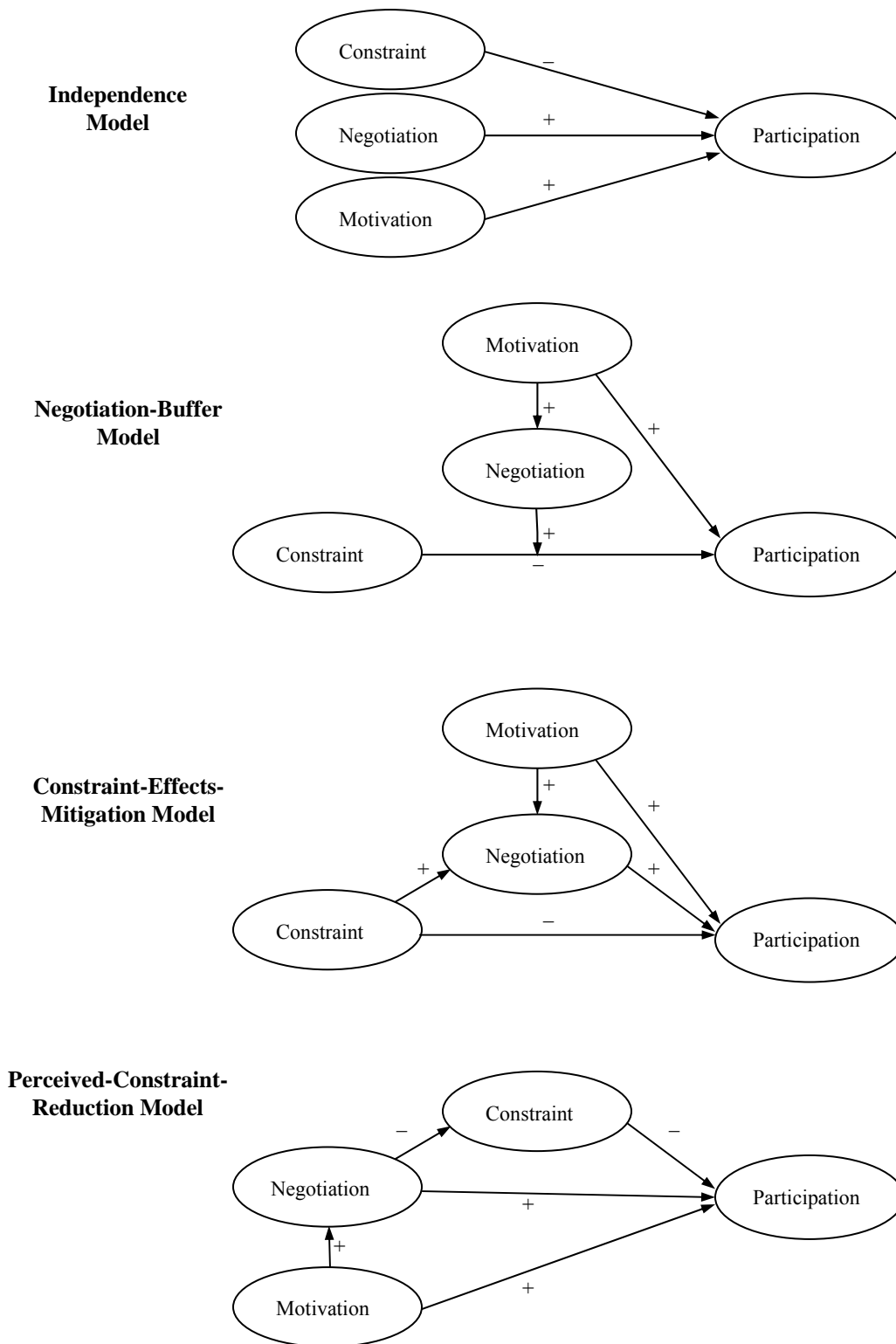
In one recent study, Hubbard and Mannell (2001) tested four plausible, alternative models of the relationships of constraints, negotiation and motivation on physically active leisure: the *independence model*, the *negotiation-buffer model*, the *constraint-effects-mitigation model*, and the *perceived-constraint-reduction model*. Before describing each of these models in turn, it may be worthwhile to describe the constraint and negotiation scales they used, as

relatively little empirical work has been done on the development of scales to measure these constructs. To assess constraints, Hubbard and Mannell expanded Raymore, Godbey, Crawford and von Eye's (1993) hierarchical constraints scale, which operationalizes intrapersonal, interpersonal and structural constraints. Hubbard and Mannell added items that pertained to workplace constraints, such as having different work schedules from others and being too busy with physical activities outside of work. They also included some new intrapersonal, interpersonal, and structural constraint items. Additional intrapersonal constraints items included not being in good enough shape, not having the energy to participate, and lack of comfort participating with people who are older and younger. An additional interpersonal constraint item was having friends or acquaintances with whom to participate whereas additional structural constraint items were not having the right clothes or equipment and having a disability that precluded participation.

To assess negotiation strategies, they developed a scale based on an operationalization of four primary types of negotiation: time management, skill acquisition, financial strategies, and interpersonal coordination. A time management strategy might entail substituting a desired activity with a more convenient or a less time intensive activity whereas a skill acquisition strategy might be taking lessons. A financial strategy might involve saving money to do desired activities whereas an interpersonal strategy might be trying to meet people with similar leisure interests.

Their *independence model* suggested that constraints, negotiation and motivation have independent effects on participation, with no proposed relationships between these three factors. In their *negotiation-buffer model*, they suggested that negotiation would have a positive, moderating influence on the negative effect of constraints on participation. In addition to a direct

FIGURE 2.1 Hubbard and Mannell's (2001) four hypothesized models of the constraint negotiation process.



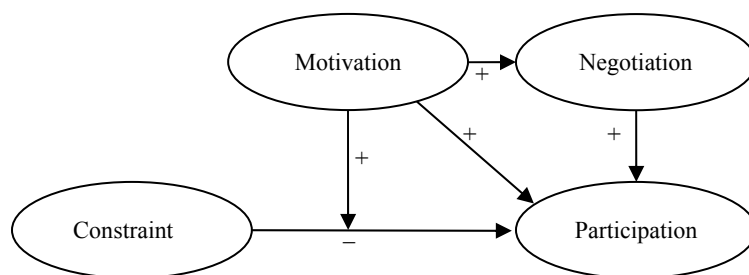
effect of motivation on participation, they also proposed that motivation would have a positive effect on negotiation. In their *constraint-effects-mitigation model*, they proposed that the more constraints one has, the more one utilizes negotiation strategies, which in turn positively influences participation levels. However, they proposed that negotiation only partially mediates this relationship; constraint also has a negative direct effect on participation. In this model, negotiation was also hypothesized to partially mediate the relationship between motivation and participation. In their final model, the *perceived-constraint-reduction model*, they hypothesized the same relationships for motivation as in the constraint-effects-mitigation model; negotiation partially explains its effects on participation. However, in contrast to the constraint-effects-mitigation model, they proposed that negotiation decreases constraint levels, thereby assuaging some of the negative influence of constraint on participation. Figure 2.1 illustrates Hubbard and Mannell's (2001) four hypothesized models.

Hubbard and Mannell found support for the *constraint-effects-mitigation model*, which suggests that there is a counteracting process that occurs in the presence of constraints. Although constraints negatively influence participation they also positively influence the utilization of negotiation strategies. In effect, there is some mitigation of the negative effects of constraints on participation through negotiation strategies. Hubbard and Mannell's results provided support for the notion that people with more constraints may still participate, and may actually participate more than, people with fewer constraints (see Kay & Jackson, 1991; Shaw et al., 1991). They also found support for an indirect effect of motivation on participation through negotiation strategies. In sum, negotiation strategies fully mediated the effect of motivation and partially mediated the effect of constraints on physically active leisure participation. These results suggest that the negotiation process is a crucial component of leisure participation.

The Balance Proposition and Alternative Model Extension

Aside from Hubbard and Mannell's (2001) proposition that motivation influences negotiation which, in turn, mediates the relationship between constraints and participation, there is a dearth of research on the role of motivation in the constraint negotiation process. Although motivation has been linked to constraints (Carroll & Alexandris, 1997) and has been identified by researchers as an important component in the negotiation of leisure constraints (Jackson et al., 1993; Mannell & Loucks-Atkinson, 2005), there has not been an empirical test of Jackson et al.'s "balance" proposition. Therefore, in this study, an additional model is tested based on this proposition. In this model, called the *motivation-balance model*, motivation moderates the relationship between constraints and participation: higher motivation levels are expected to reduce the negative impact of constraint on participation. Additionally, similar to the *constraint-effects-mitigation* and *perceived-constraint-reduction models*, the *motivation-balance model* proposes that negotiation mediates the relationship between motivation and participation: higher motivation levels are expected to increase the utilization of negotiation strategies thereby having a positive impact on participation. Motivation is also expected to have a direct effect on participation. Hence, the *motivation-balance model* hypothesizes that motivation influences all of the other model factors. Figure 2.2 depicts this model.

FIGURE 2.2 The motivation-balance model: A hypothesized model of the constraint negotiation process based on the relationships proposed to exist between constraint, negotiation, motivation, and participation.



The Constraint Negotiation Process and Age

Leisure researchers (Jackson, 2000; Mannell & Kleiber, 1997) have suggested that research should continue to include sociodemographic factors such as age in the study of leisure experiences, leisure behaviors, and leisure constraints. More specifically, research in leisure sciences, as well as other disciplines, supports the call for research to assess the role of age in leisure participation. For example, Alexandris et al. (2003) examined the constraints to participation of Greek older adults in a community-based physically active leisure program, finding that constraints predicted a significant proportion of the variance (40%) in older adults' intentions to participate. Intrapersonal constraints (i.e., tired, lack of confidence, fear of getting hurt, and poor fitness) and structural constraints (i.e., access and finances) were the most influential predictors, respectively. Moreover, they found that infrequent participants reported higher levels of constraints than frequent participants, with the most significant differences in intrapersonal constraints. Other studies have also highlighted the role of age on participation. Stanley and Freysinger (1995) found that age was related to declines in sports participation and Shaw, Bonen, and McCabe (1991) found that age accounted for eight percent of the variance in physically active leisure. In addition, Wilcox and colleagues (Wilcox et al., 2000; Wilcox et al., 2003) found that older age was negatively associated with participation in physically active leisure for older women. Further, evidence that most life management strategies for successful adaptation to age-related losses are highest for middle-aged adults (Freund & Baltes, 2002) suggests that negotiation may be even more relevant for this age group. However, no studies have examined the constraint negotiation process—the relationships between constraints, negotiation, motivation and participation—in later life.

Study Purpose, Research Objectives and Research Questions and Hypotheses

The purpose of this study was to test and extend Hubbard and Mannell's (2001) empirical models of the constraint negotiation process. The primary objective of this study was to utilize a multidimensional measure of physically active leisure in an attempt to replicate their findings with an older sample in a metropolitan park setting. In addition to testing Hubbard and Mannell's four alternative models, one further objective of this study was to test an additional model based on Jackson et al's (1993) "balance" proposition. Although Hubbard and Mannell discussed this possible empirical relationship, they did not propose a model to describe the motivation-constraint interaction in the context of negotiation and participation.

There has been relatively little research on the various aspects of the constraint negotiation process for older adults and, to date, there has been no testing of the constraint negotiation model with older samples. Because people aged 50 and older as a group have the lowest rates of leisure-time physical activity in the United States compared to younger age groups (Centers for Disease Control: CDC, 2005), it is possible that the constraint negotiation process may be different for them. This study aims to determine whether or not Hubbard and Mannell's models may be applicable to middle-aged and older adults and, in particular, whether or not the *constraint-effects-mitigation model* maintains the highest level of support with an older sample. Further, it was deemed relevant to test these empirical models beyond participants of corporate employee indoor fitness centers, which likely represent a small proportion of the overall physically active leisure in which people 50 and older engage. In an attempt to procure representation in a more diverse range of leisure activities, in addition to indoor fitness activities, we conducted this study at a metropolitan park district with park visitors and park volunteers. In an extension of previous literature on physically active leisure, this study also employed a

measure that was designed to tap the multidimensional nature of physically active leisure— frequency, duration and intensity. Most studies on physically active leisure have utilized unidimensional measures of active leisure; typically, the frequency of participation in the past year, month, or week (Alexandris & Carroll, 1997; Alexandris et al., 2003; Hubbard & Mannell, 2001) or the duration of participation (Mannell & Zuzanek, 1991) (see Shaw et al., 1991, as an exception). Multidimensional measures of physically active leisure may provide a more valid representation of participation than might a unidimensional measure by including the multiple domains that have been considered relevant in the study of physical activity (Courneya & McAuley, 1994; Skelton & Beyer, 2003).

Research Questions and Hypotheses

There were three research questions that were tested in this study: 1) Is motivation positively related to a multidimensional measure of physical activity participation?; 2) Is there an interaction between negotiation and constraints on physical activity participation? (i.e., the buffer proposition); and 3) Is there an interaction between motivation and constraints on physical activity participation? (i.e., the balance proposition).

In addition, there were three hypotheses based on Hubbard and Mannell's (2001) findings that were tested in this study: 1) People with higher levels of constraint will have lower physical activity participation; 2) People with higher levels of constraint will have greater use of negotiation strategies; and 3) Motivation will have an indirect, positive relationship with physical activity through negotiation strategies.

Methods

Respondents and Procedure

Two-hundred seventy-one volunteers and visitors of a park district in a Midwestern metropolitan city aged fifty and older comprised the study sample. This age group was chosen because there is little research on the constraint negotiation process for physically active leisure in later life. Volunteers were targeted for study inclusion because the park district wanted to learn more about its older volunteers and their participation in physically active leisure.

Individuals were asked to complete on-site self-administered questionnaires in September, 2005, during two community-wide, free special events held by the park district as well as during volunteer sessions with park volunteers at five park district offices/centers. The special event study sites were chosen because they were popular with and well-attended by middle-aged and older adults in previous years. The volunteer sessions were held at the park district offices, which were convenient for and well-known to the older park volunteers. Respondents were unpaid volunteers but were offered incentives to participate such as complimentary refreshments, door prizes (food baskets), and raffle prizes (restaurant, book store, and movie gift certificates). Respondents on-site were given the option to take the questionnaire home and to return it via a postage-paid return addressed envelope. Questionnaires were also left at the park district offices for potential respondents to complete and return via mail. Of the 339 questionnaires that were distributed, 275 usable questionnaires were returned, with a response rate of eight-one percent. Of these 275, 4 were omitted because of outlier physical activity scores, resulting in a total sample of 271.

Measures

The independent variables of interest in this study were leisure constraints, negotiation, and motivation. The dependent variable was physically active leisure participation.

Constraints. Constraints were measured using a modified version of the Hubbard and Mannell (2001) Leisure Constraint Scale, omitting items referencing workplace exercise programs and adding items on fear of getting hurt (Alexandris et al., 2003) and poor health (Shaw et al., 1991). The constraints sub-domains are intrapersonal, interpersonal, and structural constraints. Some examples of items are, “I don’t have the energy to participate” (intrapersonal constraint), “The people I know usually don’t have time to start an activity with me” (interpersonal constraint), and “I would do an activity if the facilities I need are not crowded” (structural constraint). Response options were strongly disagree (1) to strongly agree (5). Hubbard and Mannell (2001) found that the 32-item Constraints Scale had acceptable reliability, with a coefficient alpha of .72.

Negotiation. Negotiation strategies were measured using the Hubbard and Mannell (2001) Negotiation Strategies Scale, modified for consistency with the physical activity terminology used in the Physical Activity Scale for the Elderly (PASE) questions, and with three workplace items omitted. The negotiation strategy sub-domains are time management, financial management, skill acquisition, and interpersonal coordination. Some examples of items are, “I try to be organized” (time management), “I try to budget my money” (financial management), “I try to improve my skills” (skill acquisition), and “I arrange rides with friends” (interpersonal coordination). The response options were modified for consistency with the physical activity response options: never (1), seldom (2), sometimes (3), often (4), and very often (5). Hubbard

and Mannell (2001) found that the 35-item Negotiation Strategies Scale was reliable with a coefficient alpha of .89.

Motivation. The two motivation items from Hubbard and Mannell (2001) were slightly modified for language consistency with the PASE questions used in this study (in *italics*): “I participate or would like to participate in *recreation, sport or fitness activity* for my own immediate enjoyment or pleasure,” and, “I participate or would like to participate in a *recreation, sport or fitness activity* because it is good for my health.” The response options ranged from “Not at All” (1) to “Very Much” (5).

Physically Active Leisure. A paragraph on free time recreation, sport and fitness activities and a modified list of physical activities from the Historical Leisure Activity Questionnaire (Kriska et al., 1990) were provided to introduce respondents to a modified version of the Leisure Time Activity subscale of the PASE (NERI: New England Research Institutes, Inc., 1991), which assessed physically active leisure in the past seven days. The list of physical activities provided referenced both indoor and outdoor physical activities and gave an “other” option so that respondents did not feel compelled to list only the activities referenced.

Respondents were asked to complete four questions series from the Leisure Time Activity subscale pertaining to each of four intensity levels: light, moderate, strenuous, and muscle strength. The wording was modified to ask, “Over the past seven days, how often did you participate in [intensity level] *recreation, sport or fitness activities?*” Each of these questions was followed by a couple of examples of activities that might be considered within the given intensity level. However, the word “might” was used purposefully so that respondents would be encouraged to indicate activities under the categories as they saw fit, rather than according to *a priori* researcher established criteria. Frequency response options were (0) never,

(1) seldom (1-2 days), sometimes (3-4 days), and often (5-7 days). Duration response options were less than one hour (1), 1 but less than 2 hours (2), 2-4 hours (3), and more than 4 hours (4). Similarly, the open-ended activities question in the series was modified to: “What were these [intensity level] *recreation, sport or fitness activities?*” Examples of activities might be walking, golfing, swimming, and weight lifting. Based on the CDC (1997) definition of physical activity, respondents were allowed to indicate walking, gardening, and yard work activities within the intensity-based question series on physically active leisure in contrast to the original PASE, which separates walking from the intensity-based question series and which lists gardening and yard work in a separate section under household activities.

Following the PASE scoring protocol (NERI, 1991), frequency (days) and duration (hours) were converted into an hours per day score and then weighted by intensity level. The resulting value reflects a weighted sum score for physically active leisure across frequency, duration and intensity.

The PASE has been shown to have acceptable test-retest reliability (Washburn, Smith, Jette, & Janney, 1993) and validity (Martin et al., 1999; Washburn & Ficker, 1999; Washburn et al., 1999).

Data Analysis

The multidimensional measure of physically active leisure was normalized using a square root transformation. Resultant multiple regression model diagnostics (histogram, normal probability plot, and scatterplot) indicated that the standardized residuals conformed to ordinary least squares assumptions of linearity, normality and heteroscedascity. Amos 5.0 for SPSS 13.0 for Windows software was used to examine the bivariate relationships and to test the interactive

effects and the structural equation models, utilizing full information maximum likelihood (FIML) estimation, which is a method of handling missing data that creates accurate parameter estimates and standard errors (Graham, Cumsille, & Elek-Fisk, 2003).

To test the possible moderating influence of negotiation and motivation on the constraint-participation relationships, Barron and Kenny's (1986) protocol for testing interaction effects was used. An interaction term for negotiation and constraint (product of Negotiation X Constraint) and motivation and constraint (product of Motivation X Constraint) were calculated and included with their respective variable components in multiple regression equations with participation as the dependent variable, following Graham et al.'s (2003) procedures for regression analysis using Amos.

Structural equation modeling (SEM) was used to test the alternative models of the constraint negotiation process. SEM analysis is an inferential statistical methodology that combines a confirmatory factor analytic model (CFA; also called a measurement model) with a regression model (also called a structural model) with the aim of determining the goodness of fit between the hypothesized model and the sample data (Byrne, 2001). In effect, the goodness of fit reflects the degree to which the covariances implied by the hypothesized model fit the actual sample covariances; the closer the fit, the better the proposed model accounts for the variance in the data. Following Kline's (2005) recommendation, the measurement model was tested and respecified first to attain an acceptable measurement model prior to testing the alternative structural models. The measurement model consisted of four latent variables: constraints, negotiation, motivation, and physical activity participation. Participation was a single-indicator variable while constraints, negotiation and motivation were multiple-indicator variables. The three indicators for constraints and the four indicators for negotiation were the sub-domain mean

scores, using standardized items to control for unequal variances across items. The indicators for motivation were the scores for the enjoyment motive and health motive items. In sum, there were ten indicator (observed) variables. Determining whether respecification of the model was needed to increase the variance accounted for in the model was accomplished by examining the correlation residuals, which are the differences between the sample correlations and the predicted model correlations (Bollen, 1989). These residuals should be near zero for close-fitting models. Therefore, error terms associated with correlation residuals larger than .15 were allowed to covary to improve the measurement model prior to testing the full structural equation models. In full SEM (consisting of both CFA and regression analysis), the standardized parameter estimates (β s) for the indicators provide the factor loadings on the latent variable (CFA) whereas the standardized parameter estimates for the latent factors (regression model) provide information on the importance of the hypothesized relationships (Byrne, 2001).

The chi-square statistic provides one measure of goodness of fit; the higher the probability, the closer the fit (Bollen, 1989). However, achieving a nonsignificant chi-square statistic is difficult in practice because of its sensitivity to sample size and the assumption of perfect—as opposed to—close fit (Byrne, 2001). Therefore, a ratio of chi-square to degrees of freedom has been suggested, with ratios of three or less recommended (Carmines & McIver, 1981). Additionally, several fit indices have been proposed to address model fit. RMSEA (root mean square error of approximation) is an absolute fit index used to determine how well the model fits the population covariance matrix, with values less than .05 suggesting a good fit and values as high as .08 indicating an acceptable fit of the data (Browne & Cudeck, 1993). Incremental fit indices, including the CFI, IFI, NFI, and TLI, compare the hypothesized model to the baseline, or null, model (Byrne, 2001). Values greater than .95 indicate a close fit (Hu &

Bentler, 1999), with values as low as .90 suggesting an acceptable fit (Marsh, Hau, & Wen, 2004). The TLI (Tucker-Lewis Index; also called the NNFI, or Non-Normed Fit Index) takes into consideration the complexity of the hypothesized model and has been shown in simulation studies to be one of the most effective parsimony-adjusted fit indices (Williams & Holahan, 1994).

Results

Sub-sample Comparisons

Because the sample consisted of two sub-samples, one of park volunteers ($n = 150$) and one of park visitors ($n = 121$), a comparison of sub-sample characteristics was conducted to determine whether or not it was appropriate to conduct the statistical analyses with the full sample. The only statistically significant difference between the two samples was age, with the park volunteers being, on average, approximately three years older than the park visitors. Otherwise, the two samples were similar in terms of levels of constraint, negotiation, motivation, and physical activity, and they had a similar gender distribution. Therefore, the analyses were conducted using the full sample of park volunteers and park visitors.

Respondent Characteristics

Of the 271 respondents, 163 (60%) were female and 108 (40%) were male. Respondents ranged in age from 50 to 87 years old, with a mean age of 63.4 years ($SD = 8.9$). The majority of the sample was married (64%) and living with others (71%). Ninety-six percent of the respondents were Caucasian. Fifty-five percent of the respondents were retired, thirty percent

worked full-time, and eleven percent worked part-time. Approximately half (51%) of the sample had a college or university education, with 27% attaining graduate-level or professional degrees. Nearly half of the sample had a household income of \$50,000 or more (45%).

Item Consistency and Descriptive Information

Table 2.1 provides the means and standard deviations for each of the latent variables used in the model testing. It also provides the coefficient alpha values for the constraint and negotiation scales. Most of the coefficient alphas yielded acceptable values, with the exception of financial negotiation (.57), which was retained in the analyses due to the replication and confirmation purposes of the current study with prior constraint negotiation research.

TABLE 2.1 Descriptive Statistics for the Participation, Constraint, Negotiation, and Motivation Variables

Variables	<i>M</i>	<i>SD</i>	Coefficient alpha
Participation¹	4.71	2.79	...
Constraint (Total Scale)	2.66	0.46	.79
Intrapersonal	2.46	0.57	.69
Interpersonal	2.71	0.66	.62
Structural	2.92	0.68	.65
Negotiation (Total Scale)	2.89	0.49	.85
Time management	2.72	0.51	.71
Skill acquisition	3.08	0.68	.67
Interpersonal coordination	2.97	0.79	.71
Financial	2.95	0.72	.57
Motivation			
Enjoyment motive	4.08	1.12	...
Health motive	4.17	1.00	...

¹Square root transformation of the weighted sum score of frequency, duration, and intensity.

In terms of participation in physically active leisure, of the 259 respondents providing complete frequency information across intensity levels, 25 (10%) had not participated in any free time physical activities in the past week. Two-hundred twenty-one (94%) of the 234 active respondents participated in at least one light physical activity, participating on average approximately three to four days in the past week. In addition, of the active respondents, 121 (52%) respondents participated in at least one moderate activity, 50 (21%) respondents participated in at least one strenuous activity, and 87 (37%) respondents engaged in at least one muscle strengthening activity.

The mean score ($M = 2.66$; a range of 1.33 to 3.81) for the total constraint scale indicated that this sample of individuals 50 and older was moderately constrained, with the constraint sub-domain mean scores all falling near the scalar midpoint of 3. This sample scored structural constraints the highest, followed by interpersonal constraints and intrapersonal constraints, respectively (see Table 2.1). The mean score ($M = 2.89$; a range of 1.45 to 4.15) for the total negotiation scale indicated that the sample as a whole utilized moderate levels of negotiation strategies and resources, with all negotiation sub-domain mean scores near the midpoint. Of the four negotiation strategy and resources sets, this sample utilized skill acquisition strategies the most and time management strategies the least (see Table 2.1). Further, respondents were highly motivated to participate in physically active leisure for enjoyment ($M = 4.08$, 5-point scale) and for health benefits (4.17). The correlation coefficient for the enjoyment and health motives was $r = .66$ ($p < .01$).

Evaluating the Leisure Constraint Negotiation Models

Testing the moderating effects of motivation and negotiation on constraint. Neither the motivation-constraint interaction term nor the negotiation-constraint interaction term was statistically significant for physically active leisure participation. Therefore, the *negotiation-buffer model* and the *motivation-balance model* were not supported in this study and thus were not considered for further analysis.

Testing the independence and mediation (i.e., constraint-effects-mitigation and perceived-constraint-reduction) models of constraint negotiation. Structural equation modeling (SEM) was utilized to test and compare the fit of the *independence*, *constraint-effects-mitigation*, and *perceived-constraint-reduction models*. The measurement model was first tested as the baseline model. This model provided a minimally adequate fit of the data ($\chi^2/df = 2.54, p < .001, CFI = .93, TLI = .87, RMSEA = .08$). An assessment of the residual correlations of the measurement model suggested that the correlated error terms be specified for interpersonal constraint and interpersonal negotiation and structural constraint and financial negotiation. The creation of this respecified model fits with the theoretical expectation that interpersonal negotiation strategies relate to interpersonal constraints and that financial negotiation strategies relate to finance-based structural constraints. For example, a person might perceive fewer interpersonal leisure constraints because they access high levels of interpersonal negotiation resources, such as people with whom to participate or family support. Whereas, financial negotiation strategies might occur in response to finance-based structural constraints, such as a lack of money for clothes, equipment and/or fees. Specification of the correlated error terms for

these indicators (i.e., interpersonal constraint and interpersonal negotiation and structural constraint and financial negotiation) implies that there is a source of variability between them that is not accounted for by the underlying factors in the model (Kline, 2005), a situation that commonly occurs in research pertaining to social psychological constructs (Joreskog & Sorbom, 1993).

The model fit statistics for the respecified measurement model were improved substantially ($\chi^2/df = 1.51$, CFI = .98, TLI = .96, RMSEA = .04). The factor loadings associated with the indicators of the latent variables were moderate to high. Intrapersonal constraint had the highest factor loading on constraint, with a β of .71. Interpersonal constraint and structural constraint had factor loadings of .57 and .55, respectively. Time strategies had the highest factor loading on negotiation, with a β of .79, followed by skill acquisition ($\beta = .68$), financial strategies ($\beta = .66$), and interpersonal coordination ($\beta = .62$). The enjoyment motive ($\beta = .78$) and health motive ($\beta = .85$) had high factor loadings on motivation.

The alternative structural models incorporating the respecified measurement model were tested next. To aid comparisons of the overall pattern of fit of the alternative models between the two studies, the fit of the alternative models was examined using the same fit indices reported by Hubbard and Mannell (2001), and are provided in Table 2.2 alongside Hubbard and Mannell's findings.

In the *perceived-constraint-reduction model*, χ^2/df was 1.80, TLI was .92 and RMSEA was .07 in Hubbard and Mannell's study whereas χ^2/df was 4.40, TLI was .71 and RMSEA was .11 in this study. In contrast to Hubbard and Mannell's study, in this study the *independence* and *constraint-effects-mitigation models* provided the same degree of fit, with fit indices suggesting a good fit of these two models to the data ($\chi^2/df = 1.52$, CFI = .98, TLI = .96, RMSEA = .04).

TABLE 2.2 Summary of Fit Indices for the Independence, Constraint-Effects-Mitigation and Perceived-Constraint-Reduction Models: Hubbard and Mannell's (2001) Study and This Study¹

Model	χ^2/df	IFI	CFI	RMSEA	NFI	TLI
Hubbard & Mannell's (2001) Independence model	2.34	0.90	0.90	0.09	0.84	0.86
Replication Independence model	1.52	0.98	0.98	0.04	0.94	0.96
Hubbard & Mannell's (2001) Constraint-effect-mitigation model	1.62	0.96	0.95	0.06	0.89	0.94
Replication Constraint-effect-mitigation model	1.52	0.98	0.98	0.04	0.94	0.96
Hubbard & Mannell's (2001) Perceived-constraint-reduction model	1.80	0.94	0.94	0.07	0.88	0.92
Replication Perceived-constraint-reduction model	4.40	0.84	0.84	0.11	0.81	0.71

¹Because the models in Hubbard and Mannell (2001) and this study were specified differently, it is the overall pattern of fit between the alternative models of each study that is of interest rather than the differences between individual fit indices.

Although the bivariate correlation coefficient between motivation and participation was statistically significant ($r = .26, p < .001$), this relationship was no longer significant in the *mitigation models* and .11 in the *perceived-constraint-reduction model* ($p > .05$). The β s were also nonsignificant for the path linking constraint to negotiation (.07) in the *constraint-effects-mitigation model* and the path linking negotiation to constraint (.12) in the *perceived-constraint-reduction model*. Following backward stepwise regression procedures, all nonsignificant paths ($p > .05$) were omitted from the respective models and retested.

The *constraint-effects-mitigation* and the *perceived-constraint-reduction models* reduced to yield the same model. In this reduced model, the path between constraint and participation was negative ($\beta = -.34, p < .001$) and the path between negotiation and participation ($\beta = .33, p < .001$) and motivation and negotiation ($\beta = .37, p < .001$) were positive. Because there was not a

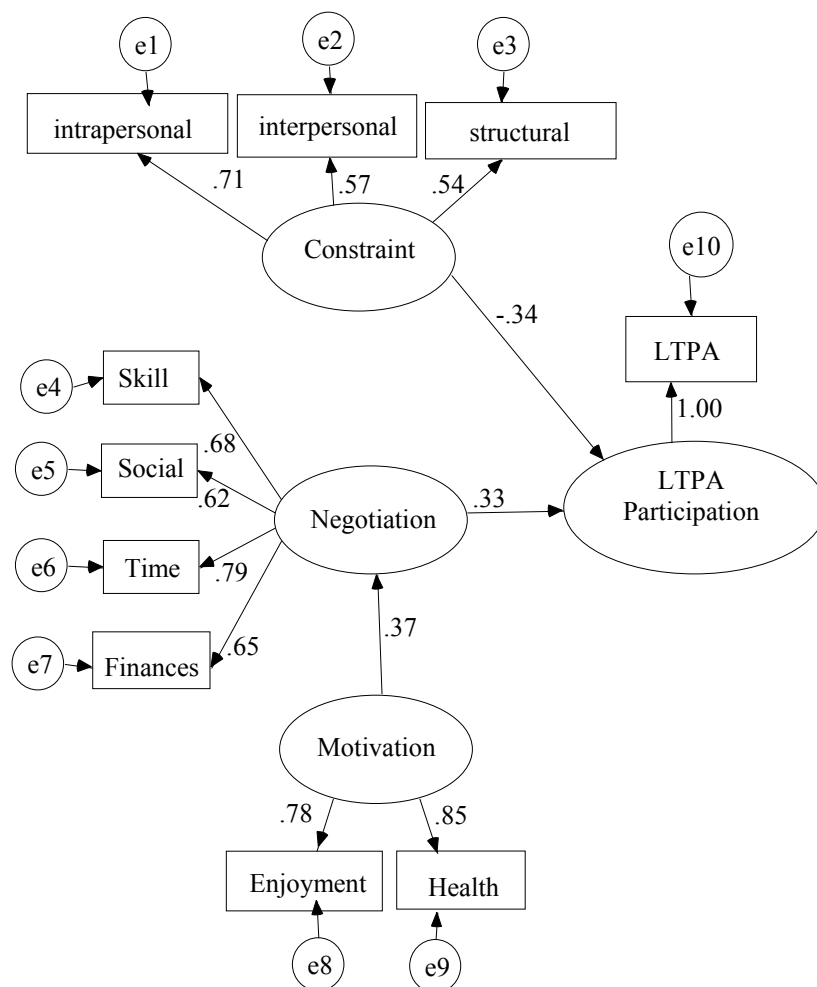
significant path between constraint and negotiation in this reduced model, it was renamed the *constraint-negotiation dual channel model* to distinguish it from the other models.

The fit of the *reduced independence model* and the *dual channel model* were similar, with both models providing a good fit of the data (see Table 2.3). The primary difference between the *reduced independence model* and the *dual channel model* is that the *dual channel model* includes the effect of motivation. The parsimony-adjusted TLI and the RMSEA of the *dual channel model* suggest that this model provided a slightly better fit of the data than the *reduced independence model* (see Table 2.3). The *dual channel model*, with factor loadings and regression paths, is depicted in Figure 2.3.

TABLE 2.3 Summary of Fit Indices for the Reduced Independence Model and the Constraint-Negotiation Dual Channel Model

Model	χ^2/df	IFI	CFI	RMSEA	NFI	TLI
Independence model (reduced)	1.54	0.98	0.98	0.05	0.93	0.95
Dual channel model	1.52	0.98	0.98	0.04	0.93	0.96

FIGURE 2.3 The constraint-negotiation dual channel model for physically active leisure in later life: Final latent variable model of the relationships between constraint, negotiation, motivation, and participation. (Covariances between constraint-motivation, social-interpersonal, and finances-structural are not shown.)



Discussion

Constraint and Negotiation Measurement Issues

One of the aims of this study was to test Hubbard and Mannell's (2001) leisure constraint negotiation models with a different age sample and with a multidimensional measure of physically active leisure. To aid in this endeavor, Hubbard and Mannell's Leisure Constraint

Scale and Negotiation Strategies Scale were used, omitting the workplace items. A few items that seemed particularly relevant for older adults (i.e., physical health concerns) were also added to the Leisure Constraint Scale. The internal consistency values for each of the constraint sub-domains were substantially higher in this study than they were in Hubbard and Mannell's (2001). For example, Hubbard and Mannell had a coefficient alpha of .50 for intrapersonal constraint whereas in this study the coefficient alpha for this sub-domain was .69. Likewise, the structural constraint sub-domain in Hubbard and Mannell's study had an alpha of .42 whereas it was .65 in the current study. An examination of what the coefficient alpha would be if individual items were omitted revealed that the health-related intrapersonal constraint items added to the internal consistency of the sub-domain. A similar explanation does not maintain for the structural constraint sub-domain because no items were added to this sub-domain, although work-related items were omitted.

In contrast to the higher coefficient alphas on the constraint sub-domains, the coefficient alphas were lower on three of the four negotiation sub-domains in this study, with two of four sub-domains achieving levels higher than .70, as opposed to three of four in Hubbard and Mannell's study. Additionally, the coefficient alpha was low for financial negotiation. The internal consistency of the total negotiation domain, however, was similar between the older sample in this study and the employee sample in Hubbard and Mannell's study (.85 and .89, respectively). In addition, the confirmatory factor analysis revealed that the constraint and negotiation sub-domains were all significant. As for the measures of motivation, there was a higher correlation coefficient between the health and enjoyment motive items in this study ($r = .66$) compared to Hubbard and Mannell's study ($r = .20$). And, these items loaded substantially higher in the confirmatory factor analysis, with values higher than .75, suggesting that these

items were useful measures of motivation for adults fifty and older. Because both the Hubbard and Mannell sample and this sample were largely samples of physically active people, these findings suggest that middle-aged and older adults may have more motivation to participate in physically active leisure for health and enjoyment in comparison to younger adults.

The Balance and Buffer Hypotheses

Jackson et al.'s (1993) "balance" proposition suggested that level of leisure participation may result from an interaction between motivations and constraints. However, in this study, motivation did not moderate the relationships between constraints and overall levels of physically active leisure. In other words, the relationships between constraints and the physical activity outcomes did not significantly differ between middle-aged and older adults with low levels of motivation and those with high levels of motivation. This finding may reflect the fact that most of the respondents were already active, or saw the value of physical activity, both in terms of participating in physically active leisure in the past week, and in terms of being active by volunteering for the park district and/or attending a special event held by the park district. Therefore, the failure to find differences in constraints by motivation is not surprising given the relatively homogeneous nature of the activity levels of the study sample and the fact that differences between low and high levels of motivation were relatively small (the majority of scores were between 6 and 10, reflective of moderate to high levels of motivation).

Hubbard and Mannell (2001) suggested that negotiation may "buffer" or moderate the effects of constraints on participation but they did not find support for this proposition. Consistent with their results, the findings of this study failed to support the buffer hypothesis with a sample of middle-aged and older adults: levels of negotiation did not influence

differentially the negative influence of constraints on physically active leisure. In other words, respondents utilizing negotiation strategies more often overall were not able to diminish the effect of constraints on participation any more so than were respondents utilizing negotiation strategies less often. To explain this finding, Hubbard and Mannell suggested that the buffer effect may not be as robust as is often presumed. This failure of negotiation to assuage the effects of constraints may have also resulted because the negotiation strategies people use do not actually match the constraints they face: no level of negotiation will lessen the negative effects of constraints on participation if the negotiation strategies used do not impact the constraints of interest. For example, if a person has a high level of negotiation strategies related to time, finances, and interpersonal coordination (leading to high levels of negotiation overall) but they have a high degree of intrapersonal constraints, constraints will still impact their participation because the strategies utilized do not adequately address these constraints. Looking at the relationships between specific negotiation strategies and specific constraints to participation rather than looking at the patterns in overall levels may help to clarify the conditions by which negotiation may buffer the effects of constraints on physically active leisure.

The Role of Motivation in Constraint Negotiation

As aforementioned, there was a lack of support for the *motivation-balance model* in this study. However, the *constraint-negotiation dual channel model*, which included the effect of motivation on negotiation, provided a better fit to the data than did the *reduced independence model*, which omitted the independent effect of motivation on participation. In fact, adding motivation increased, rather than decreased, the parsimony-adjusted fit of the *dual channel model*. The fact that the *perceived-constraint-reduction* and the *constraint-effects-mitigation*

models reduced to its equivalence provided further validation of the application of the *dual channel model* in this sample. These findings support previous theoretical and empirical research on the importance of motivation in the constraint negotiation process (Alexandris, Tsorbatzoudis, & Grouios, 2002; Carroll & Alexandris, 1997; Hubbard & Mannell, 2001; Jackson et al., 1993; Mannell & Loucks-Atkinson, 2005).

In both this study and Hubbard and Mannell's study, the relationship between motivation and participation was fully mediated by negotiation strategies. Motivation positively influenced negotiation strategies which, in turn, positively influenced participation. Therefore, this relationship was maintained with an older park-based sample when accounting for a wider range of activities (including both indoor and outdoor physical activities) and utilizing a multidimensional measure of physically active leisure. The fact that motivation was significantly related to negotiation strategies and indirectly related to physically active leisure in both Hubbard and Mannell's (2001) study and in this study has implications for leisure recreation programs aimed at increasing physical activity participation in later life. It appears that motivation plays a vital role in the utilization of strategies to overcome constraints to participation and thus it might be worthwhile to assess participants' motivation levels—in addition to participation levels—before, during and after a given program. Likewise, it might be helpful to identify whether or not negotiation strategies increased over the course of a given program.

Adopting a gendered life course perspective (Moen, 2001), it would be worthwhile to examine whether or not the relationships between motivation, negotiation, and participation differ for men and women fifty years of age and older. For instance, do motivation levels, or constraint negotiation, differ by gender? Furthermore, are there differences between men and

women in motivation levels or the utilization of negotiation strategies across the life course? If the answers to these questions yield differences by gender, these differences may reveal important implications for the development and implementation of leisure-based physical activity programs. Similarly, researchers should try to examine these factors for people of diverse racial and ethnic backgrounds to reveal any possible differences that might inform programmatic improvements.

Negotiation Strategies and Resources – Are They Just Facilitators?

The results did not support Hubbard and Mannell's (2001) finding that negotiation partially mediated the relationship between constraint and participation. Instead, the findings from this older adult sample indicated that constraint and negotiation work independently and with similar, but opposite, valence toward participation: negotiation positively influenced participation almost the same degree to which constraint negatively influenced participation. So, what about the debate raised by Hubbard and Mannell regarding whether or not these strategies and resources should be considered negotiators, or just facilitators? At face value, it may seem obvious that the strategies and resources utilized by the respondents were facilitators rather than negotiators, because the effects of negotiation were independent of participation. However, it may be useful to consider this question in light of the older sample that participated in this study. It may be the case that adults 50 and older have experienced years of competing demands and desires related to the manifold roles in their lives. As such, they may have negotiated some leisure constraints through the development of strategies, the identification of resources, and the utilization of both, to participate in the midst of them. However, some leisure constraints continue to be difficult to overcome and new ones may emerge, such as health limitations. It is

also possible that some of the strategies and resources that these adults use to facilitate participation occur irrespective of constraints (Hubbard & Mannell, 2001), particularly when constraints are conceptualized as perceptions. However, much of this discussion merely begs the question rather than provides a sufficient answer as to whether strategies and resources are negotiators or facilitators. Unfortunately, because of the cross-sectional design of this study, we cannot examine the relationships between lifelong leisure constraints, negotiation, and participation nor the possible ebb and flow of these relationships over time. Therefore, some words of caution are warranted—we do not wish to argue the omnipresence of constraint negotiation (for a more thorough discussion on this pitfall, see Samdahl, 2005). Rather, we hope to raise some additional research questions that may be useful in guiding future research on the constraint negotiation process. More research is clearly needed to adequately address this theoretical debate.

Understanding Constraint Negotiation in Context

Although one aim of this study was to extend Hubbard and Mannell's (2001) alternative models of the constraint negotiation process to an older sample, one of the limitations of the current study was that we chose not to examine other factors known to influence physically active leisure, such as age, or gender. For example, Altergott and McCreedy (1993) have provided support for studying age and gender in terms of constraint; they found that men were less constrained in physically active leisure than were women, irrespective of age. Additionally, Stanley and Freysinger (1995) and Shaw et al. (1991) found that men had higher participation levels in physically active leisure than did women. Henderson, Bedini, Hecht, and Schuler (1995) have studied the constraint negotiation process for women with disabilities but, otherwise,

there is little research on the role of age and gender in the constraint negotiation process. For example, would the inclusion of age and gender as independent variables change the nature of the relationships tested? Do age and gender influence the process of constraint negotiation, or do they only influence participation? Or, conversely, do they influence none of these factors?

Although the primary purpose of this study was to attempt to replicate Hubbard and Mannell's (2001) findings, and they did not include age and gender in their models, research on constraint negotiation might be enhanced through the incorporation of age and gender as factors in such models.

Another way to contextualize the constraint negotiation process would be to assess it for different aspects of physically active leisure. For example, it may be worthwhile to test a model of constraint negotiation in terms of intensity and duration of participation, in addition to the typical frequency assessment. Research on constraint negotiation would also benefit from an assessment of other leisure experiences beyond physically active leisure participation, such as enjoyment (Jackson & Scott, 1999; Nadirova & Jackson, 2000). And, there is a need for more qualitative research on constraint negotiation (e.g., Samdahl & Jekubovich, 1997; Scott, 1991) to further our understanding about how people, particularly individuals fifty and older—rather than researchers—view constraints, negotiation, motivation, and leisure participation. To examine whether or not the leisure constraint negotiation is a process—and, if so, in what cases it appears relevant—it needs to be studied over time, in interpersonal relationships, and in the socialization of specific leisure behaviors. For example, Mannell and Loucks-Atkinson (2005) recommended that researchers examine constraint negotiation as an ongoing process that may operate differently at different stages of participation (i.e., from the adoption to the maintenance stages). Hubbard and Mannell (2001) have contended that such longitudinal research has been lacking,

which still appears to hold true. There is also relatively little research on leisure constraint negotiation during life transitions (Jackson, 2005). For instance, do life transitions, such as later life career shifts or work retirement, lead to different constraints and resources? And, do negotiation strategies change during life transitions? These and other questions about the role of the constraint negotiation process in life transitions remain largely unanswered. Further, although there has been a substantial body of research on the role of leisure as a buffer to negative life events (see Hutchinson & Kleiber, 2005, for a review), there is little research on the constraint negotiation process in the aftermath of negative life events, such as after the loss of a loved one or the onset of a chronic illness or injury. In support of this research agenda, Mannell and Loucks-Atkinson (2005) have suggested that researchers conceptualize the constraint negotiation process as analogous to a transactional coping process.

Contextualizing leisure constraint negotiation would also be enhanced by examining constraint, negotiation, and motivation in reference to other variables. In particular, social cognitive factors—such as social support, self-efficacy, and self-identity—may be potentially helpful in understanding constraints and the utilization of negotiation strategies and resources. For instance, Hubbard and Mannell (2001) suggested that researchers attend to self-efficacy as a motivator as well as an indicator of negotiation success and Mannell and Loucks-Atkinson (2005) have provided a model of constraint negotiation that incorporates negotiation self-efficacy. Perhaps negotiation self-efficacy would help explain the independent effects of constraint and negotiation. For instance, it may be the case that confidence in one's ability to procure resources and to develop and initiate strategies influences the negotiation behaviors that facilitate participation in desired leisure activities, regardless of whether or not constraints are encountered.

The finding that specific types of constraints and negotiation strategies appeared to measure something in common that was not expressed in the alternative models also supports the relevance of attending to additional variables in the study of the constraint negotiation process. For instance, perhaps perceived interpersonal constraints and interpersonal negotiation strategies reflect an interpersonal leisure repertoire or an interpersonal leisure awareness. In fact, Hubbard and Mannell (2001) have suggested that it may be useful to examine a person's repertoire of resources in the constraint negotiation process. Further research on the constraint negotiation process may be enhanced by attending to the role of such factors in empirical models of the relationships between the constraint and negotiation sub-domains, in contrast to the general models of constraint and negotiation tested by Hubbard and Mannell (2001) and in this study.

Of particular import, future research on constraint negotiation is needed with representative samples from the general population to determine the generalizability of the results from this study and other studies utilizing convenience samples.

Conclusion

The current study partially replicated the results of the Hubbard and Mannell (2001) study with an older park-based sample, finding evidence for a motivation-negotiation process, in which negotiation fully mediates the relationship between motivation and participation in physically active leisure. However, there was no evidence in this study for a constraint-negotiation process; constraint and negotiation were unrelated, with both having independent and opposite effects on participation. Based on these findings, we proposed an alternative model for physically active leisure in later life—the *constraint-negotiation dual channel model*. Further research is needed to continue to test this model and alternative models of the leisure constraint

negotiation process with different populations, with additional factors, and across different leisure contexts to understand its role in leisure behavior.

References

- Alexandris, K., & Carroll, B. (1997). An analysis of leisure constraints based on different recreational sport participation levels: Results from a study in Greece. *Leisure Sciences, 19*, 1-15.
- Alexandris, K., Tsorbatzoudis, C., & Grouios, G. (2002). Perceived constraints on recreational sport participation: Investigating their relationship with intrinsic motivation, extrinsic motivation and Amotivation. *Journal of Leisure Research, 34*(3), 233-252.
- Alexandris, K., Barkoukis, V., Tsorbatzoudis, H., & Groulos, G. (2003). A study of perceived constraints on a community based physical activity program for the elderly in Greece. *Journal of Aging and Physical Activity, 11*, 305-318.
- Altergott, K., & McCreedy, C. C. (1993). Gender and family status across the life course. Constraints on five types of leisure. *Society and Leisure, 16*, 151-180.
- Barron, , R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York, NY: Wiley.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 445-455). Newbury Park, CA: Sage.
- Byrne, B. M. (2001). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- CDC. (1997). Monthly estimates of leisure-time physical inactivity—United States, 1994. Retrieved April 3, 2006, from

- <http://www.cdc.gov/mmwr/preview/mmwrhtml/00047596.htm>
- CDC. (2005). Trends in leisure-time physical inactivity by age, sex, and race/ethnicity—United States, 1994-2004. Retrieved May 23, 2006, from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5439a5.htm>
- Carmines, E. G., & McIver, J. P. (1981). Analyzing models with unobserved variables: Analysis of covariance structures. In G. W. Bohrnstedt and E. F. Borgatta (Eds.), *Social measurement: Current issues* (pp. 65-115). Beverly Hills, CA: Sage.
- Carroll, B., & Alexandris, K. (1997). Perception of constraints and strength of motivation: Their relationship to recreational sport participation in Greece. *Journal of Leisure Research, 29*, 279-299.
- Courneya, K. S., & McAuley, E. (1994). Are there different determinants of frequency, intensity, and duration of physical activity? *Behavioral Medicine, 20*(2), 84-90.
- Crawford, D. W., & Godbey, G. C. (1987). Reconceptualizing barriers to family leisure. *Leisure Sciences, 9*, 119-127.
- Crawford, D. W., Jackson, E. L., & Godbey, G. C. (1991). A hierarchical model of leisure constraints. *Leisure Sciences, 13*, 309-320.
- Frederick, C. J., & Shaw, S. M. (1995). Body image as a leisure constraint: Examining the experience of aerobic classes for young women. *Leisure Sciences, 17*, 57-73.
- Freund, A. M., & Baltes, P. B. (2002). Life-management strategies of selection, optimization, and compensation: Measurement by self-report and construct validity. *Journal of Personality and Social Psychology, 82*(4), 642-662.
- Graham, J. W., Cumsille, P. E., & Elek-Fisk, E. (2003). Methods for handling missing data. In J.A. Schinka & W. F. Velicer (Eds.), *Research methods in psychology* (pp. 87-114).

- Volume 2 of the *Handbook of psychology* (I. B. Weiner, Editor-in-Chief). New York: John Wiley & Sons.
- Henderson, K. A., Bedini, L. A., Hecht, L., & Schuler, R. (1995). Women with physical disabilities and the negotiation of leisure constraints. *Leisure Sciences, 14*, 17-31.
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1-55.
- Hubbard, J., & Mannell, R. (2001). Testing competing models of the leisure constraint and negotiation process in a corporate employee recreation setting. *Leisure Sciences, 23*, 145-163.
- Hutchinson, S L., & Kleiber, D. A. (2005). Leisure, constraints, and negative life events: Paradox and possibilities. In E.L. Jackson (Ed.), *Constraints to leisure*, (pp. 137-150). State College, PA: Venture.
- Jackson, E. L. (2000). Will research on leisure constraints still be relevant in the twenty-first century? *Journal of Leisure Research, 32*(1), 62-68.
- Jackson, E. L. (2005). Impacts of life transitions on leisure and constraints to leisure. In E.L. Jackson (Ed.), *Constraints to leisure*, (pp. 115-136). State College, PA: Venture.
- Jackson, E. L., & Rucks, V. C. (1995). Negotiation of leisure constraints by junior high and high school students: An exploratory study. *Journal of Leisure Research, 27*, 85-105.
- Jackson, E. L., & Scott, D. (1999). Constraints to leisure. In E. L. Jackson and T. L. Burton (Eds.), *Leisure studies: Prospects for the twenty-first century* (pp. 299-321). State College, PA: Venture.
- Jackson, E. L., Crawford, D. W., & Godbey, G. (1993). Negotiation of leisure constraints.

- Leisure Sciences*, 15, 1-11.
- Joreskog, K. G., & Sorbom, D. (1993). *LISREL 8: structural equation modeling with the SIMPLIS command language*. Chicago, IL: Scientific Software International.
- Kay, T., & Jackson, E. (1991). Leisure despite constraint: The impact of leisure constraints on leisure participation. *Journal of Leisure Research*, 23, 301-313.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: Guilford Press.
- Kriska, A. M., Knowler, W. C., LaPorte, R. E., Drash, A. L., Wing, R. R., Blair, S. N., et al. (1990). Development of a questionnaire to examine the relationship of physical activity and diabetes in Pima Indians. *Diabetes Care*, 13, 401-411.
- Mannell, R. C., & Kleiber, D. A. (1997). *Social psychology of leisure*. State College, PA: Venture.
- Mannell, R. C., & Loucks-Atkinson, A. (2005). Why don't people do what's "good" for them? Cross-fertilization among the psychologies of nonparticipation in leisure, health, and exercise behaviors. In E. L. Jackson (Ed.), *Constraints to leisure*, (pp. 221-232). State College, PA: Venture.
- Mannell, R. C., & Zuzanek, J. (1991). The nature and variability of leisure constraints in daily life: The case of the physically active leisure of older adults. *Leisure Sciences*, 13, 337-351.
- Marsh, H. W., Hau, K., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling*, 11(3), 320-341.

- Martin, K. A., Rejeski, W. J., Miller, M. E., James, M. K., Ettinger, Jr., W. H., & Messier, S. P. (1999). Validation of the PASE in older adults with knee pain and physical disability. *Medicine & Science in Sports & Exercise, 31*, 627-633.
- Moen, P. (2001). The gendered life course. In R. H. Binstock & L. K. George (Eds.), *Handbook of aging and the social sciences* (5th ed.) (pp. 179-196). New York: Academic Press.
- Nadirova, A., & Jackson, E. L. (2000). Alternative criterion variables against which to measure the impacts of constraints to leisure. *Journal of Leisure Research, 32*, 396-405.
- New England Research Institutes, Inc. (NERI). (1991). PASE: Physical Activity Scale for the Elderly. Watertown, MA: NERI.
- Raymore, L., Godbey, G., Crawford, D., & von Eye, A. (1993). Nature and process of leisure constraints: An empirical test. *Leisure Sciences, 15*, 99-113.
- Samdahl, D. M. (2005). Making room for “silly” debate: Critical reflections on leisure constraints research. In E. L. Jackson (Ed.), *Constraints to leisure*, (pp. 337-349). State College, PA: Venture.
- Samdahl, D. M., & Jekubovich, N. J. (1997). A critique of leisure constraints: Comparative analyses and understandings. *Journal of Leisure Research, 29*(4), 430-452.
- Scott, D. (1991). The problematic nature of participation in contract bridge: A qualitative study of group-related constraints. *Leisure Sciences, 13*, 321-336.
- Shaw, S. M., Bonen, A., & McCabe, J. (1991). Do more constraints mean less leisure? Examining the relationship between constraints and participation. *Journal of Leisure Research, 23*, 286-300.
- Skelton, D. A., & Beyer, N. (2003). Exercise and injury prevention in older people.

- Scandinavian Journal of Medicine & Science in Sports*, 13(1), 77-85.
- Stanley, D., & Freysinger, V. J. (1995). The impact of age, health, and sex on the frequency of older adults' leisure activity participation: A longitudinal study. *Activities, Adaptation and Aging*, 19(3), 31-42.
- Washburn, R. A., & Ficker, J. L. (1999). Physical Activity Scale for the Elderly (PASE): The relationship with activity measured by portable accelerometer. *Journal of Sports Medicine and Physical Fitness*, 39, 336-340.
- Washburn, R. A., McAuley, E., Katula, J., Mihalko, S. L., & Boileau, R. A. (1999). The Physical Activity Scale for the Elderly (PASE): Evidence for validity. *Journal of Clinical Epidemiology*, 52, 643-651.
- Washburn, R. A., Smith, K. W., Jette, A. M., & Janney, C. A. (1993). The physical activity scale for the elderly (PASE): Development and evaluation. *Journal of Clinical Epidemiology*, 15, 3-162.
- Wilcox, S., Castro, C., King, A. C., Housemann, R., & Brownson, R. C. (2000). Determinants of leisure time physical activity in rural compared with urban older and ethnically diverse women in the United States. *Journal of Epidemiology and Community Health*, 54(9), 667-672.
- Wilcox, S., Bopp, M., Oberrecht, L., Kammermann, S. K., & McElmurray, C. T. (2003). Psychosocial and perceived environmental correlates of physical activity in rural and older African American and white women. *Journals of Gerontology*, 58(6), P329-P337.
- Williams, L. J., & Holahan, P. J. (1994). Parsimony-based fit indices for multiple-indicator models: Do they work? *Structural Equation Modeling*, 1(2), 161-189.

Orientation to Chapter 3

Chapter 3 is written as a stand-alone manuscript to be later submitted in consideration for publication in a peer-reviewed journal. In terms of the dissertation research questions and hypotheses, the purpose of Chapter 3 is to investigate the following:

- RQ2. Is motivation positively related to physical activity participation?
- RQ3. Is age positively related to constraints?
- H2. Age will be negatively related to physical activity participation.
- H3. Female gender will be negatively related to physical activity participation.
- H4. Female gender will be positively related to constraints.
- H5. People with higher levels of constraint will have lower physical activity participation.
- H6. People with higher levels of constraint will have greater use of negotiation strategies.
- H7. Motivation will have an indirect, positive relationship with physical activity through negotiation strategies.

The overarching aim of this study was to incorporate age, gender and multiple measures of physically active leisure (frequency, duration, and a combination of these subdimensions with intensity) into the study of the constraint negotiation process. As such, RQ2 and H5 through H7 were given further consideration to determine whether or not different results were obtained in the study of the *constraint-effects-mitigation model*, when controlling for the effects of age and gender and depending on the type of physical activity measure used.

CHAPTER 3

PHYSICALLY ACTIVE LEISURE AND ITS SUBDIMENSIONS: WHAT ABOUT AGE AND GENDER IN THE CONSTRAINT NEGOTIATION PROCESS?

Abstract

The purpose of this study was to examine the relationships between age, gender, leisure constraints, leisure negotiation, motivation, and physically active leisure. The primary objectives were: 1) to assess the relationship of age and gender to leisure constraint and participation; 2) to test negotiation as a mediator of the relationships of constraints and motivation to overall participation, while controlling for the effects of age and gender; 3) to assess the relative importance of independent contributions to overall levels of participation; and 4) to determine whether or not these relationships differed by frequency and duration. Park volunteers and park visitors from a Midwestern metropolitan city aged 50 and older ($N = 271$) were used in this study. Negotiation was not a mediator of constraints and overall physically active leisure or its subdimensions. In addition, when controlling for the effects of age and gender, negotiation partially mediated the relationship of motivation to overall levels of participation. The direct and indirect effects of the predictors accounted for a significant proportion (27%) of the variance in overall participation. Different results were obtained for frequency and duration, with frequency mediating several effects on activity duration. The implications of these findings for park-based programs and settings for physically active leisure are discussed.

Introduction

Physical activity provides a multitude of health benefits, such as increased longevity and enhanced independence (Lee, Paffenbarger, & Hennekens, 1997; Shephard, 1997) as well as positive physical health (e.g., Chandler & Hadley 1996; Oguma, Paffenbarger, & Lee, 2001) and mental health (Patterson & Chang, 1999; Morgan & Bath, 1998) outcomes in later life. Even with these many health benefits, the majority of U.S. adults do not get adequate amounts of physical activity (CDC: Centers for Disease Control, 2000a), with older adults participating in the lowest levels of physical activity across age groups (CDC, 2000b). Understanding the role of factors that positively and negatively influence physical activity participation in later life may highlight possible solutions to improving the low levels of participation in this population. Further, elucidating what factors contribute to the specific domains of physical activity, such as the frequency of participation and the duration of an activity session, as well as the nature of their interrelationship, may enhance recreation and park programming of physically active leisure.

Leisure Constraints and Negotiation

Leisure constraints are typically defined as factors that limit or prohibit participation in desired leisure activities (Crawford & Godbey, 1987; Crawford, Jackson, & Godbey, 1991). Crawford and Godbey (1987) described three domains of constraints—intrapersonal, interpersonal and structural. Intrapersonal constraints were defined as within the individual, such as lack of self-efficacy, lack of interest, and physical inability. Interpersonal constraints were essentially social interaction considerations; for example, not having someone with whom to

participate. Structural constraints were defined as features of the environment, such as lack of facilities, lack of low-cost options, and absence of sidewalks.

Crawford, Jackson and Godbey (1991) later developed a hierarchical model of leisure constraints, with three main extensions to the earlier conceptualization: 1) explicit articulation of constraints negotiation, in which people must deal with constraints to overcome them; 2) a hierarchy of importance, from proximal (intrapersonal) to distal (structural); and 3) a hierarchy of social privilege, with emphasis on the ways that opportunities and constraints differ by social class. Jackson, Crawford, and Godbey (1993) provided further elaboration of the hierarchical model in response to research on constraints negotiation (Kay & Jackson, 1991; Scott, 1991; Shaw, Bonen, & McCabe, 1991), focusing on level of participation rather than an either/or dichotomy between participation and nonparticipation. There is some support for the propositions outlined by Jackson et al. (1993) (Alexandris & Carroll, 1997; Alexandris, Tsorbatzoudis, & Grouis, 2002; Carroll & Alexandris, 1997; Hubbard & Mannell, 2001; Raymore, Godbey, Crawford, & von Eye, 1993), although there is a lack of research utilizing different populations (Hawkins, Peng, Hsieh, & Eklund, 1999) or multiple methodologies (Samdahl & Jekubovich, 1997), which raises questions as to the model's applicability.

Based on Jackson et al.'s (1993) propositions, Hubbard and Mannell (2001) tested four competing models on the role of constraints, negotiation and motivation on physically active leisure, finding support for what they called the "constraint-effects-mitigation" model. They found that there were two counterbalancing forces that took place in the presence of constraints. Constraints negatively influenced participation and, at the same time, positively influenced the use of negotiation resources and strategies; there was some mitigation of the negative effects of constraints on participation through negotiation. Therefore, negotiation partially mediated the

relationship between constraints and physically active leisure. Their results provided support for the notion that people with more constraints may still participate, and may actually participate more than, people with fewer constraints (Kay & Jackson, 1991; Shaw et al., 1991).

Based on the structural equation model and hierarchical regression analysis results, Hubbard and Mannell concluded that further research on constraints, negotiation and motivation is needed with other populations and activities, as well as refinements in measurement, to determine the generalizability of their results.

Motivation and Constraint Negotiation

The inclusion of motivation into the hierarchical constraints model and the elaboration of its possible influence on leisure preferences, interpersonal compatibility and coordination efforts, and level of participation have provided the impetus for research that has helped clarify the relationships between constraints, negotiation and motivation and their influence on leisure participation (Alexandris et al., 2002; Carroll & Alexandris, 1997; Hubbard & Mannell, 2001). For instance, Carroll and Alexandris (1997) found that, in the case of recreational sport participation, motivation was positively associated with participation while constraints were negatively associated with participation. Alexandris et al. (2002) also found that intrapersonal constraints accounted for 38% of the variance in lack of motivation and 15% of the variance in intrinsic motivation (only individual/psychological and lack of interest had significant contributions) but that there was no relationship between interpersonal and structural constraints and motivational types nor between any of the constraint domains and extrinsic motivation.

Hubbard and Mannell (2001) also tested the role of motivation in the constraint negotiation of physically active leisure, finding that motivation had an indirect effect, through

negotiation, on participation. Thus, similar to the effect of negotiation on the constraint-participation relationship, they found that negotiation mediated the relationship between motivation and participation. In fact, due to its nonsignificance, the direct path between motivation and participation was removed from their final model, indicating that negotiation fully mediated the motivation-participation relationship.

Aside from these studies, there has been relatively little research on the role of motivation in the context of constraints to and negotiation of leisure participation, although motivation has been shown to be an important factor for participation in diverse leisure activities and settings (see Iso-Ahola, 1999 and Mannell & Kleiber, 1997 for reviews). Mannell and Loucks-Atkinson (2005) maintained that motivation should be considered a key component in the study of leisure constraints and negotiation. Similarly, Hubbard and Mannell (2001) suggested that further research is needed testing models of leisure constraint, negotiation, and motivation with different samples and activities. Even so, there appear to be no studies that have tested the role of motivation in the leisure constraint negotiation process for people fifty and older nor any that compare how these processes might be different for men and women.

Constraints, Physical Activity and Participant Characteristics

Although not in relation to the constraint negotiation process, research in the public health field has found that participation in physically active leisure differs depending on age and gender (see Rhodes et al., 1999, for a review). These findings indicate that older adults and women have the lowest levels of physical activity.

Jackson (2000) and Shaw and Henderson (2005) have also suggested that researchers need to account for sociodemographic factors—such as age and gender—when studying leisure

constraints, leisure experience and leisure behavior. Providing support for this call, Stanley and Freysinger (1995) found that women had lower sports participation at two separate time periods than did men, with both groups showing significant decreases in participation at follow-up 16 years later. In addition, they pointed out that there were still sex differences in leisure participation even though men and women were similar in terms of physical health declines and other sociodemographic factors. Similarly, Shaw, Bonen and McCabe (1991) found that women's physical activity participation was lower than men's participation. They also found that age accounted for eight percent of the variance in physical activity participation. Providing further support for examining age, gender and leisure constraints, Jackson and Henderson (1995) found that women were more constrained in their physical activity than men irrespective of age.

However, a study by Alexandris, Barkoukis, Tsorbatzoudis, and Grouios (2003) did not find gender differences in the constraints of older Greek participants in a physical activity program. Additionally, there has been little research regarding the influence of age on overall levels of leisure constraints (Alexandris et al., 2003). Instead, research has revealed different patterns of age differences by constraints types (Alexandris & Carroll, 1997; Jackson, 1993; McGuire, Dottavio, & O'Leary, 1986; Searle & Jackson, 1985); for example, intrapersonal constraints increase with age (Alexandris & Carroll, 1997; Searle & Jackson, 1985) whereas finance-based structural constraints decrease with age (Jackson, 1993). These findings taken altogether reveal that the role of age and gender in the constraint negotiation of physically active leisure is still unclear. Therefore, there were several aims of the present study in relation to age and gender. One central aim was to examine the possible effects of age and gender on constraints in an attempt to clarify these relationships. Based on Jackson and Henderson's (1995) findings, we hypothesized that women would have more constraints than men. We also

expected that age would be related to overall constraints levels, although the directionality of this possible relationship is unclear because of the different patterns of age differences by constraints types. Another aim was to control for the effects of age and gender in the examination of the constraint negotiation process for physically active leisure with the expectation that, similar to previous research, age and gender would directly influence participation.

Multidimensionality of Physically Active Leisure

The majority of studies on physically active leisure have utilized only one dimension of physical activity, such as frequency of participation in the past year, month, or week (Alexandris & Carroll, 1997; Alexandris et al., 2003; Hubbard & Mannell, 2001), or duration of participation (Mannell & Zuzanek, 1991). Shaw et al.'s (1991) research is an exception. They used both frequency and duration of participation in their study of physically active leisure.

Utilizing measures that incorporate the multiple dimensions of physically active leisure has both intuitive appeal and theoretical value. Constraints researchers (Jackson & Henderson, 1995; Kay & Jackson, 1991; Mannell & Zuzanek, 1991; Raymore et al., 1993) have suggested that time constraints may affect both the frequency and duration of physically active leisure. However, the degree to which constraints influence frequency and duration may differ. This possibility is consistent with Kay and Jackson's (1991) finding that constraints may be perceived without leading to nonparticipation. Instead, people may continue to participate (frequency stays the same) but for shorter periods of time per session (duration decreases) in order to "save" time. Similarly, different types of negotiation may play varying roles in the frequency and duration of physically active leisure. For instance, someone engaged in interpersonal negotiation may be more likely to negotiate opportunities for participation (frequency) in desired physical activities

but, at the same time, may be more willing to compromise on the length of engagement (duration) in these activities. On the other hand, doing more activities close to home may not affect how often one participates (frequency) but may increase the amount of time available to engage in the activity (duration). Intrapersonal negotiation—such as learning new activities and working on desired skills—may impact both the frequency and duration that one spends on a desired physical activity. In sum, there has been a lack of research assessing the influence of constraints and negotiation on multiple dimensions of physically active leisure.

Other factors—such as motivation—also may contribute differently to frequency and duration of physically active leisure. For example, motivation to participate in physically active leisure might have more influence on frequency of participation but relatively little influence on duration. Unfortunately, studies assessing multidimensional aspects of physical activity have not assessed the role that motivation might play (Courneya & McAuley, 1994) and studies that include motivation do not utilize multiple measures (Alexandris et al., 2002; Carroll & Alexandris, 1997; Hubbard & Mannell, 2001). Similarly, sociodemographic factors, such as age and gender, may be important predictors for frequency but not duration of participation, or vice versa. There is a lack of understanding as to how these various factors impact different dimensions of physically active leisure.

There is also little understanding about the possible relationship between the subdimensions of physically active leisure, such as frequency and duration, although it seems probable that the number of days spent per week participating in freely chosen, physically active leisure pursuits (frequency) would be associated with the number of hours per week engaging in these activities (duration). Moreover, little is known about the possible ways that constraints, negotiation and motivation may differentially influence these aspects of physical activity. It may

be the case that frequency mediates some or all of the relationships between the constraint negotiation domains (i.e., constraints, negotiation and motivation) and the duration of activity participation.

Utilizing multidimensional measures of physically active leisure may lead to more accurate empirical tests of explanatory factors and their relative importance. Moreover, revealing the patterns of the relationships for overall levels of physically active leisure and its subdimensions is expected to reveal important distinctions that will help to inform the design and implementation of programs intended to increase this type of participation.

Study Purpose and Research Objectives

The purpose of this study was to examine the role of age, gender, constraints, negotiation and motivation on multiple dimensions of physically active leisure. There were four objectives of this study. The first objective was to assess the relationship of age and gender to leisure constraints. The second objective was to test whether or not negotiation mediated the relationships of constraints and motivation to overall participation (Hubbard & Mannell, 2001), while controlling for the effects of age and gender. The third objective was to determine the independent contributions of age, gender, constraints, negotiation and motivation on overall levels of physically active leisure, while controlling for possible indirect effects. And, a fourth and final objective was to determine whether or not these relationships differed by the physical activity dimensions, frequency and duration, taking into consideration their interrelationship.

Methods

Respondents and Procedure

Two-hundred seventy-five volunteers and visitors of a park district in a Midwestern metropolitan city aged fifty and older comprised the sample. Four were omitted because of extreme physical activity scores, resulting in a total sample of two-hundred seventy-one.

Individuals were asked to complete an on-site self-administered questionnaire in September, 2005, during two community-wide, free special events held by the park district as well as volunteer sessions with park volunteers at five park district offices. Respondents were unpaid volunteers but were offered incentives such as complimentary refreshments, door prizes (food baskets), and raffle prizes (restaurant, book store, and movie gift certificates).

Respondents were also given the option to take the questionnaire home and to return it in a postage-paid return addressed envelope. Mail-back questionnaire packets were also left at the park district offices for potential respondents to complete and return. See Chapter 1 for more detail on the sampling frame and procedure.

Instrumentation

The constructs of interest in this study were physically active leisure, constraints, negotiation, and motivation.

Physically active leisure. An introductory paragraph about free time recreation, sport and fitness activities and a modified list of physical activities from the Historical Leisure Activity Questionnaire (Kriska et al., 1990) were provided to orient the respondents to the questions about physically active leisure. The Leisure Time Activity sub-scale of the Physical Activity Scale for

the Elderly (PASE) (New England Research Institutes, Inc., 1991) was used to assess respondent's physically active leisure in the past seven days. This sub-scale has questions for four leisure-time physical activity intensity levels—light, moderate, strenuous, and muscle strength. The questions pertain to frequency (0-3; 4-point ordinal scale of the number of days) and duration (1-4; 4-point ordinal scale of hours) of physical activity as well as an open-ended question about the type of activity (e.g., swimming, walking, golfing, etc.).

The PASE questionnaire includes a separate question on walking under the Leisure Time Activity sub-scale and includes gardening and yard work under the Household Activity sub-scale. Because walking and gardening/yard work are considered leisure-time physical activities by the U.S. government (CDC, 1997), the Leisure Time Activity sub-scale was modified so that respondents could indicate these activities under the four physically active leisure categories. Therefore, the Leisure Time Activity sub-scale question pertaining to walking was omitted.

Following the procedures outlined by the PASE scoring manual, a weighted sum score across frequency, duration and intensity was computed for the variable, "overall physically active leisure." First, a conversion table was used to determine the hours (duration) per day (frequency) values. Then, the hours per day values were weighted according to intensity level. To examine the possible relationships of the study variables to frequency and duration, sum scores were calculated across intensity levels for frequency (0-12; zero indicated no days of participation in the previous seven days) and duration (0-16; zero indicated no hours) as well.

Washburn, Smith, Jette, and Janney (1993) found that the test-retest reliability of the PASE scale, including the leisure-time sub-scale, was .75. Other studies have validated the PASE with sedentary adults (Washburn et al., 1999), older adults with disabilities (Martin et al., 1999), and with objective measures of physical activity (Washburn & Ficker, 1999).

Constraints and Negotiation. Constraints were measured with a modified version of the Hubbard and Mannell (2001) Leisure Constraint Scale, omitting items referencing workplace exercise programs and adding items on poor health (Shaw et al., 1991) and fear of getting hurt (Alexandris et al., 2003). Some examples of items: “I am too shy to start an activity” (intrapersonal constraint), “The people I know live or work too far away” (interpersonal constraint), and “I would do an activity if I had money for clothes, equipment, and fees” (structural constraint). Response options were strongly disagree (1) to strongly agree (5). Hubbard and Mannell (2001) found that the 32-item Constraints Scale had acceptable reliability, with a coefficient alpha of .72.

Negotiation strategies were measured using the Hubbard and Mannell (2001) Negotiation Strategies Scale, modified for consistency with the physically active leisure terminology used in the PASE questions, and omitting items referencing workplace items exercise programs. Negotiation strategies included time management, skill acquisition, interpersonal coordination, and financial management. Some examples of items are, “I get up earlier or stay up later to make recreation, sport or fitness time” (time management), “I try to learn new activities” (skill acquisition), “I try to meet people with similar interests” (interpersonal coordination), and “I try to budget my money” (financial management). The response options were modified for consistency with the physical activity response options: never (1), seldom (2), sometimes (3), often (4), and very often (5). A “does not apply” option was also added. “Does not apply” provides additional information but it is also necessarily and sufficiently “never.” It was included to provide additional descriptive information on the degree to which the negotiation items, particularly items pertaining to family negotiation, were applicable to middle-aged and older adults. “Does not apply” responses were recoded “never” for the purposes of the study

analyses. Hubbard and Mannell (2001) found that the 35-item Negotiation Strategies Scale was reliable with a coefficient alpha of .89.

Motivation. The two motivation items from Hubbard and Mannell (2001) were slightly modified for word consistency with the PASE questions: “I participate or would like to participate in recreation, sport or fitness activity for my own immediate enjoyment or pleasure,” and, “I participate or would like to participate in a recreation, sport or fitness activity because it is good for my health.” The response options ranged from “Not at All” (1) to “Very Much” (5).

Data Analysis

The overall measure of physically active leisure and the duration subdimension were transformed using a square root transformation. Diagnostics on the two transformed dependent variables as well as frequency (untransformed) indicated that the standardized residuals conformed to normality and linearity assumptions. Descriptive results (i.e., percentages and variances) suggested that all of the negotiation items were relevant to this sample, so they were retained in the analyses. Due to large variances on some items, the constraint and negotiation items were standardized using z-score transformations, with indices calculated for each of the respective sub-scales.

Amos 5.0 for SPSS 13.0 for Windows software was used to conduct structural equation modeling (SEM), utilizing full information maximum likelihood (FIML) estimation for missing data, which creates accurate parameter estimates and standard errors (Graham, Cumsille, & Elek-Fisk, 2003). SEM provides increased explanatory power, controls for measurement error, and has more indicators of goodness of fit than the ordinary least squares statistical method (Kline, 2005). Structural equation modeling has a confirmatory factor analysis (measurement model)

component and a regression analysis (structural model) component (Byrne, 2001). Therefore, direct and indirect effects may be examined using structural equation modeling just as in ordinary least squares regression.

Two structural equation models were tested: the first with negotiation as a possible mediator of the motivation-participation and constraint-participation relationships on overall physical activity level, and the second testing these paths for frequency and duration of physical activity. In the latter case, frequency was expected to influence duration and, therefore, this direct path was included in the second model (frequency as a mediator). In both models, the relationships between age and gender on constraint were also included.

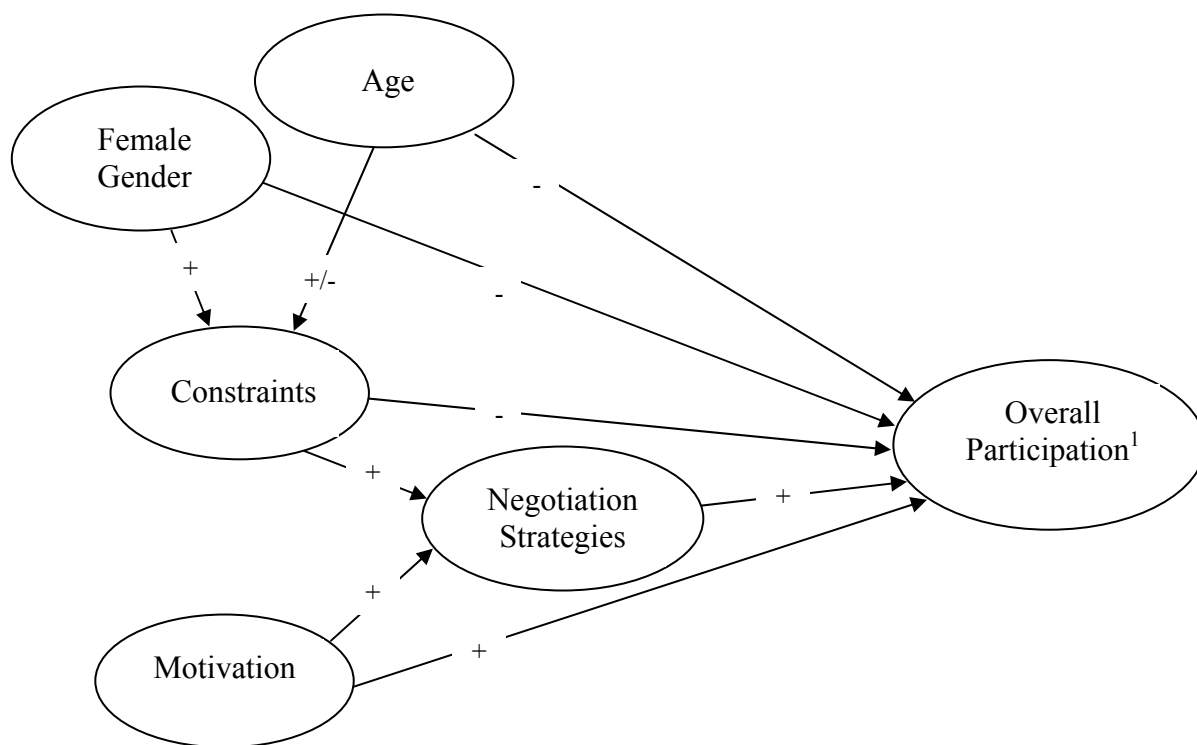
The first model consisted of six variables: constraints, negotiation, motivation, age, gender, and physical activity participation. Age, gender, and physical activity participation were single-indicator variables and constraints, negotiation and motivation were multiple-indicator variables. The three indicators for constraints and the four indicators for negotiation consisted of their respective sub-scale mean scores. The indicators for motivation were the scores for the enjoyment motive and health motive items. In sum, there were twelve indicator variables for the first model. The second model included the single-indicator frequency and duration measures in place of the overall physical activity measure. Therefore, the second model had thirteen indicator variables.

The chi-square statistic provides one measure of goodness of fit, with a small, nonsignificant chi-square indicating “a close fit” of the data (Bollen, 1989). Because the chi-square statistic is sensitive to sample size, other fit indices have been used in conjunction with the chi-square statistic to assess the goodness of model fit (Byrne, 2001). A ratio of chi-square to degrees of freedom of three or less is typically recommended (Carmines & McIver, 1981).

The root mean square error of approximation (RMSEA) is an absolute fit index and measures how well the sample data fits the true population, with values less than .05 suggesting a good fit and values as high as .08 indicating an acceptable fit of the data (Browne & Cudeck, 1993). The comparative fit index (CFI) has been recommended as an incremental fit index that compares the hypothesized model to the baseline model (Bentler, 1990), with values greater than .95 indicating a close fit and values as low as .90 suggesting an acceptable fit (Hu & Bentler, 1995; Marsh, Hau, & Wen, 2004).

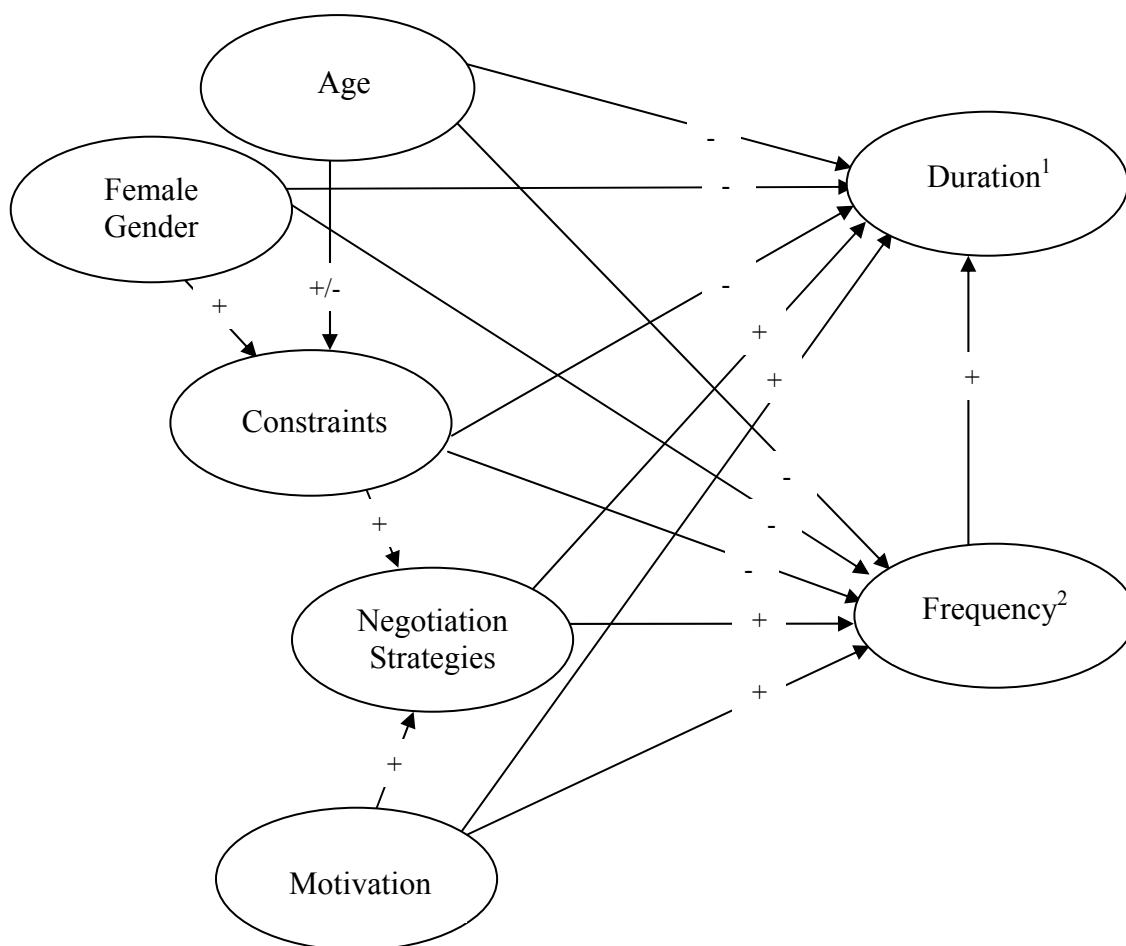
The hypothesized models for overall physically active leisure and its frequency and duration subdimensions are presented in Figures 3.1 and 3.2, respectively.

Figure 3.1. Model 1: Hypothesized model for overall physically active leisure.



¹ Square root transformation of physical activity sum score across frequency, duration and intensity.

Figure 3.2. Model 2: Hypothesized model for frequency and duration.



¹ Square root transformation of duration score across intensity levels.

² Untransformed frequency score across intensity levels.

Results

Sub-sample Comparisons, Respondent Profile and Descriptive Data

A comparison of sub-sample characteristics indicated that the park visitor and park volunteer sub-samples had similar levels of constraints, negotiation, motivation, and physical activity, and had similar gender distributions. Park volunteers were approximately three years

older than park visitors. Due to the sub-sample similarities, they were combined into one sample for the purposes of the data analyses.

Of the 271 respondents, 163 (60%) were female and 108 (40%) were male. Respondents ranged in age from 50 to 87 years old, with a mean age of 63.4 years ($SD = 8.9$). For additional demographic information, see Article 1 (Chapter 2). The respective average overall levels of constraints and negotiation were 2.66 ($SD = .46$) and 2.89 ($SD = .49$). The mean level of motivation for enjoyment and health combined was 8.24 ($SD = 1.94$). Overall physically active leisure scores ranged from 0 to 135.58, with an average score of 30.06 ($SD = 22.47$). The mean frequency and duration scores were 3.33 ($SD = 2.31$) and 3.51 ($SD = 2.59$), respectively.

Model Testing

Measurement and Structural Equations

A two-step procedure was used to assess the structural equation models (Kline, 2005). In the first step of the procedure, the respective measurement models for overall physically active leisure and frequency and duration were examined using confirmatory factor analysis to confirm the viability of the baseline models. These models had a minimally adequate fit of the data (*Model 1 CFA*: $\chi^2/df = 2.87$, CFI = .88, RMSEA = .08; *Model 2 CFA*: $\chi^2/df = 2.67$, CFI = .91, RMSEA = .08). Model diagnostics of the correlation residuals (Bollen, 1989) indicated that the measurement models would be improved by including the covariance between interpersonal constraint and interpersonal negotiation and the covariance between structural constraint and financial negotiation. These sub-domain variance relationships fit with theoretical expectations: interpersonal negotiation is expected to have some commonality with interpersonal constraints

and, likewise, financial negotiation is expected to have some commonality with structural constraints. Therefore, because these relationships support theoretical conceptualizations, these respective indicators were allowed to covary. The respecified measurement models were improved substantially, with the overall fit indices indicating an acceptable fit of the data. In *Model 1 CFA*, $\chi^2/df = 2.17$, CFI was .93, and RMSEA was .07. In *Model 2 CFA*, $\chi^2/df = 2.06$, CFI was .94, and RMSEA was .06. After determination of the adequacy of the respecified measurement models, the full structural equation models were tested. Each model was reduced utilizing backward stepwise regression procedures based on significance cut-off values of $p < .05$.

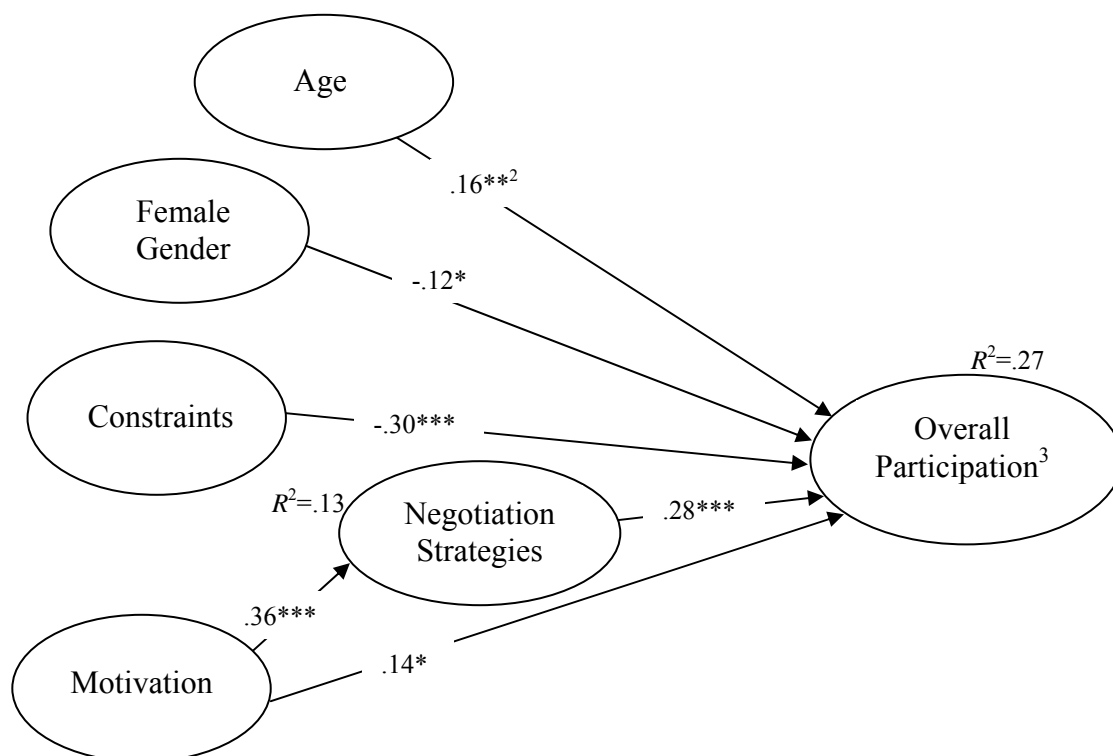
Model 1: Mediation of Overall Levels of Physically Active Leisure

Age and gender did not have significant effects on constraints ($\beta = -.05$ and $\beta = .01$, $p > .05$, respectively). And, negotiation did not have a significant influence on the relationship between constraints and overall levels of physical activity in this sample ($\beta = .06$, $p > .05$). Figure 3.3 depicts the reduced model with the nonsignificant paths removed. It shows the direct effects of age, gender, constraints and negotiation and the direct and indirect effects of motivation for overall physical activity scores. This model provided an acceptable fit of the data ($\chi^2/df = 2.05$, CFI = .93, RMSEA = .06). The variables in the reduced model accounted for 27% of the variance in overall levels of physically active leisure.

Negotiation partially accounted for the relationship between motivation and overall physical activity scores, with the direct effect of motivation decreasing in significance from $p < .001$ to $p < .05$, when controlling for the indirect effect and the other factors in the model. The standardized regression coefficient for the indirect effect ($\beta = .10$) was significant at the $p < .01$

level. Motivation accounted for 13% of the variance in the utilization of negotiation strategies and resources.

Figure 3.3. The role of age, gender, constraints, negotiation and motivation on overall level of physically active leisure: Final model.¹



¹ The indicators and error variances of the factors are not displayed for simplification.

² *** $p < .001$, ** $p < .01$, * $p < .05$

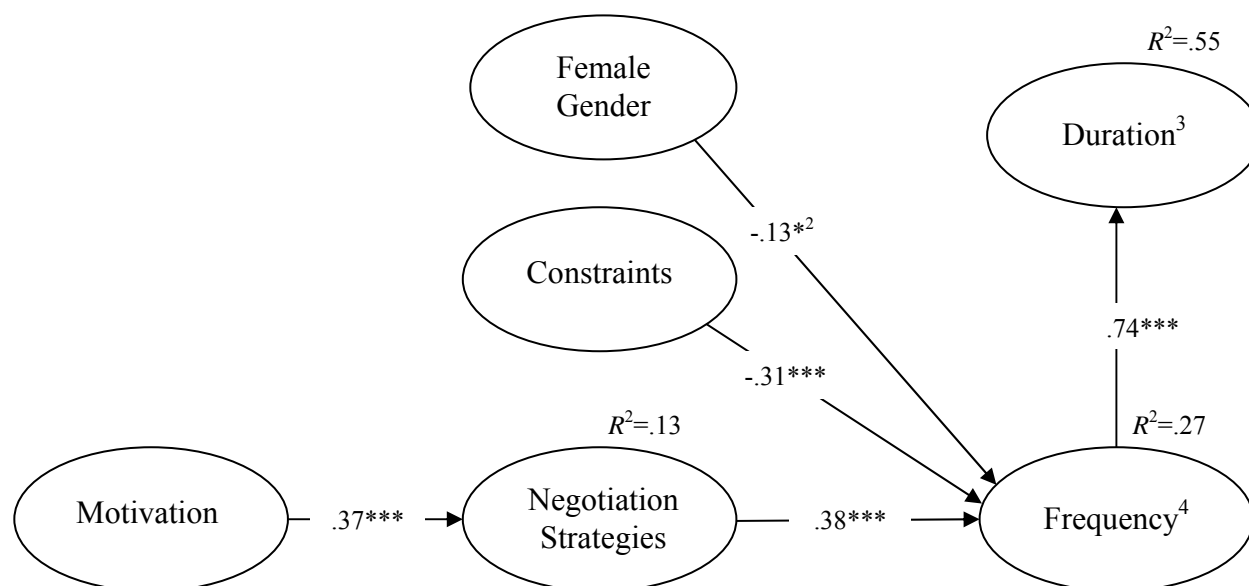
³ Square root transformation of physical activity sum score across frequency, duration and intensity.

There were significant direct effects for all of the variables on overall physical activity scores. Constraint was the most significant independent predictor ($\beta = -.30, p < .001$), followed by negotiation ($\beta = .28, p < .001$), age ($\beta = .16, p < .01$) and motivation ($\beta = .14, p < .05$). Gender was also a significant predictor ($\beta = -.12, p < .05$); women had significantly lower overall participation scores than did men.

Model 2: Mediation of Frequency and Duration of Physically Active Leisure

Model 2 tested three mediation models simultaneously. More specifically, this model tested: 1) the direct and indirect effects of age and gender on frequency and duration (constraints as mediator), 2) the direct and indirect effects of constraints and motivation on frequency (negotiation as mediator), and 3) the direct and indirect effects of these factors on duration, as well as the direct effect of frequency on duration (frequency as mediator). The reduced model was a good fit of the data ($\chi^2/df = 1.65$, CFI = .96, RMSEA = .05), accounting for 27% of the variance in frequency and 55% of the variance in duration (Figure 3.4).

Figure 3.4. The role of age, gender, constraints, negotiation and motivation on frequency and duration: Final model.¹



¹ The indicators and error variances of the factors are not displayed for simplification.

² *** $p < .001$, ** $p < .01$, * $p < .05$

³ Square root transformation of duration score across intensity levels.

⁴ Untransformed frequency score across intensity levels.

Negotiation, constraints, and gender were significant independent predictors of the level of physical activity frequency in the past week. Negotiation was the most significant independent contributor to frequency ($\beta = .38, p < .001$), followed by constraints ($\beta = -.31, p < .001$), and gender ($\beta = -.13, p < .05$). Age and motivation were not significant independent contributors to frequency.

Similar to *Model 1*, negotiation did not account for the relationship between constraints and frequency. In contrast to *Model 1*, negotiation fully explained the relationship between motivation and frequency, with the direct effect of motivation on frequency decreasing in significance from $p < .05$ to $p > .05$, when controlling for the indirect effect through negotiation. The indirect effect had a $\beta = .14$, significant at the $p < .001$ level.

Frequency of participation in the past seven days was strongly related to duration level in the past seven days ($\beta = .74, p < .001$). However, the direct effects of negotiation, constraints and gender on duration were reduced to nonsignificance once the relationship between frequency and duration was included in the model, with significant indirect effects on duration through frequency. Negotiation had the strongest indirect effect ($\beta = .28, p < .0001$), followed by constraints ($\beta = -.23, p < .0001$), and gender ($\beta = -.10, p < .05$). Age and motivation were not significantly related to duration.

Discussion

The Role of Age and Gender on Leisure Constraints

Previous research has suggested that age may be related to constraints. For example, researchers have shown that intrapersonal constraints increase with age (Alexandris & Carroll,

1997; Searle & Jackson, 1985) whereas financial constraints decrease with age (Jackson, 1993). However, the relationship between overall levels of constraints (rather than type) and age has not been examined previously (Alexandris et al., 2003). In the present study, age was not significantly related to overall constraints levels, although the direction of the relationship was negative. This finding indicates that perceived constraints are not higher for older adults as compared to middle-aged adults. Additional research might examine this possible relationship with a more age-diverse sample to determine its generalizability.

Similar to Alexandris et al.'s finding (2003), there was no evidence of gender differences in constraints in this sample of adults aged 50 and older. These findings contrast with Jackson and Henderson's (1995) findings of gender differences in a survey of Canadian adults aged eighteen and older. In contrast to their study, mean sub-scale scores for intrapersonal, interpersonal and structural constraints were used in this study rather than sub-scales based on a different conceptualization of constraints or individual item scores. Therefore, an examination of the individual items, or sub-scales based on an alternative conceptualization, might have yielded a different result. Further research with a more representative sample of older adults in the U.S. would also be useful to more fully examine possible gender differences in leisure constraints later in life.

Determining the Mediating Influence of Negotiation Strategies on Constraints and Motivation

Unlike previous research (Hubbard & Mannell, 2001), the results of this study did not find support for negotiation as a mediator of the relationship between constraints and overall physically active leisure or its frequency and duration subdimensions. This lack of relationship suggests that the middle-aged and older adults in this sample did not follow the same process of

constraint negotiation as did the workplace respondents in Hubbard and Mannell's study. Counter to the expectation set forth in Jackson et al.'s (1993) first proposition, in this study constraints were strongly and directly related to participation but were not significantly related to negotiation strategies. Perhaps people 50 and older have already gone through the process of identifying and utilizing negotiation strategies to overcome some of the specific constraints they have faced earlier in their lives. Hence, the constraints that continue to limit participation may be unrelated to the negotiation strategies utilized. Future research should focus on trying to determine the constraint negotiation processes for people across the lifespan. Understanding this process holds promise for helping to inform leisure education and health promotion programs to enhance physically active leisure. Further, exploration of the dynamic process of constraints, negotiation and motivation across the lifespan may reveal important distinctions by sex and age that will provide insight into the best ways to develop, implement and evaluate programming.

Hubbard and Mannell's (2001) finding that negotiation fully mediated the relationship between motivation and frequency of participation was maintained in this study, even when controlling for the effects of age and gender. However, negotiation only partially mediated the relationship between motivation and overall physically active leisure, suggesting that motivation has a direct influence on participation when participation reflects intensity levels. Hence, including intensity levels in the measurement of physical activity leads to the conclusion that motivation is directly related to participation whereas using a simpler, unidimensional measure such as frequency leads to the conclusion that motivation is only indirectly related to participation. Even so, the indirect effects of motivation through negotiation significantly influenced both the multidimensional measure of physical activity and the frequency subdimension. Motivation for physically active leisure was strongly and positively related to

negotiation strategies, which in turn were positively related to both overall physical activity levels and frequency levels over the past seven days. More specifically, high levels of motivation to participate in physically active leisure for pleasure and health led to increased engagement in self-directed negotiation strategies, which increased the levels of overall physically active leisure, particularly in the case of frequency of participation. Altogether, these findings highlight the need to continue to refine constraints negotiation theory to incorporate the nuances of multiple measures of physically active leisure. They also underscore the importance of finding ways not only to enhance but to sustain motivations to engage in physically active leisure, which is an important charter in the development of effective leisure education and health promotion programs.

Determining the Mediating Influence of Frequency on the Relationships of the Predictors to Duration

As expected, frequency levels in the past week were highly associated with duration of participation over the past week. Not surprisingly, as the number of days of participation in the past week increased, so did the number of hours of participation in the same time period. In addition, frequency fully mediated the relationship of constraints, negotiation, and gender to duration, underscoring the importance of assessing the possible ways that the subdimensions of physical activity are related to each other and to different explanatory variables. Constraints and negotiation strategies affected the frequency of participation, with constraints decreasing, and negotiation strategies increasing, the number of days of leisure-based physical activity participation. Weekly frequency, in turn, was strongly associated with the number of hours spent participating. It seems that as long as negotiation strategies exert a stronger influence on

frequency levels than do constraints, duration levels will increase as well. In addition, women's lower levels of frequency fully accounted for their lower duration levels. These findings suggest that different strategies might need to be used to increase the frequency of participation as compared to the duration of activity. These findings also suggest that leisure education and health promotion programming to increase physically active leisure should focus more attention on ways to help people develop and implement negotiation strategies to participate in physically active leisure on a more frequent basis. However, caution should be exercised until similar findings are maintained with a representative sample of middle-aged and older adults to lend further support to these conclusions.

Although the importance of physical activity as a contributor to positive health outcomes is widely accepted (CDC, 2004; Center for the Advancement of Health [CAH], 2006), there is less understanding as to the way in which the subdimensions (i.e., frequency, duration, and intensity) of physically active leisure interact to contribute to health outcomes. A few studies are suggestive. For example, Lee, Sesso, and Paffenbarger (2000) found that duration no longer predicted lower coronary heart disease risk once total energy expended (intensity) and other confounders were controlled. And, Green and Crouse (1995) conducted a meta-analysis and found that duration was one factor that significantly increased functional capacity in older adults. The present study also points to the importance of looking at physical activity subdimensions as explanatory variables: frequency was both an outcome and a mediator of leisure constraints and negotiation. Thus, extending the constraint negotiation model to include these subdimensions as predictors and health factors as outcomes will be an important task for future research.

Unique Contributions to Physically Active Leisure

The current study revealed that age, gender, constraints, negotiation, and motivation were all significant independent contributors to overall levels of physically active leisure. However, only gender, constraints and negotiation were significant independent contributors to the frequency subdimension. Negotiation was the most important independent contributor to overall physically active leisure whereas constraints was the most influential contributor to the frequency subdimension. In both cases, these two factors provided countervailing forces on participation; constraints decreased levels of participation while negotiation strategies increased them. In contrast to Hubbard and Mannell's (2001) research but consonant with Alexandris and Carroll's (1997) findings, motivation was a significant independent contributor to overall physically active leisure in this study, even when controlling for the effects of age, gender, constraints, and negotiation. Additionally, although motivation was no longer a direct contributor to frequency and duration once the other factors in the model were included, motivation remained significantly related to frequency of participation through negotiation strategies. These findings underscore the importance of motivation level in increasing physically active leisure and support the continued study of motivations in future constraints negotiation research (e.g., Jackson et al., 1993; Mannell & Loucks-Atkinson, 2005). Taken altogether, these findings indicate that leisure service organizations should focus on both the motivation and negotiation strategies of its participants before, during and after implementing physical activity health promotion programs. Moreover, program directors might try discussing and reinforcing benefits-based motivations (expectations about the benefits of participation) and negotiation strategies in support of participation efforts.

Gender was a significant independent contributor to both overall physically active leisure and the frequency subdimension. Similar to previous research (Rhodes et al., 1999; Stanley & Freysinger, 1995), women had lower levels of physically active leisure. Age was also a significant and positive contributor to overall physically active leisure but not for the frequency or duration subdimensions. The finding of a positive relationship between age and overall physical activity contrasts with most research indicating that age has a negative influence on physical activity (CDC, 2000b; Rhodes et al., 1999; Stanley & Freysinger, 1995). This finding may have resulted from the truncated age range of the participants in this study. For instance, instead of comparing cross-sections of younger and older age populations, this study utilized a convenience sample of people 50 and older. Perhaps middle-aged and older adults are not particularly distinct in terms of physically active leisure. Additionally, this finding might be explained in part by the fact that this was a sample of park volunteers and park visitors and, therefore, may have consisted of more active older adults than what one might find in the general population. This finding also may have resulted because physically active leisure was broadly defined to include gardening and yard work. The main criterion for designation as physically active leisure was that these activities occurred during one's free time, apart from work and volunteering. Perhaps the inclusion of activities that were both pleasurable and instrumental, but were still fundamentally viewed as leisure time activities by the respondents, provided a more accurate portrayal of the relationship between age and participation. Researchers interested in physically active leisure might want to ask their respondents to discuss leisure activities that are both pleasurable and instrumental to further elucidate this possibility.

Of note was the finding that age influenced the combined effects of frequency, duration and intensity while failing to affect its frequency and duration subdimensions. The PASE score,

which is weighted across frequency, duration and intensity has been shown to be a robust multidimensional measure of physically active leisure, both reliable and valid in different older adult population samples (Martin et al., 1999; Washburn et al., 1993; Washburn et al., 1999). However, the PASE measures of frequency and duration were ordinally scaled rather than intervally scaled, which did not allow for the highest level of measurement of the days and hours of activity per week. Moreover, multidimensional measures of the frequency, duration and intensity subdimensions are not available but may prove useful. Future scales should try to enhance the measurement of the subdimensions of physically active leisure, thereby increasing the accuracy, interpretability and practicality of results.

Conclusions

The purpose of the current study was to try to understand the relationships between age, gender, leisure constraints, leisure negotiation, motivation, and physically active leisure. While this study has provided some insights into the role of constraint negotiation on physically active leisure, it has also generated additional questions. For example, although this study did not find a significant relationship between constraints and negotiation, it is still unclear whether or not negotiation might explain, at least in part, the relationship between constraints and physically active leisure for other age-distinct, age-diverse, or racially and ethnically diverse samples. In addition, the role of motivation on participation appears to depend on how participation is measured; motivation was directly and indirectly related to overall physical activity but only indirectly related to the frequency subdimension. Will these results maintain in other samples, or with other measures of physically active leisure? It is also unknown whether or not age and

gender might relate to perceived constraints in other samples, particularly in a representative sample of people 50 and older.

The results of this study suggest that replication studies of the Hubbard and Mannell model of physically active leisure should control for the effects of age and gender. Moreover, there are many other factors known to influence physical activity, including health, race/ethnicity, and socioeconomic status, just to name a few. Future research should continue to validate and to extend Hubbard and Mannell's model to include such factors to advance the current state of knowledge on the constraint negotiation process.

The use of middle-aged and older park volunteers and park visitors had advantages and disadvantages in this study. One of the advantages of using this convenience sample for the current study was the ability to target potential older participants through the mail, to utilize volunteer meetings to recruit older adults, and to conduct the study during special events that appealed to middle-aged and older adults. This recruitment strategy resulted in the ability to study the effects of age, gender, constraints, negotiation, and motivation in later life physically active leisure, an area currently understudied. The study findings provided support for the generalizability of constraint negotiation theory to middle-aged and older adults, particularly the influence of constraints and the motivation-negotiation process. On the other hand, a disadvantage of using this sample was the homogeneity of the respondents, most notably in terms of race/ethnicity. Given the fact that racial and ethnic minorities tend to have lower rates of leisure time physical activity than whites (Eyler et al., 2002; Wilcox, 2002), future studies should try to obtain a greater representation of people from different racial and ethnic backgrounds to determine whether or not these models of physically active leisure may be applied more broadly.

References

- Alexandris, K., & Carroll, B. (1997). An analysis of leisure constraints based on different recreational sport participation levels: Results from a study in Greece. *Leisure Sciences, 19*, 1-15.
- Alexandris, K., Tsorbatzoudis, C., & Grouios, G. (2002). Perceived constraints on recreational sport participation: Investigating their relationship with intrinsic motivation, extrinsic motivation and Amotivation. *Journal of Leisure Research, 34*(3), 233-252.
- Alexandris, K., Barkoukis, V., Tsorbatzoudis, H., & Groulos, G. (2003). A study of perceived constraints on a community based physical activity program for the elderly in Greece. *Journal of Aging and Physical Activity, 11*(3), 305-318.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*, 238-246.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York, NY: Wiley.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 445-455). Newbury Park, CA: Sage.
- Byrne, B. M. (2001). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Carmines, E. G., & McIver, J. P. (1981). Analyzing models with unobserved variables: Analysis of covariance structures. In G. W. Bohrnstedt and E. F. Borgatta (Eds.), *Social measurement: Current issues* (pp. 65-115). Beverly Hills, CA: Sage.
- Carroll, B., & Alexandris, K. (1997). Perception of constraints and strength of motivation:

- Their relationship to recreational sport participation in Greece. *Journal of Leisure Research*, 29(3), 279-299.
- CDC. (1997). Monthly estimates of leisure-time physical inactivity—United States, 1994. Retrieved April 3, 2006, from <http://www.cdc.gov/mmwr/preview/mmwrhtml/00047596.htm>
- CDC. (2000a). Behavioral Risk Factor Surveillance System (BRFSS). Retrieved March 22, 2005, from <http://apps.nccd.cdc.gov/dnpa/piRec.asp?piState=us&PiStateSubmit=Get+Stats>
- CDC. (2000b). Behavioral Risk Factor Surveillance System (BRFSS). Retrieved March 22, 2005, from <http://www.cdc.gov/nccdphp/dnpa/physical/stats/tainacage.htm>
- CDC. (2004). The state of aging and health in America 2004. Retrieved May 29, 2006, from http://www.cdc.gov/aging/pdf/State_of_Aging_and_Health_in_America_2004.pdf
- Center for the Advancement of Health. (CAH) (2006). A new vision of aging: Helping older adults make healthier choices. Retrieved March 9, 2006, from <http://www.cfah.org/pdfs/agingreport.pdf>
- Chandler, J. M., & Hadley, E. C. (1996). Exercise to improve physiologic and functional performance in old age. *Clinics in Geriatric Medicine*, 12, 761-784.
- Courneya, K. S., & McAuley, E. (1994). Are there different determinants of the frequency, intensity, and duration of physical activity? *Behavioral Medicine*, 20(2), 84-90.
- Crawford, D. W., & Godbey, G. C. (1987). Reconceptualizing barriers to family leisure. *Leisure Sciences*, 9, 119-127.
- Crawford, D., Jackson, E., & Godbey, G. (1991). A hierarchical model of leisure constraints. *Leisure Sciences*, 13, 309-320.
- Eyler, A. E., Wilcox, S., Matson-Koffman, D. M., Evenson, K. R., Sanderson, B., Thompson, J.,

- et al. (2002). Correlates of physical activity among women from diverse racial/ethnic groups. *Journal of Women's Health & Gender-Based Medicine*, 11(3), 239-253.
- Graham, J. W., Cumsille, P. E., & Elek-Fisk, E. (2003). Methods for handling missing data. In J.A. Schinka & W. F. Velicer (Eds.), *Research methods in psychology* (pp. 87-114). Volume 2 of the *Handbook of psychology* (I. B. Weiner, Editor-in-Chief). New York: John Wiley & Sons.
- Green, J. S., & Crouse, S. F. (1995). The effects of endurance training on functional capacity in the elderly: A meta-analysis. *Medicine and Science in Sports and Exercise*, 27(6), 920-926.
- Hawkins, B. A., Peng, J., Hsieh, C., & Eklund, S. J. (1999). Leisure constraints: A replication and extension of construct development. *Leisure Sciences*, 21, 179-192.
- Hu, L. T., & Bentler, P. M. (1995). Evaluating model fit. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 76-99). Thousand Oaks, CA: Sage.
- Hubbard, J., & Mannell, R. (2001). Testing competing models of the leisure constraint and negotiation process in a corporate employee recreation setting. *Leisure Sciences*, 23, 145-163.
- Iso-Ahola, S. E. (1999). Motivational foundations of leisure. In E. L. Jackson & T. L. Burton (Eds.), *Leisure studies: Prospects of the twenty-first century* (pp. 35-51). State College, PA: Venture.
- Jackson, E. L. (1993). Recognizing patterns of leisure constraints: Results from alternative analyses. *Journal of Leisure Research*, 25, 129-149.
- Jackson, E. L. (2000). Will research on leisure constraints still be relevant in the twenty-first

- century? *Journal of Leisure Research*, 32(1), 62-68.
- Jackson, E. L., & Henderson, K. A. (1995). Gender-based analysis of leisure constraints. *Leisure Sciences*, 17(1), 31-51.
- Jackson, E. L., Crawford, D. W., & Godbey, G. (1993). Negotiation of leisure constraints. *Leisure Sciences*, 15, 1-11.
- Kay, T., & Jackson, E. (1991). Leisure despite constraint: The impact of leisure constraints on leisure participation. *Journal of Leisure Research*, 23, 301-313.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: Guilford Press.
- Kriska, A. M., Knowler, W. C., LaPorte, R. E., Drash, A. L., Wing, R. R., Blair, S. N., et al. (1990). Development of a questionnaire to examine the relationship of physical activity and diabetes in Pima Indians. *Diabetes Care*, 13, 401-411.
- Lee, I. M., Paffenbarger, R. S., & Hennekens, C. H. (1997). Physical activity, physical fitness and longevity. *Aging*, 9, 2-11.
- Lee, I. M., Sesso, H. D., & Paffenbarger, R. S. (2000). Physical activity and coronary heart disease risk in men: Does the duration of exercise episodes predict risk? *Circulation*, 102(9), 981-986.
- Mannell, R. C., & Kleiber, D. A. (1997). *Social psychology of leisure*. State College, PA: Venture.
- Mannell, R. C., & Loucks-Atkinson, A. (2005). Why don't people do what's "good" for them? Cross-fertilization among the psychologies of nonparticipation in leisure, health, and exercise behaviors. In E. L. Jackson (Ed.), *Constraints to leisure*, (pp. 221-232). State College, PA: Venture.

- Mannell, R. C., & Zuzanek, J. (1991). The nature and variability of leisure constraints in daily life: The case of the physically active leisure of older adults. *Leisure Sciences, 13*, 337-351.
- Marsh, H. W., Hau, K., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling, 11*(3), 320-341.
- Martin, K. A., Rejeski, W. J., Miller, M. E., James, M. K., Ettinger, Jr., W. H., & Messier, S. P. (1999). Validation of the PASE in older adults with knee pain and physical disability. *Medicine & Science in Sports & Exercise, 31*(5), 627-633.
- McGuire, F. A., Dottavio, F. D., & O'Leary, J. T. (1986). Constraints to participation in outdoor recreation across the life span: A nationwide study of limitors and prohibitors. *The Gerontologist, 26*(5), 538-544.
- Morgan, K., & Bath, P. A. (1998). Customary physical activity and psychological wellbeing: A longitudinal study. *Age and Ageing, 27*(S3), 35-40.
- New England Research Institutes, Inc. (NERI). (1991). PASE: Physical Activity Scale for the Elderly. Watertown, MA: NERI.
- Oguma, Y., Sesso, H.D., Paffenbarger, R.S., & Lee, I.M. (2001). Physical activity and all cause mortality in women: A review of the evidence. *British Journal of Sports Medicine, 36*, 162-172.
- Patterson, I., & Chang, M. L. (1999). Participation in physical activity by older Australians: A review of the social psychological benefits and constraints. *Australian Journal on Ageing, 18*(4), 179-185.

- Raymore, L., Godbey, G., Crawford, D., & von Eye, A. (1993). Nature and process of leisure constraints: An empirical test. *Leisure Sciences, 15*, 99-113.
- Rhodes, R. E., Martin, A. D., Taunton, J. E., Rhodes, E. C., Donnelly, M., & Elliott, J. (1999). Factors associated with exercise adherence among older adults: An individual perspective. *Sports Medicine, 28*(6), 397-411.
- Samdahl, D. M., & Jekubovich, N. J. (1997). A critique of leisure constraints: Comparative analyses and understandings. *Journal of Leisure Research, 29*(4), 430-452.
- Searle, M., & Jackson, E. (1985). Recreation non-participation and barriers to participation: Considerations for the management of recreation delivery systems. *Journal of Park and Recreation Administration, 3*, 23-35.
- Scott, D. (1991). The problematic nature of participation in contract bridge: A qualitative study of group-related constraints. *Leisure Sciences, 13*, 321-336.
- Shaw, S. M., Bonen, A., & McCabe, J. (1991). Do more constraints mean less leisure? Examining the relationship between constraints and participation. *Journal of Leisure Research, 23*, 286-300.
- Shaw, S. M., & Henderson, K. (2005). Gender analysis and leisure constraints: An uneasy alliance. In E. L. Jackson (Ed.), *Constraints to leisure*, (pp. 23-34). State College, PA: Venture.
- Shephard, R. J. (1997). *Aging, physical activity, and health*. Champaign, IL: Human Kinetics.
- Stanley, D., & Freysinger, V. J. (1995). The impact of age, health, and sex on the frequency of older adults' leisure activity participation: A longitudinal study. *Activities, Adaptation and Aging, 19*(3), 31-42.
- Washburn, R. A., & Ficker, J. L. (1999). Physical Activity Scale for the Elderly (PASE): The

- relationship with activity measured by portable accelerometer. *Journal of Sports Medicine and Physical Fitness*, 39, 336-340.
- Washburn, R. A., McAuley, E. Katula, J., Mihalko, S. L., & Boileau, R. A. (1999). The Physical Activity Scale for the Elderly (PASE): Evidence for validity. *Journal of Clinical Epidemiology*, 52(7), 643-651.
- Washburn, R. A., Smith, K. W., Jette, A. M., & Janney, C. A. (1993). The physical activity scale for the elderly (PASE): Development and evaluation. *Journal of Clinical Epidemiology*, 15, 3-162.
- Wilcox, S. (2002). Physical activity in older women of color. *Topics in Geriatric Rehabilitation*, 18(1), 21-33.

Orientation to Chapter 4

Chapter 4 is written as a stand-alone manuscript to be later submitted in consideration for publication in a peer-reviewed journal. In terms of the dissertation research questions and hypotheses, the original purpose of Chapter 4 was to explore the following:

- RQ1. Is SOC positively related to physical activity participation?
- RQ4. When controlling for age and gender, do constraints influence SOC?
- RQ7. When controlling for age, is there an interaction between SOC and motivation on negotiation strategies?
- RQ8. When controlling for age, is there an interaction between SOC and motivation on physical activity participation?
- RQ9. Is there a good fitting model of the relationships between SOC, constraints, negotiation strategies, motivation, age, gender, and physical activity participation?
- H1. Age will be negatively related to SOC.

One aim of the Chapter 4 study was to propose and to evaluate the goodness of fit of a model of SOC, age and gender in the constraint negotiation process for physically active leisure in later life (RQ9). First, an examination of the interactive effects of SOC and motivation on negotiation (RQ7) and on multiple measures of physically active leisure (RQ8) required consideration to contribute to the model development. The findings of this preliminary examination suggested that the current study should focus on a description of the significant interactive effects and that a future study is warranted to examine possible alternative models of the constraint negotiation process that incorporate SOC, age, gender and multiple dimensions of

physically active leisure. Therefore, RQ9 will not be addressed as originally proposed. All other research questions and hypotheses above will be addressed.

CHAPTER 4:
WHAT IS THE ROLE OF SELECTIVE OPTIMIZATION WITH COMPENSATION
(SOC) IN LATER LIFE LEISURE-TIME PHYSICAL ACTIVITY?

Abstract

The purpose of this study was to examine the relationships between selective optimization with compensation (SOC), motivation, constraint negotiation, and physical activity in later life. One objective was to test the interactive effect of SOC and motivation on the negotiation strategies utilized to overcome constraints to physical activity participation. Another objective was to test the interactive effect of SOC and motivation on multiple measures of leisure-time physical activity (frequency, duration, and a composite of these factors with intensity), while controlling for age, gender, constraints, and negotiation. There were significant interactions between SOC and motivation for negotiation strategies and physical activity duration. These results are discussed in terms of their implications for health promotion programs to increase the leisure-time physical activity of people 50 and older.

Introduction

Physical activity in later life reduces mortality (Lee, Paffenbarger, & Hennekens, 1997; Oguma, Sesso, Paffenbarger, & Lee, 2001), improves functional fitness and functional abilities (Chandler & Hadley, 1996; Shephard, 1997), improves mental health (Morgan & Bath, 1998; Patterson & Chang, 1999), lowers the risk for dementia (Farbrigoule, Letenneur, & Dartigues, 1995), and improves cognitive function (Weuve et al., 2004). However, older adults participate in the lowest levels of physical activity across age groups (Centers for Disease Control and Prevention [CDC], 2000), with an estimated one-third of middle-aged and older adults participating in no leisure-time physical activity (U.S. Department of Health & Human Services, 1996).

The Center for the Advancement of Health [CAH] (2006) has highlighted the multitude of constraints that older adults face in starting and maintaining a physical activity program and has underscored the importance of motivating older adults to participate in physical activities. However, little is known about the possible ways that middle-aged and older adults' general life management strategies may affect their physical activity participation. To begin with, it is not clear whether or not general life management strategies influence physical activity at all. Second, there is a lack of information about the possible relationships between general life management strategies and the physical activity subdimensions, frequency and duration. There is also a dearth of information about whether or not general life management strategies influence constraints to physical activity or the specific strategies people utilize to overcome such constraints.

The present study used the theoretical frameworks of selective optimization with compensation (SOC) (Baltes & Baltes, 1990; Baltes & Carstensen, 1996, 1999) and perceived

constraints and negotiation (Crawford, Jackson, & Godbey, 1991; Hubbard & Mannell, 2001; Jackson, Crawford, & Godbey, 1993) to examine middle-aged and older adults' physical activity participation. Of particular interest was whether or not general life management strategies (SOC) interacted with motivation to influence physical activity participation as well as the specific strategies older adults used to overcome constraints.

Study Background

Leisure Constraints and Negotiation Strategies

Barriers have been proposed as one explanation for physical activity participation (e.g., Sallis & Hovell, 1990). In fact, there is a growing body of research in the exercise psychology and public health literature evidencing the association between perceived barriers and physical activity in later life. For instance, some researchers have found that social and physical environmental factors are associated with later life physical activity (Addy et al., 2004; Zlot, Librett, Buchner, & Schmid, 2006) while others have found that personal barriers play a role in participation as well (King et al., 2000; Lees, Clark, Nigg, & Newman, 2005; Wilcox, Castro, King, Housemann, & Brownson, 2000). Although this research suggests that multifold personal, social and environmental barriers influence the physical activity of older adults, the development of comprehensive scales to examine these wide ranging barriers in a systematic way have been absent. Further, most of these studies rely on associations rather than prediction (see Zlot et al., 2006, as an exception) or model development.

Dishman (2001) and Rhodes et al. (1999) have suggested that more information is needed on the process in which perceived barriers affect physical activity participation across the

lifespan. Leisure researchers have utilized a hierarchical model of leisure constraints that may be helpful toward this aim. Leisure constraints are factors that either preclude or limit participation in desired leisure activities (Crawford & Godbey, 1987; Crawford et al., 1991); hence, they are synonymous with “barriers” as conceptualized by exercise psychology and public health researchers. The three overarching types of constraints are intrapersonal, interpersonal and structural constraints. Intrapersonal constraints are within the individual (i.e., personal barriers), such as lack of self-efficacy, shyness, and physical limitations. Interpersonal constraints pertain to social interactions (i.e., social barriers); for example, conflicting schedules with a desired activity partner. Structural constraints are features of the environment (i.e., environmental barriers), such as lack of low-cost options and neighborhood safety. The leisure constraints hierarchical model indicates that intrapersonal constraints are proximal, interpersonal constraints are medial, and structural constraints are distal. Therefore, intrapersonal constraints must be addressed prior to interpersonal constraints which, in turn, must be addressed prior to structural constraints. Raymore, Godbey, Crawford and von Eye (1993) empirically tested the hierarchical model of leisure constraints, finding support for this proximal to distal process.

Crawford et al.’s (1991) original conceptualization of the hierarchical constraints model maintained that people negotiate each level of constraints to participate in physical activity. In a further elaboration of the model, Jackson et al. (1993) proposed several ways that people may utilize negotiation strategies to overcome constraints to participation. They also pointed to negotiation as an explanation for why constraints are not always insurmountable obstacles to participation. In fact, people may have higher levels of physical activity participation even when confronted with higher levels of constraints (Shaw, Bonen, & McCabe, 1991). Physical activity constraints may prompt higher utilization of negotiation strategies (Hubbard & Mannell, 2001;

Shaw et al., 1991), although it is unclear whether or not this process occurs in older adults (see Chapters 2 and 3). Negotiation strategies include time management, skill acquisition, financial strategies, and interpersonal coordination (Hubbard & Mannell, 2001). For example, a time management strategy might entail getting up earlier or staying up later to make time to participate whereas an interpersonal strategy might be asking for help with the necessary skills to participate in a new physical activity. In support of a participation model based on constraints and negotiation strategies, Hubbard and Mannell (2001) found that constraints positively influenced the utilization of negotiation strategies which, in turn, positively influenced physical activity participation.

Selective Optimization with Compensation (SOC)

SOC theory (Baltes & Baltes, 1990; Baltes & Carstensen, 1996, 1999, 2003) suggests that people utilize goal-oriented life management strategies to deal with increasing functional loss across the lifespan due to inevitable age-related declines. These strategies depend upon person-environment interactions, resource availability, and fluctuations in gains and losses over the lifespan (Freund, Li, & Baltes, 1999). Overall, it appears that SOC increases from young to middle adulthood and then decreases in old age (Freund & Baltes, 2002). This finding suggests that middle-aged adults utilize the highest levels of SOC strategies compared to both younger and older adults.

According to SOC theory, there are three primary strategies that people may use to adapt to their life circumstances: selection, optimization, and compensation. Selection pertains to the identification, prioritization, and commitment to goals. Goal selection may be elective-based, chosen without any other considerations besides one's desire to attain it (Freund et al., 1999). A

selection strategy may also be loss-based, chosen in response to the loss of personal and/or environmental resources. Loss-based selection often leads to the selection of a new or modified goal due to changes in one's life circumstances; it is therefore reactive (Freund et al., 1999). An example of elective-based selection is committing oneself to one or two desired goals whereas an example of a loss-based selection is choosing a different goal due to a limitation. Optimization refers to maximizing gains through personal and external resources to accomplish desired goals (Baltes & Carstensen, 1996; Freund et al., 1999). Making every effort to achieve a desired goal and continuing to work toward a goal until achieving success are examples of optimization. Compensation refers to the utilization of resources in an effort to maintain functioning in the face of limitations (Freund et al., 1999). Finding alternative ways of accomplishing an outcome, such as relying on others for help, is a common compensation strategy.

As may be clear from these examples of selection, optimization and compensation, the conceptualization and operationalization of SOC has focused on the general, overarching life management strategies that people may use to adapt to age-related declines. These general strategies contrast with the specific negotiation strategies people utilize to overcome constraints within the leisure domain. However, it is possible that general SOC life management strategies may relate to specific negotiation strategies to participate in leisure-time physical activity. For instance, a physical activity negotiation strategy related to loss-based selection might be to walk three days a week instead of running because of persistent knee pain. A physical activity negotiation strategy related to optimization might be to spend more time at the pool doing laps, as opposed to doing land-based physical activities, to maximize performance in an upcoming master's swimming competition. And, a physical activity negotiation strategy related to

compensation to mobility limitations might be using assistive floatation devices to continue swimming.

Research (Janke & Davey, 2004; Lang, Rieckmann, & Baltes, 2002; Oh, 2005; Ryan, Anas, Beamer, & Bajorek, 2003) has suggested that SOC may contribute positively to successful aging in diverse leisure contexts. However, there is little research that addresses the importance of SOC as a general life management strategy for enhancing health promoting leisure behaviors, such as leisure-time physical activity. There is also little research on the possible relationship between these broad goal-directed life management strategies, leisure-time physical activity constraints, and more specific negotiation strategies to overcome constraints. For example, it is unknown whether or not people with high levels of constraints will be more likely to utilize SOC strategies, just as they are more likely to utilize negotiation strategies (Hubbard & Mannell, 2001). It is also unclear whether or not general SOC strategies relate to specific negotiation strategies, although it seems reasonable that they might be.

Motivation and SOC

Motivation has been identified as a key component to the successful physical activity participation of middle-aged and older adults (CAH, 2006; Carroll & Alexandris, 1997; National Blueprint, 2002; Wilcox & Storaandt, 1996). Hubbard and Mannell (2001) have also highlighted how motivation and the negotiation strategies people use to overcome constraints are related to leisure-time physical activity; motivation had an indirect effect on physical activity through negotiation strategies. Aside from this study, there has been little research on the role of motivation in the context of strategies to participate in physical activity in spite of constraints, although motivation has been shown to be an important factor for participation in diverse leisure

activities and settings (see Iso-Ahola, 1999 and Mannell & Kleiber, 1997 for reviews). Mannell and Loucks-Atkinson (2005) have argued that motivation should be a key component in the study of leisure constraints and negotiation. Based on Hubbard and Mannell's (2001) findings, this area of research appears to be a promising avenue to pursue in trying to understand physical activity participation.

In addition to gaining a better understanding of the relationships between motivation, negotiation and physical activity, it is also important to understand the way that SOC may interact with motivation to influence both negotiation strategies and physical activity participation. Although SOC life management strategies may relate to specific negotiation strategies directly, it seems plausible that motivation may moderate this relationship. There might be a stronger relationship between general SOC life management strategies and specific negotiation strategies to overcome physical activity constraints for more motivated people than for less motivated people. Similarly, motivation may moderate the relationship between SOC and physical activity. SOC strategies might relate more strongly to physical activity for highly motivated people.

Physical Activity Multidimensionality

The majority of studies on leisure-time physical activity have utilized single measures of physical activity (see Shaw et al., 1991 as an exception), such as frequency of participation in the past week, month, or year (Alexandris & Carroll, 1997; Alexandris, Barkoukis, Tsorbatzoudis, & Grouios, 2003; Hubbard & Mannell, 2001) or duration of participation (Mannell & Zuzanek, 1991), thereby precluding the concurrent exploration of the possible relationships between frequency, duration and various explanatory variables. However, it seems possible that

motivation may contribute differently to frequency and duration of physical activity. For example, motivation to participate in physical activity might have more influence on frequency of participation but relatively little influence on duration. Unfortunately, studies assessing multidimensional aspects of physical activity have not assessed the role that motivation might play (see Courneya & McAuley, 1994 as an exception) and studies that include motivation do not utilize multiple measures of physical activity (Alexandris, Tsorbatzoudis, & Grouios, 2002; Carroll & Alexandris, 1997; Hubbard & Mannell, 2001). The possible relationships between the interactive effect of SOC and motivation on multidimensional measures of leisure-time physical activity are unknown. It is also unclear whether or not general SOC strategies and specific negotiation strategies differentially influence these measures of leisure-time physical activity and, if so, how.

Utilizing multidimensional measures of physical activity may lead to more a more accurate depiction of the relative importance of explanatory factors on different types of physical activity participation. Revealing the patterns of the relationships for overall levels of physical activity and its frequency and duration subdimensions might reveal distinctions that could contribute to the better design and implementation of programs intended to increase physical activity participation.

Study Purpose and Research Objectives

The purpose of this study was to examine the relationships between selective optimization with compensation (SOC), motivation, negotiation, and physical activity in later life. There were three primary objectives of this study: 1) to test the interactive effect of SOC and motivation on negotiation; 2) to test the interactive effect of SOC and motivation on a

multidimensional measure of leisure-time physical activity, while controlling for constraints, negotiation, age and gender; and 3) to determine whether or not these relationships differed by frequency and duration, while accounting for the effect of frequency on duration.

Methods

Respondents

Two-hundred seventy-five volunteers and visitors of a park district in a Midwestern metropolitan city aged fifty and older comprised the sample. Four cases were omitted based on outlying physical activity scores, resulting in a total sample of two-hundred seventy-one.

Respondents ranged in age from 50 to 87 years old, with a mean age of 63.4 years ($SD = 8.9$). Most respondents were female (60%), married (64%), and Caucasian (96%). Fifty-five percent of the respondents were retired, thirty percent worked full-time, and eleven percent worked part-time. Approximately half (51%) of the sample had a college or university education, with 27% attaining graduate-level or professional degrees. Nearly half of the sample had a household income of \$50,000 or more (45%).

Procedure

Individuals were asked to complete an on-site self-administered questionnaire in September, 2005, during two community-wide, free special events held by the park district as well as volunteer sessions with park volunteers at five park district offices. Respondents were unpaid volunteers but were offered incentives such as complimentary refreshments, door prizes (food baskets), and raffle prizes (restaurant, book store, and movie gift certificates).

Respondents were also given the option to take the questionnaire home and to return it in a postage-paid return addressed envelope. See Chapters 2 and 3 for further details.

Measures

The independent variables of interest in this study were selective optimization and compensation, motivation and their interaction. Dependent variables were negotiation, overall leisure-time physical activity, frequency, and duration. The control variables for the research questions pertaining to physical activity were constraints, negotiation, age and gender. Table 4.1 provides examples of the items used to measure the variables of interest.

Selective optimization with compensation. The Short Version SOC Questionnaire (Baltes, Baltes, Freund, & Lang, 1995) was modified to measure SOC-based life management strategies. It contains 24 statements, with 12 target items and 12 distractor items (12 statement pairs). There were three items for each of the following domains: elective-based selection, loss-based selection, optimization, and compensation. The questionnaire was modified from a Person A/Person B format to an either/or statement pair format. Participants were asked to select which of the two statements (target or distractor) described them better, and were instructed to go to the next statement pair if neither statement applied to them. Responses were coded as (1) SOC (SOC selected or both SOC and distractor selected) and (0) not SOC (distractor selected or neither statement selected). A nine-item SOC index, omitting two elective-based selection items (concentrate energy, focus on one goal) and one loss-based selection item (choose one or two important goals when things don't go well), had adequate internal consistency, with a coefficient alpha of .72. Mean SOC scores using these nine items were calculated for each respondent ($M = .59, SD = .25$).

Table 4.1 Examples of Items Used to Measure the Components of SOC, Motivation, Negotiation, and Constraints

<i>Selective optimization with compensation (SOC)</i>	
Elective-based selection	I concentrate all my energy on a few things. I always focus on the one most important goal at a given time.
Loss-based selection	When things don't go as well as before, I choose one or two important goals.
Optimization	I make every effort to achieve a given goal. I keep working on what I have planned until I succeed.
Compensation	When something doesn't go as well as it used to, I keep trying other ways of doing it until I can achieve the same result I used to. When something in my life isn't working as well as it used to, I ask others for advice or help.
<i>Motivation</i>	
	I participate or would like to participate in recreation, sport or fitness activities for my own immediate enjoyment or pleasure. I participate or would like to participate in recreation, sport or fitness activities because it is good for my health.
<i>Negotiation</i>	
	I try to learn new activities. I try to be organized. I try to budget my money. I try to improve my skills. I ask my family to share in the daily chores. I do more recreation, sport or fitness activities close to home. I prioritize what I want to do, and make recreation, sport or fitness a priority. I ask for help with the required skills. I cut short the activity session time. I sometimes substitute another more convenient activity for a preferred one. I participate in activities with people of the same gender. I try to meet people with similar interests. I practice the required skills on my own.
<i>Constraints</i>	
	I would do an activity that my friends thought was alright. I won't do another activity if I have other commitments. The people with whom I would participate have different work or volunteer schedules than me. I would do an activity that doesn't make me feel self-conscious. I have a chronic illness or disability that prevents me from participating. I would do an activity if the facilities I need are not crowded. The people I know usually don't have time to start an activity with me. I am afraid of getting hurt. I am not in good enough shape to participate. I don't have the right clothes or equipment to participate.

Two cases were not ascertainable for the twelve statement pairs, resulting in missing data for these two scores.

Motivation. The two motivation items from Hubbard and Mannell (2001) were slightly modified for word consistency with the physical activity questions: “I participate or would like to participate in recreation, sport or fitness activity for my own immediate enjoyment or pleasure,” and, “I participate or would like to participate in a recreation, sport or fitness activity because it is good for my health.” The response options ranged from “Not at All” (1) to “Very Much” (5). These two items were combined to form a sum score ($M = 8.24$, $SD = 1.94$).

Constraints. Constraints to leisure-time physical activity were measured using a modified Hubbard and Mannell (2001) Leisure Constraint Scale, omitting items referencing workplace exercise programs and adding items on fear of getting hurt (Alexandris et al., 2003) and poor health (Shaw et al., 1991). There were three types of constraint items: intrapersonal, interpersonal, and structural. Response options were strongly disagree (1) to strongly agree (5). The internal consistency of the 27-item constraints scale was acceptable (coefficient alpha = .78; $M = 2.66$, $SD = .46$), with standardized mean constraints scores calculated for each respondent.

Negotiation. Negotiation strategies were measured using the Hubbard and Mannell (2001) Negotiation Strategies Scale, modified for consistency with the physical activity terminology used in the physical activity questions, and with three workplace items omitted. Negotiation strategies to overcome constraints to leisure-time physical activity participation included the following types of strategies and resources: time management, financial management, skill acquisition, and interpersonal coordination. The response options were modified for consistency with the physical activity response options: never (1), seldom (2), sometimes (3), often (4), and very often (5). A “does not apply” option was also added. “Does

not apply” provided unique information but it was also necessarily and sufficiently “never.” This response option was included to assess whether or not the family negotiation items were applicable to this age demographic. The percentages and variances of the family negotiation items indicated that these items were appropriate for this sample, so they were retained. There was acceptable internal consistency (coefficient alpha = .86) of the modified 33-item negotiation scale ($M = 2.89$, $SD = .49$). Standardized mean negotiation scores were calculated for each respondent.

Leisure-time physical activity. An introductory paragraph about free time recreation, sport or fitness activities and a modified list of physical activities from the Historical Leisure Activity Questionnaire (Kriska et al., 1990) were provided as a reference for answering the leisure-time physical activity questions. The Leisure Time Activity subscale of the Physical Activity Scale for the Elderly (PASE) (NERI: New England Research Institutes, Inc., 1991) was modified to examine respondent’s leisure-time physical activity in the past seven days. The subscale question wording was modified to ask, “Over the past seven days, how often did you participate in [intensity level] *recreation, sport or fitness activities*?” The PASE Leisure Time Activity subscale includes questions about each of four physical activity intensity levels—light, moderate, strenuous, and muscle strength—followed by activity examples. This format was modified to provide parenthetical examples of activities that might be considered a given intensity, with the word “might” chosen purposefully so that activities would yield self-referent intensity categorizations. The four intensity subscale question series include frequency (four-point ordinal scale of the number of days) and duration (four-point ordinal scale of hours) information as well as an open-ended question about the type of activity (e.g., swimming, walking, golfing, etc.). Frequency response options were never (0), seldom (1), sometimes (2),

and often (3). Duration response options were less than one hour (1), 1 but less than 2 hours (2), 2-4 hours (3), and more than 4 hours (4). The open-ended activities question was asked for each intensity level—“What were these (light, moderate, strenuous, or muscle strengthening) recreation, sport or fitness activities?”

In the PASE, walking is listed separately from the intensity questions in the Leisure Time Activity subscale and gardening and yard work are included in the Household Activities subscale. However, based on U.S. government classification of walking and gardening as leisure-time physical activities (CDC, 1997), respondents were allowed to indicate “walking,” “gardening,” and “yard work” in the Leisure Time Activity subscale.

The overall PASE scale has exhibited adequate test-retest reliability ($r = .75$) (Washburn, Smith, Jette, & Janney, 1993) and has been validated with sedentary adults (Washburn, McAuley, Katula, Mihalko, & Boileau, 1999) and older adults with disabilities (Martin et al., 1999). The PASE has also been validated with portable accelerometer monitoring (Washburn & Ficker, 1999).

The PASE scoring protocol was used to compute an overall leisure-time physical activity score. Intensity levels are given activity weights as follows: light (21), moderate (23), strenuous (23), and muscle strength (30). Frequency (days) and duration (hours) information is converted into an hours per day score. A product of the activity weight by the hours per day score results in a weighted sum score for overall leisure-time physical activity across frequency, duration and intensity. An overall score was calculated for each respondent providing complete physical activity information ($M = 30.06$, $SD = 22.47$).

Additionally, to examine the proposed relationships for frequency and duration, sum scores across the four intensity levels were calculated for frequency (0-12; zero indicated no days

in the past week; $M = 3.33$, $SD = 2.31$) and duration (0-16; zero indicated no hours in the past week; $M = 3.51$; $SD = 2.59$).

Due to nonnormal distributions, the overall measure of physical activity and the component measure of duration were transformed using a square root transformation. Subsequent multiple regression model diagnostics on the two transformed dependent variables as well as frequency (untransformed) indicated that the standardized residuals conformed to ordinary least squares assumptions.

Data Analysis

A comparison of sub-sample characteristics was conducted using independent samples t-tests and chi-square tests of significance to determine whether or not the park volunteer and park visitor sub-samples should be analyzed as one sample. The only statistically significant difference between the two samples was age, with the park volunteers being, on average, approximately three years older than the park visitors ($p < .05$). Otherwise, the two samples were similar in terms of gender distribution, SOC, motivation, constraints, negotiation, and physical activity. Therefore, all further analyses were conducted on the full sample.

Amos 5.0/SPSS 13.0 for Windows software was used to perform the correlation and stepwise regression analyses. More specifically, hierarchical regression was used to test the contributions of the interactions and backward stepwise regression was used to omit nonsignificant effects, omitting the least significant interaction from the models first. To test the possible moderating influence of motivation on the SOC-negotiation and SOC-physical activity relationships, Barron and Kenny's (1986) protocol for testing interaction effects was used. An interaction term for SOC and motivation (product of SOC X motivation) was added to their

respective variables in multiple regression equations for the dependent variables—negotiation, overall leisure-time physical activity, frequency and duration. To assess the moderating effect of motivation on the relationship between SOC and duration while controlling for the expected mediating influence of frequency on duration, Barron and Kenny's (1986) recommendation to utilize modeling techniques to test all regression paths simultaneously was followed and Graham, Cumsille, and Elek-Fisk's (2003) procedures for using Amos for regression analysis were used.

Results

Age was not significantly correlated to SOC ($r = -.10, p = .10$), although the relationship was in the expected direction, with older age associated with fewer SOC strategies. Constraints were not significantly correlated to SOC ($r = -.07, p > .20$). SOC and motivation were not significantly correlated ($r = .12, p > .05$) and, therefore, multicollinearity was not considered a likely threat to the interpretation of the interactions.

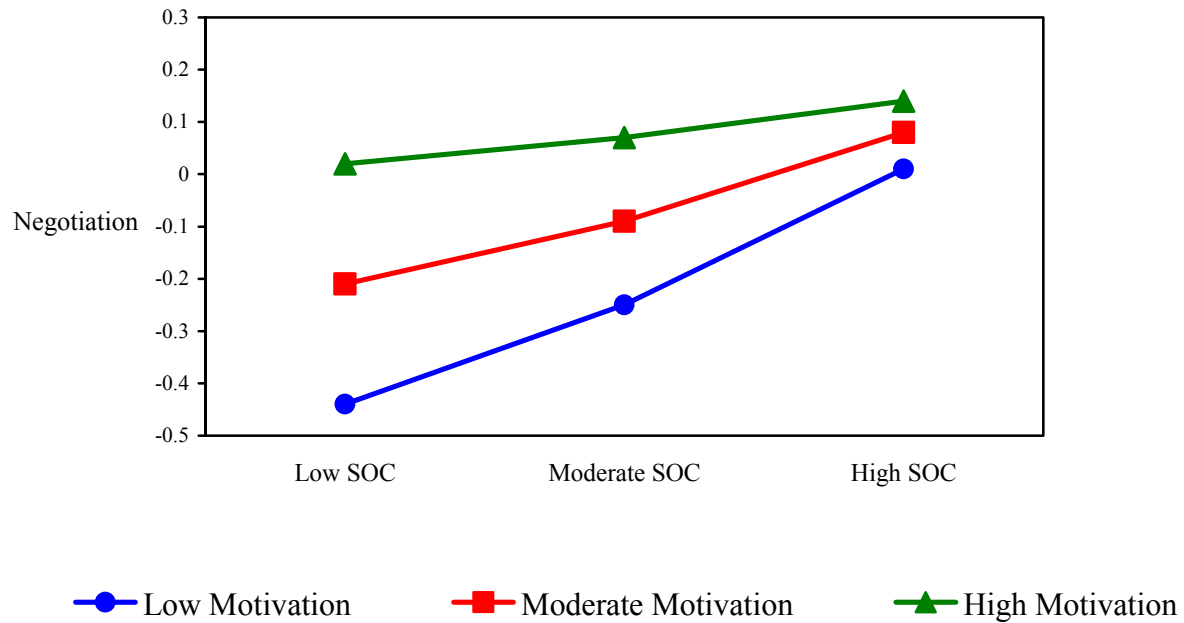
Interactive Effect of SOC and Motivation on Negotiation

The SOC X motivation interaction on negotiation was significant ($\beta = -.56, p < .05$), which added significantly to the explained variance in negotiation strategies ($R^2_{\text{change}} = .01, F = 4.17, p < .05$). These model factors accounted for 17% of the variance in negotiation strategies. Table 4.2 provides the expected negotiation scores for different levels of SOC and motivation, with Figure 4.1 providing a visual depiction of this interactive effect. Across motivation levels, there was a positive relationship between SOC and negotiation. However, this relationship was greatest for people with the lowest levels of motivation.

Table 4.2 Predicted Negotiation Scores Showing the Interactive Effect of SOC and Motivation

<u>SOC</u>	<u>Motivation</u>		
	Low (4)	Moderate (7)	High (10)
Low (.33)	-.44 ¹	-.21	.02
Moderate (.56)	-.25	-.09	.07
High (.89)	.01	.08	.14

¹Standardized mean negotiation scores.

Figure 4.1 Graph of the Interactive Effect of SOC and Motivation on Negotiation Strategies¹

¹Standardized mean negotiation scores.

Interactive Effect of SOC and Motivation on Overall Leisure-Time Physical Activity

There was not a significant SOC X motivation interaction on overall leisure-time physical activity, so it was removed from the model first. Further, SOC was not a significant independent contributor to overall leisure-time physical activity. The saturated and reduced models are shown in Table 4.3. The final reduced model accounted for 21% of the variance in overall leisure-time physical activity. The most significant contributor to overall physical activity was negotiation strategies ($\beta = .24, p < .001$), followed by constraints ($\beta = -.23, p < .001$), motivation ($\beta = .17, p < .01$), age ($\beta = .16, p < .01$) and gender ($\beta = -.13, p < .05$).

Table 4.3 Regression Analysis for the Prediction of Overall Leisure-Time Physical Activity¹

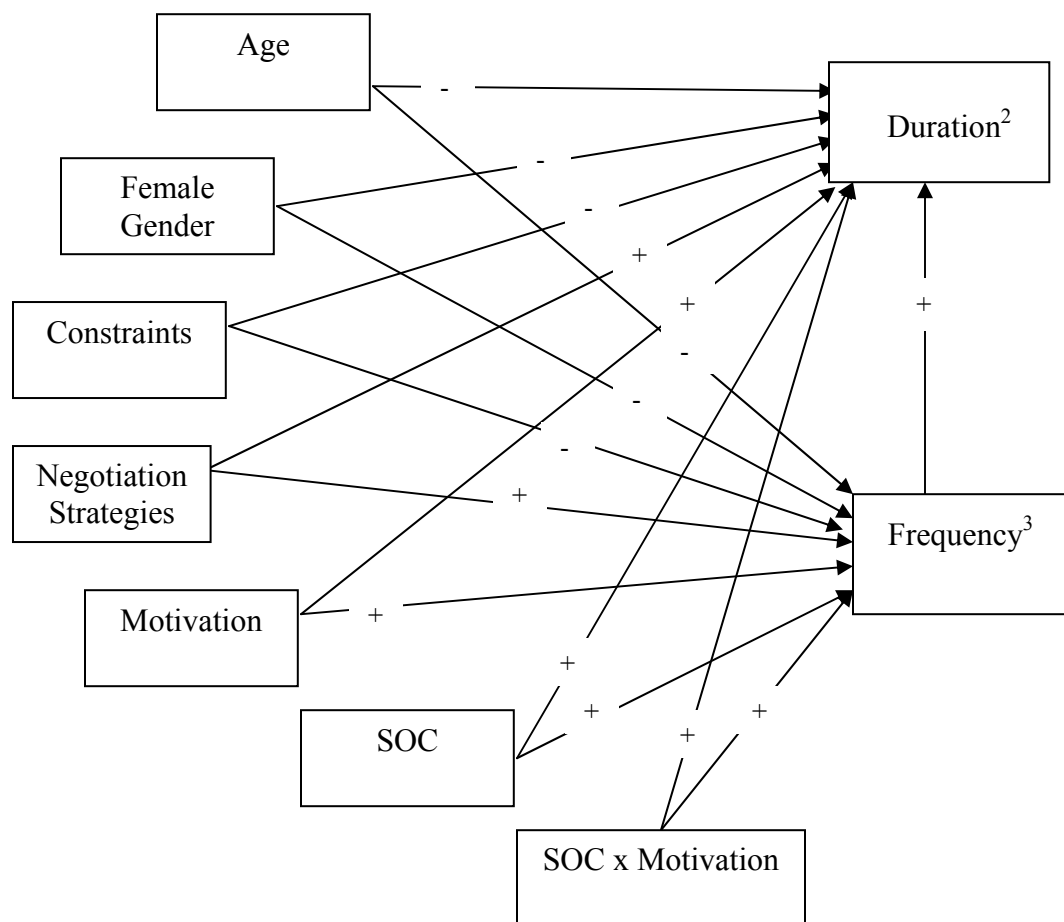
Dimension	<u>Fully Saturated Model</u>				<u>Final Reduced Model</u>			
	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>
Constant	2.50	2.12			.10	1.45		
SOC	-3.91	2.64	-.36	n.s.	--	--	--	--
Motivation	.04	.21	.03	n.s.	.24	.09	.17	.01
Constraints	-1.69	.41	-.24	.001	-1.62	.41	-.23	.001
Negotiation	1.83	.41	.28	.001	1.58	.39	.24	.001
Gender	-.66	.33	-.12	.05	-.74	.33	-.13	.05
Age	.05	.02	.15	.01	.05	.02	.16	.01
SOC x Motivation	.35	.32	.32	n.s.	--	--	--	--
	$R^2 = .22$				$R^2 = .21$			

¹ Square root transformation of weighted sum scores across frequency, duration and intensity of physical activity.

Interactive Effects of SOC and Motivation on Frequency and Duration

Figure 4.2 depicts the hypothesized model of the expected relationships on frequency and duration. The results of the saturated and reduced models are given in Table 4.4. The fully saturated model with the SOC X motivation interaction on frequency and duration indicated that

Figure 4.2 Hypothesized Model of the Interactive Effect of SOC and Motivation on Frequency and Duration of Physical Activity¹



¹ Boxes represent observed variables.

² Square root transformation of duration score across intensity levels.

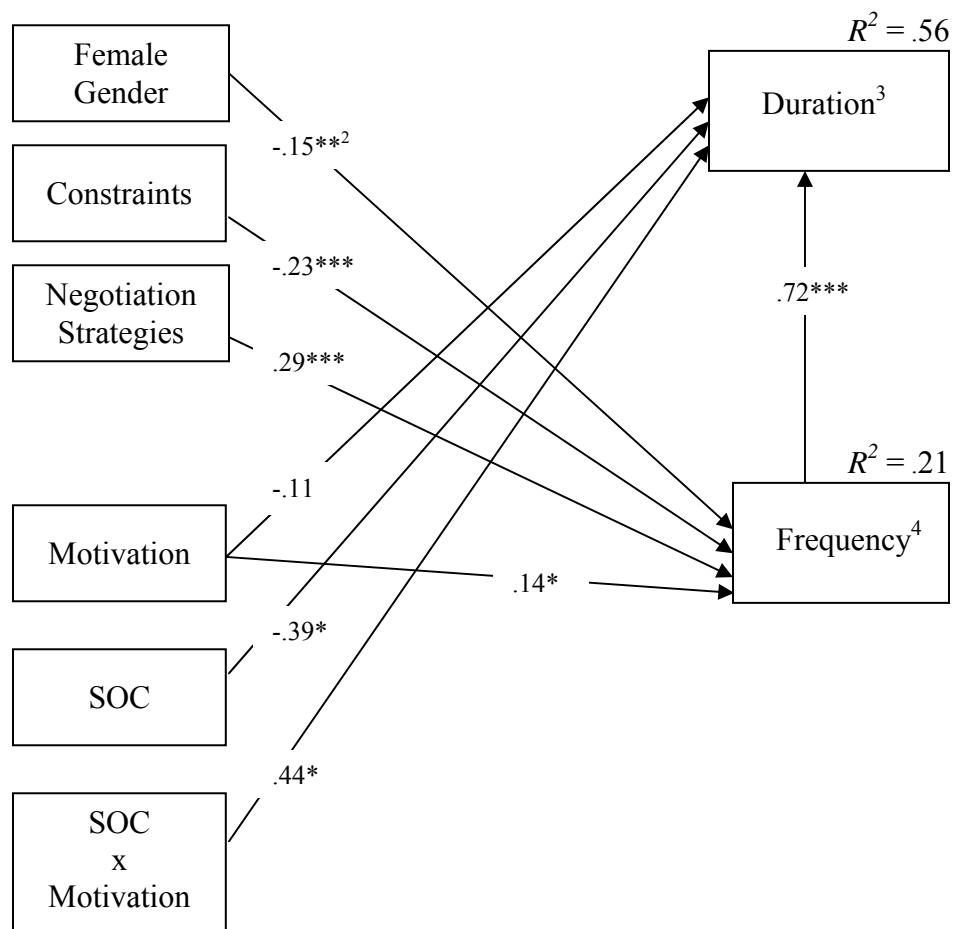
³ Untransformed frequency score across intensity levels.

Table 4.4 Regression Analysis for the Prediction of Frequency and Duration of Physical Activity

Dimension	<u>Fully Saturated Model</u>				<u>Final Reduced Model</u>			
	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>
Frequency								
Constant	3.69	1.70			2.42	.60		
SOC	-3.02	2.11	-.33	n.s.	--	--	--	--
Motivation	.02	.16	.02	n.s.	.17	.07	.14	.05
Constraints	-1.38	.32	-.24	.001	-1.35	.32	-.23	.001
Negotiation	1.79	.33	.33	.001	1.58	.31	.29	.001
Gender	-.62	.26	-.13	.05	-.68	.26	-.15	.01
Age	.01	.01	.02	n.s.	--	--	--	--
SOC x Motivation	.27	.25	.29	n.s.	--	--	--	--
	$R^2=.22$				$R^2=.21$			
Duration								
Constant	1.03	.46			1.26	.34		
SOC	-1.22	.56	-.38	.05	-1.22	.55	-.39	.05
Motivation	-.04	.04	-.10	n.s.	-.05	.04	-.11	n.s.
Constraints	-.09	.09	-.04	n.s.	--	--	--	--
Negotiation	.07	.09	.04	n.s.	--	--	--	--
Gender	-.10	.07	-.06	n.s.	--	--	--	--
Age	.01	.00	.06	n.s.	--	--	--	--
Frequency	.24	.02	.69	.001	.25	.02	.72	.001
SOC x Motivation	.14	.07	.43	.05	.14	.07	.44	.05
	$R^2=.58$				$R^2=.56$			

there was a significant interaction on duration of physical activity in the past week, while controlling for negotiation, constraints, age, gender and frequency. The R^2_{change} of the SOC-motivation interaction on duration was small but statistically significant ($R^2_{\text{change}} = .01$, $F = 4.93$, $p < .05$). The final reduced model, depicted in Figure 4.3, accounted for 21% of the variance in

Figure 4.3 The Interactive Effect of SOC and Motivation on Frequency and Duration: Trimmed Path Model¹



¹ Boxes represent observed variables.

² *** $p < .001$, ** $p < .01$, * $p < .05$

³ Square root transformation of duration score across intensity levels.

⁴ Untransformed frequency score across intensity levels.

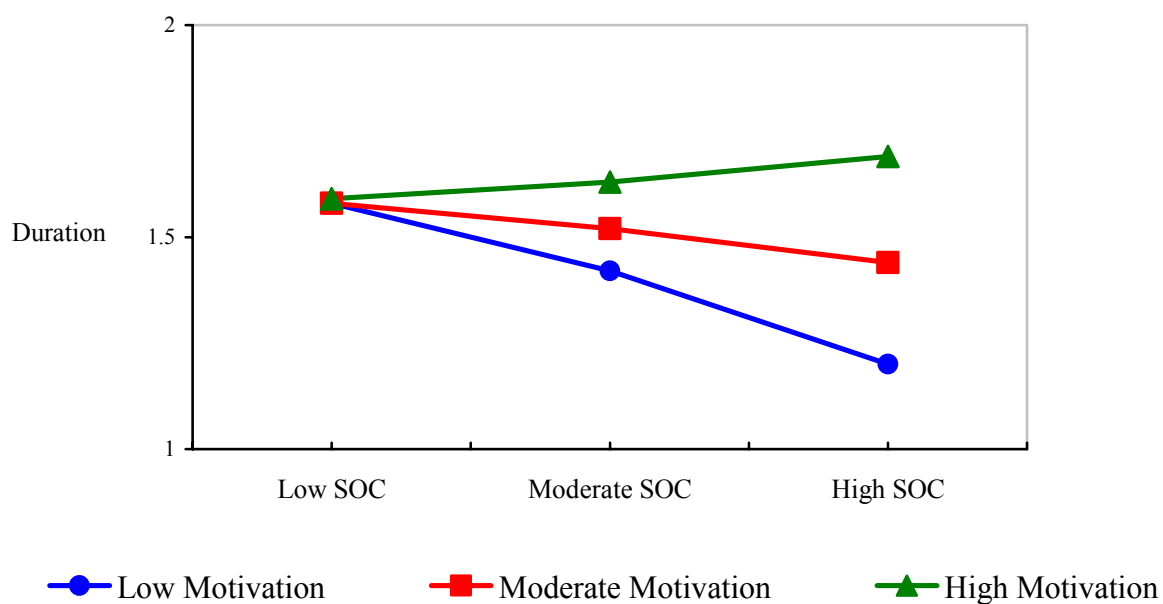
frequency and 56% of the variance in duration. Table 4.5 provides the expected duration scores for different levels of SOC and motivation, with Figure 4.4 providing a visual depiction of this interactive effect. For people with low to moderate levels of motivation, there was a negative

Table 4.5 Predicted Physical Activity Duration Scores Showing the Interactive Effect of SOC and Motivation

<u>SOC</u>	<u>Motivation</u>		
	Low (4)	Moderate (7)	High (10)
Low (.33)	1.58 ¹	1.58	1.59
Moderate (.56)	1.42	1.52	1.63
High (.89)	1.20	1.44	1.69

¹ Square root transformation of duration score across intensity levels.

Figure 4.4 Graph of the Interactive Effect of SOC and Motivation on Physical Activity Duration¹



¹ Square root transformation of duration score across intensity levels.

relationship between SOC and duration, with the largest decline in duration for people with the lowest motivation levels. However, for people with high motivation, there was a positive relationship between SOC and duration.

There was not a significant SOC X motivation interaction for frequency. However, negotiation ($\beta = .29, p < .001$), constraints ($\beta = -.23, p < .001$), gender ($\beta = -.15, p < .01$), and motivation ($\beta = .14, p < .05$) were significant contributors to frequency (see Figure 4.3). There were also significant indirect effects of negotiation ($\beta = .40, p < .0001$), constraints ($\beta = -.34, p < .0001$), gender ($\beta = -.17, p < .05$), and motivation ($\beta = .04, p < .05$) on duration.

Discussion

The purpose of this study was to examine the relationships between selective optimization with compensation (SOC), motivation and negotiation on physical activity in later life. Specifically, the primary objectives of this study were to examine the possible interactive effects of SOC and motivation on negotiation and on multiple measures of leisure-time physical activity (frequency, duration and a composite of these factors with intensity).

This study found support for an interactive effect of SOC and motivation on negotiation strategies, extending previous findings on constraint negotiation (Kay & Jackson, 1991; Shaw et al., 1991) and the relationship between motivation and negotiation (Hubbard & Mannell, 2001). SOC life management strategies were significantly related to the specific negotiation strategies middle-aged and older adults used to overcome constraints to participate in leisure-time physical activity, and this relationship depended on motivation level. For all motivation levels, as SOC levels increased, negotiation levels also increased. Although utilization of negotiation strategies was highest for people with high motivation and lowest for people with low motivation, the

increase in negotiation levels associated with higher SOC levels was largest at the lowest levels of motivation and smallest at the highest levels of motivation. Of particular note was the finding that there was little difference between the negotiation strategy levels of people with high levels of SOC, regardless of motivation levels.

This latter finding seems plausible, particularly when the motivation items used in this study and previous research (Hubbard & Mannell, 2001) are defined more specifically as outcome expectations, which has been shown to be one component of motivation that contributes to physical activity in later life (Shaughnessy, Resnick, & Macko, 2006). More specifically, these findings suggest that utilization of SOC-related general life management strategies influenced domain-specific negotiation strategies to overcome constraints to participation *in spite* of low outcome expectations of the health and enjoyment benefits. It is unclear why the positive relationship between SOC and negotiation would be greatest for people with low outcome expectations. Perhaps general life management strategies have a predisposing influence on the utilization of negotiation strategies. As such, high levels of SOC might influence this utilization almost entirely without regard to expectations of specific benefits. Or, perhaps the value of participation outweighs low expectations, thereby leading to increases in negotiation as SOC increases. Unfortunately, values were not assessed in this study. Future research on the role of SOC, negotiation, and physical activity should measure more dimensions of outcome expectations (Resnick, 2005; Resnick, Zimmerman, Orwig, Furstenberg, & Magaziner, 2000) as well as other motivation types (CAH, 2006; Carroll & Alexandris, 1997) utilizing a general population sample to clarify these relationships. Even so, these findings seem to suggest that general processes of goal formation, prioritization, and implementation to maximize gains and minimize limitations across diverse life domains may have a positive impact on the development

and utilization of specific strategies to participate in physical activity even with little expectation of benefits.

Previous research has suggested that SOC decreases with increased age (Freund & Baltes, 1998; Freund & Baltes, 2002). It appears that an important role for health promotion programs for older adults may be to assess participant's SOC strategies and to identify possible ways to build, or at least maintain, these general life management strategies over time. The finding that SOC and outcome expectations interacted to influence negotiation, which in turn had a positive influence on the three measures of physical activity used in this study, suggests that SOC may impact physical activity distally. However, we still do not know the possible role of SOC on the physical activity participation of people fifty and older in the general population, or for racial and ethnic minorities, or for older adults with chronic health conditions.

Understanding these relationships in diverse populations and contexts would aid in the development of appropriate and efficacious physical activity-based health promotion programs.

Another objective of this study was to test the interactive effect of SOC and outcome expectations on multiple measures of leisure-time physical activity, while controlling for other factors known to influence physical activity. These measures of physical activity included an overall measure of leisure-time physical activity (weighted sum score of frequency, duration and intensity) in addition to its frequency and duration subdimensions. The results document an interaction between SOC and outcome expectations on physical activity duration, suggesting that SOC may have a proximal impact on physical activity, at least on the duration of activity sessions. For people with high outcome expectations, higher levels of SOC were related to higher duration levels. However, for people with low to moderate outcome expectations, the relationship between SOC and duration decreased, with the largest decline in duration for people

with the lowest expectations of benefits. It appears that for people with high expectations regarding the benefits of physical activity, SOC strategies promote longer physical activity sessions. On the other hand, for people with moderate to low expectation levels, SOC strategies are associated with shorter activity sessions. These findings suggest that goal salience may be a deciding factor. More specifically, the decline in duration rates may reflect the presence of a competing, more salient outcome for people with lower expectation levels. It may be the case that people with low expectations who utilize few SOC life management strategies do not have another goal to conflict with participation in physical activity. Therefore, in the absence of a competing goal (e.g., spending time with family or friends), they participate at a similar duration as compared to those with higher outcome expectations. This possibility is supported by the finding that low SOC was associated with similar duration levels across expectation levels. However, for people with low expectations who utilize additional SOC strategies, a more desirable outcome would take precedence over physical activity participation. In effect, the increased levels of SOC-based life management strategies might be directed at an alternative goal that is more valued than leisure-time physical activity. However, in this study respondents were not asked to rank their most important goals, or to indicate the degree to which they value physical activity, so whether or not respondents had another goal in mind is unclear. Identification of alternative goals and their importance should be incorporated into future research on this topic. Even in light of this limitation, the finding that SOC was related to increased duration levels for people with high outcome expectations suggests that finding ways to increase expectations for positive experiences of physical activity may help people to meet *Healthy People 2010* minimum recommended physical activity duration levels (U.S. Department of Health and Human Services, 2000).

This study also supported previous findings of direct relationships between constraints (Alexandris & Carroll, 1997; Alexandris et al., 2003; Hubbard & Mannell, 2001), negotiation (Hubbard & Mannell, 2001), age (Rhodes et al., 1999; Stanley & Freysinger, 1995; Wilcox, Bopp, Oberrecht, Kammermann, & McElmurray, 2003), and gender (Rhodes et al., 1999; Stanley & Freysinger, 1995) on physical activity participation.

In terms of the subdimensions of physical activity, frequency levels in the past week were highly associated with duration of participation in the past week: as the number of days of participation in the past week increased, the number of hours of participation also increased within the same time period. One noteworthy finding was the fact that frequency mediated the relationship of negotiation, constraints, and gender to duration, underscoring the importance of assessing the possible ways that the subdimensions of physical activity are related to each other and other factors known to influence physical activity participation. Another important finding was the fact that constraints and negotiation strategies had countervailing effects on frequency, with constraints decreasing, and negotiation strategies increasing, the number of days of leisure-time physical activity participation. Frequency, in turn, influenced the number of hours spent participating. These findings suggest that physical activity health promotion programs for people over fifty should help participants not only to identify, but also to develop plans to utilize, strategies to overcome constraints to leisure-time physical activity. In effect, programs should include a leisure education component to enhance the probability that participants will attain physical activity goals.

Frequency also explained the relationship of gender to duration level: women had lower frequency levels which, in turn, fully accounted for their lower duration levels. Overall, there is little research on the duration and intensity subdimensions of physical activity as either

explanatory or outcome variables. Studies utilizing physical activity subdimensions as explanatory variables underscore the importance of examining the multidimensionality of physical activity. For example, Green and Crouse (1995) conducted a meta-analysis and found that duration of physical activity was one factor that significantly increased functional capacity in older adults, even when controlling for frequency. On the other hand, Lee, Sesso, and Paffenbarger (2000) found that duration no longer predicted lower coronary heart disease risk once total energy expended (intensity) and other confounders were controlled. The present investigation utilized frequency and duration, and a combination of these factors with intensity, as outcome variables but it may also be useful to examine the role of these subdimensions on other factors, such as physical and mental health outcomes.

Conclusion

The purpose of this cross-sectional study was to examine the relationships between selective optimization with compensation (SOC), motivation, negotiation, and physical activity in later life. The results indicated that SOC and outcome expectations interact to influence negotiation and physical activity duration. Across expectation levels, general SOC-based life management strategies had a positive influence on specific negotiation strategies to overcome constraints to physical activity, with the largest gains made by the group with the lowest outcome expectations. And, for those with high outcome expectations, SOC also positively influenced duration levels. These findings have implications for physical activity programs for people fifty and older: incorporating a leisure education component aimed at increasing SOC-based life management strategies, outcome expectations, and specific negotiation strategies to overcome constraints may positively influence leisure-time physical activity in this population. However,

further research is needed with a representative sample of people 50 and older to establish whether these findings were due to the unique characteristics of the middle-aged and older adults in this sample or, alternatively, whether these results may apply to the general population also.

This study expands previous research on the constraint negotiation of leisure-time physical activity to include the influence of SOC on leisure-time physical activity and provides support for its continued study. The findings also point to the importance of examining multiple dimensions of physical activity. Although the focus of the current study was on independent-living middle-aged and older adults, these findings have implications for people with disabilities, racial and ethnic minorities, and caregivers. These findings also have implications for behavior change physical activity programs and for understanding initiation, adherence, and maintenance of physical activity in later life.

References

- Addy, C. L., Wilson, D. K., Kirtland, K. A., Ainsworth, B. E., Sharpe, P., & Kimsey, D. (2004). Associations of perceived social and physical environmental supports with physical activity and walking behavior. *American Journal of Public Health, 94*, 440-443.
- Alexandris, K., & Carroll, B. (1997). An analysis of leisure constraints based on different recreational sport participation levels: Results from a study in Greece. *Leisure Sciences, 19*, 1-15.
- Alexandris, K., Tsorbatzoudis, C., & Grouios, G. (2002). Perceived constraints on recreational sport participation: Investigating their relationship with intrinsic motivation, extrinsic motivation and Amotivation. *Journal of Leisure Research, 34*, 233-252.
- Alexandris, K., Barkoukis, V., Tsorbatzoudis, H., & Groulos, G. (2003). A study of perceived constraints on a community based physical activity program for the elderly in Greece. *Journal of Aging and Physical Activity, 11*, 305-318.
- Baltes, M. M, & Carstensen, L. L. (1996). The process of successful ageing. *Ageing and Society, 16*, 397-422.
- Baltes, M. M, & Carstensen, L. L. (1999). Social-psychological theories and their applications to aging: From individual to collective. V. L. Bengtson & K. W. Schaie (Eds.), *Handbook of theories of aging* (pp. 209-226). New York: Springer.
- Baltes, M. M, & Carstensen, L. L. (2003). The process of successful aging: Selection, optimization, and compensation. In U. M. Staudinger & U. Linderberger (Eds.), *Understanding human development: Dialogues with lifespan psychology* (pp. 81-104). New York: Kluwer.
- Baltes, P. B., & Baltes, M. M. (1990). Psychological perspectives on successful aging: The

- model of selective optimization with compensation. In P. B. Baltes & M. M. Baltes (Eds.), *Successful aging: Perspectives from the behavioral sciences* (pp. 1-34). New York: Cambridge University Press.
- Baltes, P. B., Baltes, M. M., Freund, A. M., & Lang, F. R. (1995). *Measurement of selective optimization with compensation by questionnaire*. Berlin: Max Planck Institute for Human Development.
- Barron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, **51**, 1173-1182.
- Carroll, B., & Alexandris, K. (1997). Perception of constraints and strength of motivation: Their relationship to recreational sport participation in Greece. *Journal of Leisure Research*, **29**, 279-299.
- CDC. (1997). Monthly estimates of leisure-time physical inactivity—United States, 1994. Retrieved April 3, 2006, from <http://www.cdc.gov/mmwr/preview/mmwrhtml/00047596.htm>
- CDC. (2000). Behavioral Risk Factor Surveillance System (BRFSS). Retrieved March 22, 2005, from <http://www.cdc.gov/nccdphp/dnpa/physical/stats/tainacage.htm>
- Center for the Advancement of Health. (CAH). (2006). A new vision of aging: Helping older adults make healthier choices. Retrieved March 9, 2006, from <http://www.cfah.org/pdfs/agingreport.pdf>
- Chandler, J. M., & Hadley, E. C. (1996). Exercise to improve physiologic and functional performance in old age. *Clinics in Geriatric Medicine*, **12**, 761-784.
- Courneya, K. S., & McAuley, E. (1994). Are there different determinants of the frequency, intensity, and duration of physical activity? *Behavioral Medicine*, **20**, 84-90.

- Crawford, D. W., & Godbey, G. C. (1987). Reconceptualizing barriers to family leisure. *Leisure Sciences*, **9**, 119-127.
- Crawford, D., Jackson, E., & Godbey, G. (1991). A hierarchical model of leisure constraints. *Leisure Sciences*, **13**, 309-320.
- Dishman, R. (2001). The problem of exercise adherence: Fighting sloth in nations with market economies. *Quest*, **53**, 279-294.
- Farbrigoule, C., Letenneur, L., & Dartigues, J.F. (1995). Social and leisure activities and risk of dementia: A prospective longitudinal study. *Journal of the American Geriatric Society*, **43**, 485-490.
- Freund, A. M., & Baltes, P. B. (1998). Selection, optimization, and compensation as strategies of life management: Correlations with subjective indicators of successful aging. *Psychology and Aging*, **13**, 531-543.
- Freund, A. M., & Baltes, P. B. (2002). Life-management strategies of selection, optimization, and compensation: Measurement by self-report and construct validity. *Journal of Personality and Social Psychology*, **82**, 642-662.
- Freund, A. M., Li, K. Z. H., & Baltes, P. B. (1999). Successful development and aging: The role of selection, optimization, and compensation. In J. Brandtstädter & R. M. Lerner (Eds.), *Action and self-development: Theory and research through the life span* (pp. 401-434). Thousand Oaks, CA: Sage.
- Graham, J., W., Cumsille, P. E., & Elek-Fisk, E. (2003). Methods for handling missing data. In J.A. Schinka & W. F. Velicer (Eds.), *Research methods in psychology* (pp. 87-114). Volume 2 of the *Handbook of psychology* (I. B. Weiner, Editor-in-Chief). New York: John Wiley & Sons.

- Green, J. S., & Crouse, S. F. (1995). The effects of endurance training on functional capacity in the elderly: A meta-analysis. *Medicine and Science in Sports and Exercise*, **27**, 920-926.
- Hubbard, J., & Mannell, R. (2001). Testing competing models of the leisure constraint and negotiation process in a corporate employee recreation setting. *Leisure Sciences*, **23**, 145-163.
- Iso-Ahola, S. E. (1999). Motivational foundations of leisure. In E. L. Jackson & T. L. Burton (Eds.), *Leisure studies: Prospects of the twenty-first century* (pp. 35-51). State College, PA: Venture.
- Jackson, E. L., Crawford, D. W., & Godbey, G. (1993). Negotiation of leisure constraints. *Leisure Sciences*, **15**, 1-11.
- Janke, M. C., & Davey, A. (2004). Selective optimization with compensation in the leisure patterns of older adults. *Gerontologist*, **44**, 321.
- Kay, T., & Jackson, E. (1991). Leisure despite constraint: The impact of leisure constraints on leisure participation. *Journal of Leisure Research*, **23**, 301-313.
- King, A. C., Castro, C., Wilcox, S., Eyler, A. A., Sallis, J. F., & Brownson, R. C. (2000). Personal and environmental factors associated with physical inactivity among different racial-ethnic groups of U.S. middle-aged and older-aged women. *Health Psychology*, **19**, 354-364.
- Kriska, A. M., Knowler, W. C., LaPorte, R. E., Drash, A. L., Wing, R. R., Blair, S. N., et al. (1990). Development of a questionnaire to examine the relationship of physical activity and diabetes in Pima Indians. *Diabetes Care*, **13**, 401-411.
- Lang, F. R., Rieckmann, N., & Baltes, M. M. (2002). Adapting to aging losses: Do resources

facilitate strategies of selection, compensation, and optimization in everyday functioning?

Journal of Gerontology: Psychological Sciences, **57**, P501-509.

Lee, I. M., Paffenbarger, R. S., & Hennekens, C. H. (1997). Physical activity, physical fitness and longevity. *Aging*, **9**, 2-11.

Lee, I. M., Sesso, H. D., & Paffenbarger, R. S. (2000). Physical activity and coronary heart disease risk in men: Does the duration of exercise episodes predict risk? *Circulation*, **102**, 981-986.

Lees, F. D., Clark, P. G., Nigg, C. R., & Newman, P. (2005). Barriers to exercise behavior among older adults: A focus group study. *Journal of Aging and Physical Activity*, **13**, 23-33.

Mannell, R. C., & Kleiber, D. A. (1997). *Social psychology of leisure*. State College, PA: Venture.

Mannell, R. C., & Loucks-Atkinson, A. (2005). Why don't people do what's "good" for them? Cross-fertilization among the psychologies of nonparticipation in leisure, health, and exercise behaviors. In E. L. Jackson (Ed.), *Constraints to leisure*, (pp. 221-232). State College, PA: Venture.

Mannell, R. C., & Zuzanek, J. (1991). The nature and variability of leisure constraints in daily life: The case of the physically active leisure of older adults. *Leisure Sciences*, **13**, 337-351.

Martin, K. A., Rejeski, W. J., Miller, M. E., James, M. K., Ettinger, Jr., W. H., & Messier, S. P. (1999). Validation of the PASE in older adults with knee pain and physical disability. *Medicine & Science in Sports & Exercise*, **31**, 627-633.

Morgan, K., & Bath, P. A. (1998). Customary physical activity and psychological wellbeing: A

- longitudinal study. *Age and Ageing*, **27**, 35-40.
- National Blueprint (2002). Retrieved March 10, 2006, from <http://www.agingblueprint.org/StrategicPriorities.cfm>
- New England Research Institutes, Inc. (NERI). (1991). PASE: Physical Activity Scale for the Elderly. Watertown, MA: NERI.
- Oguma, Y., Sesso, H.D., Paffenbarger, R.S., & Lee, I.M. (2001). Physical activity and all cause mortality in women: A review of the evidence. *British Journal of Sports Medicine*, **36**, 162-172.
- Oh, S. S. (2005). *Older adults' selective optimization with compensation in the context of gardening*. Unpublished doctoral dissertation, The Pennsylvania State University, State College.
- Patterson, I., & Chang, M. L. (1999). Participation in physical activity by older Australians: A review of the social psychological benefits and constraints. *Australian Journal on Ageing*, **18**, 179-185.
- Raymore, L., Godbey, G., Crawford, D., & von Eye, A. (1993). Nature and process of leisure constraints: An empirical test. *Leisure Sciences*, **15**, 99-113.
- Resnick, B. (2005). Reliability and validity of the Outcome Expectations for Exercise Scale-2. *Journal of Aging and Physical Activity*, **13**, 382-394.
- Resnick, B., Zimmerman, S. I., Orwig, D., Furstenberg, A. L., & Magaziner, J. (2000). Outcome expectations for exercise scale: Utility and psychometrics. *Journal of Gerontology*, **55**, S352-356.
- Rhodes, R. E., Martin, A. D., Taunton, J. E., Rhodes, E. C., Donnelly, M., & Elliott, J. (1999). Factors associated with exercise adherence among older adults: An individual

- perspective. *Sports Medicine*, **28**, 397-411.
- Ryan, E. B., Anas, A. P., Beamer, M., & Bajorek, S. (2003). Coping with age-related vision loss in everyday reading activities. *Educational Gerontology*, **29**, 37-54.
- Sallis, J. F., & Hovell, M. F. (1990). Determinants of exercise behavior. In J.O. Holloszy, & K. B. Pandolf (Eds.), *Exercise and sport sciences reviews* (pp. 307-330). Baltimore, MD: Williams & Wilkins.
- Shaughnessy, M., Resnick, B. M., & Macko, R. F. (2006). Testing a model of post-stroke exercise behavior. *Rehabilitation Nursing*, **31**, 15-21.
- Shaw, S. M., Bonen, A., & McCabe, J. (1991). Do more constraints mean less leisure? Examining the relationship between constraints and participation. *Journal of Leisure Research*, **23**, 286-300.
- Shephard, R. J. (1997). *Aging, physical activity, and health*. Champaign, IL: Human Kinetics.
- Stanley, D., & Freysinger, V. J. (1995). The impact of age, health, and sex on the frequency of older adults' leisure activity participation: A longitudinal study. *Activities, Adaptation and Aging*, **19**, 31-42.
- U.S. Department of Health and Human Services. (1996). *Physical activity and health: A report of the Surgeon General*. Atlanta, Georgia: US Department of Health and Human Services, Public Health Service, CDC, National Center for Chronic Disease Prevention and Health Promotion.
- U.S. Department of Health and Human Services. (2000). *Healthy people 2010: Understanding and improving health*. Washington, DC: US Department of Health and Human Services.
- Washburn, R. A., & Ficker, J. L. (1999). Physical Activity Scale for the Elderly (PASE): The

- relationship with activity measured by portable accelerometer. *Journal of Sports Medicine and Physical Fitness*, **39**, 336-340.
- Washburn, R. A., McAuley, E. Katula, J., Mihalko, S. L., & Boileau, R. A. (1999). The Physical Activity Scale for the Elderly (PASE): Evidence for validity. *Journal of Clinical Epidemiology*, **52**, 643-651.
- Washburn, R. A., Smith, K. W., Jette, A. M., & Janney, C. A. (1993). The physical activity scale for the elderly (PASE): Development and evaluation. *Journal of Clinical Epidemiology*, **15**, 3-162.
- Weuve, J., Kang, J., Manson, J., Breteler, M., Ware, J., & Grodstein, F. (2004). Physical activity, including walking, and cognitive function in older women. *JAMA*, **292**, 1454-1461.
- Wilcox, S., & Storandt, M. (1996). Relations among age, exercise, and psychological variables in a community sample of women. *Health Psychology*, **15**, 110-113.
- Wilcox, S, Bopp, M, Oberrecht, L., Kammermann, S. K., & McElmurray, C. T. (2003). Psychosocial and perceived environmental correlates of physical activity in rural and older African American and white women. *Journals of Gerontology*, **58**, P329-P337.
- Wilcox, S., Castro, C., King, A. C., Housemann, R., & Brownson, R. C. (2000). Determinants of leisure time physical activity in rural compared with urban older and ethnically diverse women in the United States. *Journal of Epidemiology and Community Health*, **54**, 667-672.
- Zlot, A. I., Librett, J. J., Buchner, D. M., & Schmid, T. L. (2006). Environmental, transportation, social, and time barriers to physical activity. *Journal of Physical Activity and Health*, **3**, 15-21.

CHAPTER 5

SUMMARY AND CONCLUSIONS

The overarching aim of this study was to incorporate age, gender, SOC, and multiple measures of physically active leisure into the study of the leisure constraint negotiation process. This chapter is intended to summarize the findings and implications discussed in the preceding chapters as well as to highlight future research directions on this topic.

Summary of Key Findings

This study attempted to address nine research questions and seven hypotheses related to the constraint negotiation process. As articulated in the Orientation to Chapter 4, the ninth research question was not examined. Instead, ideas about the future investigation of this question will be addressed later in this chapter.

Following are the summaries of the research questions and hypotheses investigated in this study:

RQ1. Is SOC positively related to physical activity participation?

SOC was positively related to duration of physical activity, but only for people with high motivation. For people with low to moderate motivation, the relationship between SOC and duration was negative and this decline was greatest for people with low motivation. SOC was

not directly related to overall levels of physically active leisure (weighted sum score of frequency, duration and intensity) or the frequency subdimension.

RQ2. Is motivation positively related to physical activity participation?

In the structural equation model of overall participation that included age and gender, motivation was positively related to overall physically active leisure. When age and gender were not included in the analysis, this direct effect disappeared.

In the regression analysis of the interactive effects of SOC and motivation on frequency and duration, there was a positive main effect of motivation on frequency and an interactive effect on duration; in the latter case, motivation was positively associated with duration, particularly for people with high SOC. However, in the structural equation model of constraint, negotiation, motivation, age and gender on frequency and duration, motivation was not directly related to frequency or duration. Because the reduced regression model for frequency omitted SOC, such that these models were equivalent aside from the statistical analyses used to examine them, these findings together indicate that there is not a direct relationship between motivation and frequency when controlling for measurement error.

RQ3. Is age positively related to constraints?

Age was not significantly related to constraints, and the correlation was negative. Older age was not associated with higher levels of perceived constraints.

RQ4. When controlling for age and gender, do constraints influence SOC?

In structural equation models, age and gender did not significantly influence constraints and in correlation analysis age did not significantly influence SOC. Therefore, controlling for these factors in the examination of this research question was not necessary. The correlation analysis indicated that constraints did not significantly influence SOC.

RQ5. Is there an interaction between negotiation and constraints on physical activity participation?

The results of the regression analysis indicated that there was not a significant interaction between negotiation and constraints on overall physically active leisure. Therefore, negotiation as a “buffer” of the negative impact of constraints on participation was not supported in this study.

RQ6. Is there an interaction between motivation and constraints on physical activity participation?

The results of the regression analysis indicated that there was not a significant interaction between motivation and constraints on overall physically active leisure. Therefore, the “balance” proposition that higher levels of motivation will reduce the impact of constraints on participation was not supported in this study.

RQ7. When controlling for age, is there an interaction between SOC and motivation on negotiation strategies?

The regression analysis results indicated that there was a significant interaction between SOC and motivation on negotiation strategies. Although there was a positive relationship between SOC and negotiation across motivation levels, this relationship was strongest for people with the lowest motivation levels.

RQ8. When controlling for age, is there an interaction between SOC and motivation on physical activity participation?

The regression analysis results indicated that there was a significant interaction between SOC and motivation for duration of physical activity. There was a positive relationship between SOC and duration for people with high motivation whereas there was a negative relationship between SOC and duration for people with low to moderate motivation.

H1. Age will be negatively related to SOC.

In correlation analysis, age was negatively associated with SOC but this association was not significant.

H2. Age will be negatively related to physical activity participation.

In both the regression and the structural equation analyses, age was positively—not negatively—related to overall physically active leisure participation. However, in the regression and structural equation analyses, age was not significantly related to frequency or duration of physical activity.

H3. Female gender will be negatively related to physical activity participation.

In regression and structural equation analyses, female gender was negatively related to all types of participation—overall physically active leisure and its frequency and duration subdimensions. The results also indicated that frequency fully mediated the negative relationship between gender and duration.

H4. Female gender will be positively related to constraints.

In structural equation models, female gender was not significantly related to constraints.

H5. People with higher levels of constraint will have lower physical activity participation.

In the regression and structural equation analyses, higher levels of constraints were associated with lower levels of physically active leisure participation across types (overall, frequency and duration). The results also indicated that frequency fully mediated the negative relationship between constraints and duration.

H6. People with higher levels of constraint will have greater use of negotiation strategies.

The results of the structural equation analyses indicated that higher levels of constraints were not associated with higher levels of negotiation, when controlling for age and gender and for all of the measures used (overall, frequency, and duration).

H7. Motivation will have an indirect, positive relationship with physical activity through negotiation strategies.

Using structural equation modeling, motivation had significant indirect relationships, through negotiation strategies, to overall physically active leisure and its frequency subdimension. Controlling for age and gender, negotiation partially mediated the relationship between motivation and overall participation and fully mediated the relationship between motivation and frequency. The prerequisite relationships between negotiation and participation were also supported: negotiation had significant positive relationships to overall participation

and frequency. The results also indicated that frequency fully mediated the relationship between negotiation and duration.

Implications

1. The significant relationships of constraints and negotiation to all of the physical activity measures across the three studies, and in accord with previous research with a younger age demographic of adults (Hubbard and Mannell, 2001), indicate that these factors are important aspects of physically active leisure in later life. These findings also suggest that constraints and negotiation deserve continued consideration with other age-distinct samples and with other leisure behaviors to verify their generalizability and relative importance.
2. The positive relationship between negotiation and physical activity in this study and in Hubbard and Mannell's (2001) study suggests that leisure-based physical activity programs should incorporate educational sessions that identify useful strategies to overcome constraints to physical activity and that provide guidance on the implementation of such strategies. One-on-one or group-based leisure education and counseling sessions could serve in this capacity.
3. The positive relationship between expectations about the health and enjoyment benefits of physical activity (i.e., motivation) and negotiation strategies to overcome constraints to participation suggests that finding ways to increase such positive expectations might be a

key factor in increasing levels of physically active leisure for people 50 and older. The finding of a direct relationship between expectations and overall physically active leisure in study two (Chapter 3) supports this conclusion. One implication of these findings is that leisure-based physical activity programs should consider incorporating a leisure education component that focuses attention on the benefits of physical activity.

4. The positive relationship between SOC and negotiation across expectation levels suggests that general life management strategies are related to the utilization of specific strategies to overcome constraints to physical activity participation even in spite of low expectations regarding the benefits of participation. This finding suggests that general processes of goal formation, prioritization, and implementation to maximize gains and minimize losses across diverse life domains can have a positive impact on physical activity by way of bolstering the use of negotiation strategies.
5. The positive relationship between SOC and physical activity duration for people with high expectations regarding the benefits of participation suggests that SOC has a direct influence on this component of physical activity if expectations are high. This finding indicates, therefore, that it is important to identify ways to increase expectations for positive experiences of physical activity to increase the likelihood that people meet minimum recommended physical activity duration levels.
6. The significant findings pertaining to SOC suggest that SOC is an important factor to consider in the constraint negotiation process. These findings suggest that it would be

worthwhile to attempt to translate this goal-directed theory of successful aging into practice. For example, it may be possible to provide leisure education to help older adults to identify general life management strategies of goal selection, outcome optimization, and compensation to continue to participate in health promoting activities, such as physically active leisure, even in the face of increasing health-related constraints. Or, SOC-based strategy building could be part of an intervention program to increase the physical activity of older adults at risk for falls, for example.

7. The findings across studies indicate that different models are relevant depending on what measure of physical activity is used (frequency, duration, or an overall score across frequency, duration and intensity). Therefore, obtaining multiple measurements of physical activity is important in understanding these relationships. For instance, to answer the question as to whether or not there is a good fitting model of the relationships between SOC, constraints, negotiation, motivation, age, gender, and physical activity participation (RQ9), the findings of this study suggest that it would be necessary to propose different models for overall physically active leisure and for frequency and duration.

Future Research Directions

There are several recommendations for future research on the topic of constraint negotiation. One important task for future research is to examine the constraint negotiation process for diverse populations, in contrast to the mostly active, middle-class, Caucasian samples typically used. It is important to determine whether the patterns of relationships between

constraints, negotiation, motivation, and participation are the same or different for racially and ethnically diverse groups, for people with disabilities, for the poor, for urban and rural residents, and for children and adolescents. It is important to examine these relationships for nonparticipants as well. Determining the generalizability of these relationships in both general population and special population samples is an important endeavor for future research.

A related area for future research would be testing the reliability and validity of the measurements of constraints, negotiation, SOC, and leisure-time physical activity. In particular, the negotiation scale has not been validated with a representative sample of adults aged 18 and older and, therefore, one issue that remains unclear is whether or not constraint negotiation differs by age. For instance, do young adults utilize higher or lower levels of negotiation strategies than older adults? Another measurement issue is whether or not leisure-time physical activity should include activities that appear to be both instrumental and expressive, such as yard work, when people indicate that these activities are free time activities done away from work and volunteering and are thus categorized as “leisure.” Further, if one aim of research on physical activity is to try to understand its multidimensionality, it may be important to develop scales with a higher level of specificity and complexity in relation to the subcomponents of physical activity—frequency, duration and intensity. Toward this aim, the PASE measures of frequency and duration might be revised to provide ratio level data rather than ordinal level data. Whether to provide a definition of “light,” “moderate,” and “strenuous” physical activities, or to allow these levels to be self-referent, remains an issue as well. In this study, the respondents of the pilot test agreed that they did not think that the intensity definitions were needed and, if anything, that they might even prove confusing. However, several of the respondents who participated in the study indicated that they would have liked to have the intensity level definitions to help them

to better answer the questions on leisure-time physical activity. An additional measurement issue concerns SOC. Several of the respondents in this study indicated that they did not understand how to answer the SOC items. Perhaps this situation arose because the SOC scale was the only measure used in this study that did not specifically reference physical activity. Or, perhaps the wording of the SOC scale was difficult to follow. Or, perhaps because many of the respondents of this study appeared to be in good health and indicated high levels of perceived physical health, the SOC items pertaining to loss-based selection and compensation simply did not apply to them. This latter possibility was raised during the pilot test, which prompted a revision of the instructions to give respondents the option to skip not applicable SOC items. Even so, because the SOC scale was the only major respondent complaint about the questionnaire, it appears that there is a need to improve this scale for use in future leisure research. There is also a need to test the validity and reliability of the SOC scale with other leisure-based activities in addition to leisure-time physical activity.

Given the significant preliminary findings pertaining to SOC in this study, future research should continue to examine the role of SOC in models of the constraint negotiation process. These findings suggest that different models would be needed for different measures of physical activity. Although further research is needed to determine the suitability of SOC in factor analytic models of the constraint negotiation process, the results of this study also suggest that it may be worthwhile to examine multi-group models of SOC, age, gender, constraints, negotiation and the physical activity measures by motivation level (RQ9). More specifically, the study findings indicate that a multi-group model of the duration of an activity session should posit a direct relationship between SOC and duration whereas the multi-group model for overall

physical activity (a composite with all three subdimensions) should posit an indirect relationship through negotiation.

Future research on the constraint negotiation process should also investigate the possible relationships between the sub-domains of constraints, negotiation and SOC as opposed to examining overall levels only. The unexplained commonalities between interpersonal constraint and interpersonal negotiation and between structural constraint and financial strategies support the conclusion that there is a need for closer examination of the constraints and negotiation sub-domains. Additionally, it seems plausible that the sub-domains of SOC might have different effects on time, financial, skill acquisition and interpersonal negotiation strategies. For example, the selection of swimming as a physical activity might prompt the utilization of different negotiation strategies than walking. Understanding the nature and the complexity of these relationships would help to inform leisure-based physical activity programs that incorporate a leisure education component to enhance physical activity adherence and/or maintenance.

An important task for future research on constraint negotiation will be the incorporation of additional constructs that appear related to the constraint negotiation process. For example, in this study and in previous research (Hubbard & Mannell, 2001) only one aspect of motivation was examined—outcome expectations. Future research should also consider other aspects of motivation (e.g., achievement motivation) in the constraint negotiation process to see whether or not they are related to negotiation. The results of this study also indicated that it is important to account for the effects of age and gender when examining the constraint negotiation process; future research should therefore consider the influence of these respondent characteristics. Other sociodemographic factors, such as marital status and work status, may also influence the constraint negotiation process. More specifically, motivation to participate in physical activity in

later life may vary depending on whether or not people are working full-time, are married, and/or have children living in the home. For instance, older women may vary their physical activity participation depending on their husband's interests, or vice versa. Research on older couples might help to illuminate these nuances. Social networks may play a role in the constraint negotiation process of physical activity participation as well. In this regard, researchers might consider the possible linkages between social networks, constraint negotiation, SOC, age and gender. Additionally, there is a need to examine other leisure behaviors and experiences (Hubbard & Mannell, 2001; Jackson, 2000) to determine the generalizability of constraint negotiation across leisure domains. Taken altogether, it appears that there is room for more complex investigations of the constraint negotiation process.

Another recommended area for future research would be the examination of the constraint negotiation process during major life transitions (see Jackson, 2005, for a thorough treatment of this topic), such as during the transition to retirement, after the onset of a chronic illness, or after the death of a loved one. Although researchers often presume that constraint negotiation is a process, there is actually a dearth of longitudinal research to evidence it. Hence, there is a need for research that investigates the ways in which negotiation may change over time and depending on life circumstances. For example, taking a life course perspective (Moen, 2001), it might be helpful to conduct a qualitative study to examine the possible differences between men and women in the constraint negotiation process for physically active leisure during retirement or after the onset of a chronic illness or disability. Given the findings of this study, such research also should consider including questions pertaining to the process of selection, optimization and compensation of physical activity.

Last, but certainly not least, there is a need for translational research on the constraint negotiation of physically active leisure. For example, researchers might investigate the motivation, negotiation and physical activity of people before, during and after a leisure-based physical activity program to see how these levels may fluctuate over time. Or, researchers could evaluate the efficacy of intervention programs that incorporate a leisure education component on one or more of the following: the benefits of physical activity, the identification and utilization of negotiation strategies, or the development of SOC-based life management strategies. For example, a research project with sedentary older adults might have the following components: one group receives a leisure-based physical activity program with a leisure education component (experimental group 1), another group receives just the physical activity program (experimental group 2), and yet another group receives just the leisure education component (control group) (all participants are randomly assigned to groups). Then, comparisons on physical activity levels could be made between groups during the program and one month post-program. This example is just one of the many possibilities for translational research to test the real-world applicability of outcome expectations, constraint negotiation and SOC to physically active leisure.

References

- Hubbard, J., & Mannell, R. (2001). Testing competing models of the leisure constraint and negotiation process in a corporate employee recreation setting. *Leisure Sciences, 23*, 145-163.
- Jackson, E. L. (2000). Will research on leisure constraints still be relevant in the twenty-first century? *Journal of Leisure Research, 32*(1), 62-68.
- Jackson, E. L. (2005). Impacts of life transitions on leisure and constraints to leisure. In E.L. Jackson (Ed.), *Constraints to leisure*, (pp. 115-136). State College, PA: Venture.
- Moen, P. (2001). The gendered life course. In R. H. Binstock & L. K. George (Eds.), *Handbook of aging and the social sciences* (5th ed.) (pp. 179-196). New York: Academic Press.

APPENDIX

QUESTIONNAIRE

**SELECTION, OPTIMIZATION, AND COMPENSATION
IN LEISURE TIME PHYSICAL ACTIVITY**

<p>Section One: Your Health</p>
--

Please respond to Questions 1 through 3 by checking the answer that best reflects how you feel about your health.

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

- Excellent
 Very good
 Good
 Fair
 Poor

2. Do you sometimes feel that you can't enjoy certain activities because of your health?

- No (Go to #3)
 Yes



2a. What are these activities? <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/>

3. How TRUE or FALSE is *each* of the following statements for you? (Circle one number for each.)

	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
a. I seem to get sick a little easier than other people.	1	2	3	4	5
b. I am as healthy as anybody I know.	1	2	3	4	5
c. I expect my health to get worse.	1	2	3	4	5
d. My health is excellent.	1	2	3	4	5
e. My health is better than other volunteers my age.	1	2	3	4	5

**Section Two:
Participation in Leisure Time Physical Activity**

Now I would like to ask you about your participation in leisure time physical activities. Leisure time physical activities are the recreation, sport or fitness activities that you participate in during your free time away from work and volunteering. To help you answer the following questions, please refer to the list below for some examples of recreation, sport and fitness activities.

Walking for exercise (outdoor, indoor,
at mall or fitness center, treadmill)
Jogging (outdoor, treadmill)
Swimming (laps, snorkeling)
Bicycling (indoor, outdoor)
Softball/Baseball
Volleyball
Bowling (lane, lawn)
Basketball
Skating (roller, ice)
Martial arts (karate, judo)
Tai Chi
Calisthenics/Toning exercises
Racquetball/Handball/Squash
Horseback riding
Hunting
Fishing
Snow skiing (x-country or downhill)
Snow shoeing

Yoga
Aerobic dance/Step aerobic
Water aerobics
Dancing (Square, Line, Ballroom)
Gardening
Badminton
Strength/Weight training
Rock climbing
Scuba diving
Stair master
Fencing
Hiking
Tennis
Golfing
Canoeing/Rowing/Kayaking
Water skiing
Jumping rope
Other (Please specify)

1. Over the past 7 days, how often did you participate in **light** recreation, sport or fitness activities? (Examples might be walking or gardening.)

- NEVER
 ↓
 GO TO Q.#2
- SELDOM
 (1-2 DAYS)
 ↓
- SOMETIMES
 (3-4 DAYS)
 ↓
- OFTEN
 (5-7 DAYS)
 ↓

- 1a. What were these light recreation, sport or fitness activities?

- 1b. On average, how many hours per day did you participate in these light recreation, sport or fitness activities?
- LESS THAN 1 HOUR 1 BUT LESS THAN 2 HOURS
 2-4 HOURS MORE THAN 4 HOURS
- 1c. Where do you participate in these activities?

2. Over the past 7 days, how often did you participate in **moderate** recreation, sport or fitness activities? (Examples might be softball or golf.)

- NEVER
 ↓
 GO TO Q.#3
- SELDOM
 (1-2 DAYS)
 ↓
- SOMETIMES
 (3-4 DAYS)
 ↓
- OFTEN
 (5-7 DAYS)
 ↓

- 2a. What were these moderate recreation, sport or fitness activities?

- 2b. On average, how many hours per day did you participate in these moderate recreation, sport or fitness activities?
- LESS THAN 1 HOUR 1 BUT LESS THAN 2 HOURS
 2-4 HOURS MORE THAN 4 HOURS
- 2c. Where do you participate in these activities?

- I spend most of my time sitting or standing; I drive or take public transportation rather than walk, and
I am more likely to use an elevator than take the stairs.
- While my daily routine involves mainly sitting or standing, I take opportunities to get physical activity by taking the stairs rather than the elevator, walking or cycling rather than using the car or public transportation.
- My daily routine involves a moderate amount of physical activity including some walking, lifting, etc.
- My daily routine involves a great deal of physical activity including a lot of walking, lifting, etc.

11. During the past 7 days, did you work for pay?

No (GO TO Q.#12)

Yes



11a. How many hours in the past 7 days did you work for pay? _____ hours

11b. Which of the following categories best describes the amount of physical activity required on your job?

- Mainly sitting with slight arm movements.
- Sitting or standing with some walking.
- Walking, with some handling of materials generally weighing less than 50 pounds.
- Walking and heavy manual work often requiring handling of materials weighing over 50 pounds.

11c. Did you walk, bike, or drive to work?

Walk Bike Drive Other (Please specify:) _____

11d. If you drove to work, do you park farther away than necessary so you can walk the extra distance to where you work? No Yes

12. During the past 7 days, did you volunteer?

No (GO TO Q.#13)

Yes



12a. How many hours in the past 7 days did you work as a volunteer? _____hours

12b. Which of the following categories best describes the amount of physical activity required for your volunteer work?

- Mainly sitting with slight arm movements.
- Sitting or standing with some walking.
- Walking, with some handling of materials generally weighing less than 50 pounds.
- Walking and heavy manual work often requiring handling of materials weighing over 50 pounds.
- Hiking or biking, not strenuous
- Hiking or biking, strenuous

12c. Did you walk, bike, or drive to volunteer?

Walk Bike Drive Other (Please specify:) _____

12d. If you drove to volunteer, do you park farther away than necessary so you can walk the extra distance to where you volunteer? No Yes

13. Over the past 7 days, how often did you participate in sitting activities such as reading, watching TV or doing handcrafts?

NEVER



GO TO NEXT PAGE

SELDOM

(1-2 DAYS)



SOMETIMES

(3-4 DAYS)



OFTEN

(5-7 DAYS)



13a. What were these sitting activities?

13b. On average, how many hours per day did you participate in these sitting activities?

LESS THAN 1 HOUR

1 BUT LESS THAN 2 HOURS

2-4 HOURS

MORE THAN 4 HOURS

<p style="text-align: center;">Section Three: Goal Orientation</p>

For each pair of statements below, circle the one that describes you best. If neither statement applies to you, skip to the next pair of statements.

1. I concentrate all my energy on a few things.
OR
I divide my energy among many things.

2. I always focus on the one most important goal at a given time.
OR
I am always working on several goals at once.

3. When I think about what I want in life, I commit myself to one or two important goals.
OR
Even when I really consider what I want in life, I wait and see what happens instead of committing myself to just one or two particular goals.

4. When things don't go as well as before, I choose one or two important goals.
OR
When things don't go as well as before, I still try to keep all my goals.

5. When I can't do something important the way I did before, I look for a new goal.
OR
When I can't do something important the way I did before, I distribute my time and energy among many other things.

6. When I can't do something as well as I used to, I think about what exactly is important to me.
OR
When I can't do something as well as I used to, I wait and see what comes.

7. I keep working on what I have planned until I succeed.

OR

When I do not succeed right away at what I want to do, I don't try other possible ways of doing it for long.

8. I make every effort to achieve a given goal.

OR

I prefer to wait for a while and see if things will work out by themselves.

9. When something matters to me, I devote myself fully and completely to it.

OR

Even when something matters to me I still have a hard time devoting myself fully and completely to it.

10. When something doesn't go as well as it used to, I keep trying other ways of doing it until I can achieve the same result I used to.

OR

When things don't go as well as they used to, I accept it.

11. When something in my life isn't working as well as it used to, I ask others for advice or help.

OR

When something in my life isn't working as well as it used to, I decide what to do about it myself, without involving other people.

12. When it becomes harder for me to get the same results, I keep trying harder until I can do it as well as before.

OR

When it becomes harder for me to get the same results as I used to, it is time to let go of that expectation.

Circle the number that best represents the extent to which you agree or disagree with each of the following statements.

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

Section Four: Barriers and Contributors to Physical Activity

Part One: Now please take a few moments to reflect upon the *recreation, sport and fitness activities you would like to do or to do more often in your free time*. The following are reasons that people often give for their level of involvement or lack of involvement in recreation, sport and fitness activities. Please read each of these reasons and, on the 5-point scale provided, circle the number that best represents the extent to which you agree or disagree with each statement.

	Strongly Disagree				Strongly Agree
I am too shy to start an activity.	1	2	3	4	5
I don't have the energy to participate.	1	2	3	4	5
The people I know usually have too many family obligations to start an activity.	1	2	3	4	5
I have family, friends and/or acquaintances with whom to participate.	1	2	3	4	5
I am in poor health.	1	2	3	4	5
The people I know live or work too far away.	1	2	3	4	5
I would do an activity if the facilities I need are not crowded.	1	2	3	4	5
I don't have the right clothes or equipment to participate.	1	2	3	4	5
I would start an activity that my family thinks is alright.	1	2	3	4	5
I wouldn't do an activity that makes me feel uncomfortable.	1	2	3	4	5
I wouldn't do an activity if the facilities I need aren't convenient.	1	2	3	4	5
I would do an activity that my friends thought was alright.	1	2	3	4	5
The people I know usually don't have time to start an activity with me.	1	2	3	4	5
I won't do another activity if I have other commitments.	1	2	3	4	5
I wouldn't do a new activity if I don't have the time.	1	2	3	4	5
I would do an activity if I know what is available.	1	2	3	4	5

Remember, please read each of these reasons and, on the 5-point scale provided, circle the number that best represents the extent to which you agree or disagree with each statement.

	Strongly Disagree				Strongly Agree
I would do an activity that doesn't make me feel self-conscious.	1	2	3	4	5
The people I know usually have enough money to begin an activity with me.	1	2	3	4	5
I am afraid of getting hurt.	1	2	3	4	5
The people I know usually don't have enough skills to start an activity with me.	1	2	3	4	5
I would do an activity if I had money for clothes, equipment, and fees.	1	2	3	4	5
I feel comfortable participating in activities with people older or younger than me.	1	2	3	4	5
The people with whom I would participate have different work or volunteer schedules from me.	1	2	3	4	5
I am not in good enough shape to participate.	1	2	3	4	5
I wouldn't do any activity that is not in keeping with my religious beliefs.	1	2	3	4	5
I would do an activity that doesn't require a lot of skill.	1	2	3	4	5
I have a chronic illness or disability that prevents me from participating.	1	2	3	4	5
Other (please specify): _____	1	2	3	4	5

You are doing a great job! You have just a few more sections to go to complete this questionnaire. Please go to the next page to continue. →

Part Two: Following are some of the things people have told us they do to get around the obstacles they face in starting, continuing, and increasing their involvement in *recreation, sport and fitness activities*. Please read each of these statements and on the scales provided circle the number that best represents how frequently you have done or are doing the following things to try to start, continue, or increase your participation in *recreation, sport and fitness during your free time*.

	<u>Never</u>	<u>Seldom</u>	<u>Some- times</u>	<u>Often</u>	<u>Very Often</u>	<u>Does Not Apply</u>
I try to learn new activities.	1	2	3	4	5	8
I try to find people to do recreation, sport or fitness activities with.	1	2	3	4	5	8
I try to be organized.	1	2	3	4	5	8
I borrow equipment and/or clothes.	1	2	3	4	5	8
I use a babysitter sometimes to make free time.	1	2	3	4	5	8
I try to budget my money.	1	2	3	4	5	8
I arrange rides with friends.	1	2	3	4	5	8
I try to plan ahead for things.	1	2	3	4	5	8
I try to improve my skills.	1	2	3	4	5	8
I ask my family to share in the daily chores.	1	2	3	4	5	8
I set aside time for recreation, sport or fitness activities.	1	2	3	4	5	8
I save up money to do recreation, sport or fitness activities.	1	2	3	4	5	8
I have just learned to live within my means.	1	2	3	4	5	8
I do more recreation, sport or fitness activities close to home.	1	2	3	4	5	8
I have learned to participate despite an injury or physical/health conditions.	1	2	3	4	5	8

	<u>Never</u>	<u>Seldom</u>	<u>Some- times</u>	<u>Often</u>	<u>Very Often</u>	<u>Does Not Apply</u>
I prioritize what I want to do, and make my recreation, sport or fitness a priority.	1	2	3	4	5	8
I just try to work my recreation, sport or fitness into or around my other commitments.	1	2	3	4	5	8
I just swallow my pride and try my best.	1	2	3	4	5	8
I get up earlier or stay up later to make recreation, sport or fitness time.	1	2	3	4	5	8
I ask for help with the required skills.	1	2	3	4	5	8
I try to teach my kids to be more responsible and help with things.	1	2	3	4	5	8
I participate in activities with people in my age group.	1	2	3	4	5	8
Sometimes, if I need some recreation time, I just drop what I am doing and take it.	1	2	3	4	5	8
I sometimes substitute another more convenient activity for a preferred one.	1	2	3	4	5	8
I obtain treatment for an injury or health condition.	1	2	3	4	5	8
I improvise with the equipment and/or clothes I have.	1	2	3	4	5	8
I cut short the activity session time.	1	2	3	4	5	8
I try to meet people with similar interests.	1	2	3	4	5	8
I participate in activities with people of the same gender.	1	2	3	4	5	8
I try to participate in off-peak times when facilities are less busy.	1	2	3	4	5	8
I practice the required skills on my own.	1	2	3	4	5	8
I take lessons.	1	2	3	4	5	8

1. If you would like to be more physically active during your free time than you are now, what has to change to make this happen?

2. What would have to happen that would lead you to become less physically active during your free time than you are now?

<p>Section Five: Please answer the following questions about yourself.</p>

1. How old were you on your last birthday? _____
2. Are you ...
 - Male
 - Female
3. What is your height (example: 5'8 is 5 feet, 8 inches):

4. What is your weight (in pounds)? _____
5. Are you a Cleveland Metroparks volunteer?
 - If NO, What organization do you volunteer for, if any? _____
 - If YES, What Metroparks volunteer program do you participate in? (Mark all that apply.)
 - Zoo
 - OWLS mentor
 - OWLS tutor
 - OWLS hike/bike
 - Volunteer, but not affiliated with Zoo or OWLS program
- 5a. Why do you volunteer? _____

6. Do you live alone or with others?
- Alone
 - With others
7. Are you ... (check all that apply)
- American Indian or Alaskan Native
 - Asian American
 - Black or African American
 - Native Hawaiian or Other Pacific Islander
 - White
 - Hispanic, Spanish or Latino
8. What is the highest level of education you've completed?
- Graduate or Professional Degree
 - Bachelor's Degree
 - Associate's Degree
 - Some College
 - High School Degree
 - Some High School
 - 8th grade or less
9. What was your household income in 2004?
- \$0-\$24,999
 - \$25,000-\$49,999
 - \$50,000-\$74,999
 - \$75,000-\$99,999
 - more than \$100,000
10. What is your marital status?
- Married
 - Divorced
 - Widowed
 - Living with partner
 - Never married
11. What is your work status? (Paid, non-volunteer work.)
- Work full-time
 - Work part-time
 - I am retired

12. Are you the primary caregiver of a family member or friend? (A primary caregiver provides assistance with one or more daily activities, such as running errands, cleaning, and cooking.)

- No
- Yes → How many years have you been the primary caregiver? _____

13. Do you have a chronic illness or disability?

- No
- Yes → Please describe: _____

14. Do you have children ages 17 or younger living with you?

- No
- Yes → How many? _____
What is your relationship to the child (children)? _____

**Thank you for completing this questionnaire.
We really appreciate your participation!**

Department of Recreation, Park and Tourism Management
The Pennsylvania State University
201 Mateer Building
University Park, PA 16802

(On a separate page:)

Raffle

If you are interested in being entered into a drawing for one of several prizes, including a \$25 gift certificate to Barnes & Noble, please indicate your name and phone number below. This information will be separated from your survey to ensure that your responses are not linked to your identifying information.

Name: _____

Phone Number: _____

Mailing Address: _____

Participate in another Research Project

If you may be interested in participating in another study in the future, please indicate your contact information below. This information will be separated from your survey to ensure that your responses are not linked to your identifying information.

Name: _____

Phone Number: _____

Mailing Address: _____

Vita

Julie Stafford Son

EDUCATION

The Pennsylvania State University
University of Nevada, Reno
Whitman College

Ph.D. in Leisure Studies, Minor in Gerontology, 2006
M.A. in Sociology, Cognate in Social Psychology, 1999
B.A. in Psychology, Minor in English, 1996

EXPERIENCE

Fall 2005-Summer 2006

Kligman Doctoral Fellow

Department of Recreation, Park and Tourism Management, The Pennsylvania State University

Fall 2002-Spring 2005

Graduate Assistant

Department of Recreation, Park and Tourism Management, The Pennsylvania State University

October 1999-August 2002

Education and Research Coordinator

Sanford Center for Aging, University of Nevada, Reno

August 1996-September 1999

Graduate Assistant

Department of Psychology; Nevada State Demographer's Office; Sanford Center for Aging
University of Nevada, Reno

SELECTED PRESENTATIONS

Son, J. S. (presenter), Mowen, A., & Kerstetter, D. (2006). The relationship of volunteerism to the physical activity and health of older adults in a metropolitan park setting. Northeastern Recreation Research Symposium, April 9-11, Lake George, New York.

Son, J. S. (presenter), Kerstetter, D., Mowen, A., & Payne, L. (2005). Selection, optimization, and compensation for physical activity in later life. Gerontological Society of America, November 18-22, Orlando, Florida.

Son, J. S. (presenter), Yarnal, C. M., Kerstetter, D., Yen, I., Hampton, R., Baker, B., & Chick, G. (2005). The Red Hat Society: Characteristics that may promote successful aging for women and implications for programming. Leisure & Aging Poster Session, National Recreation and Park Association, October 18-22, San Antonio, Texas.

Stafford, J. A. (2004). The importance of leisure for good health: Native American elders' perspectives. Gerontological Society of America, November 19-23, Washington, DC.