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Do Age and Gender Matter in the Constraint Negotiation of Physically Active Leisure?

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Abstract

Our purpose in this study was to examine the relationships between age, gender, leisure constraint, leisure constraint negotiation, motivation, and physically active leisure for 271 older (50+) volunteers and visitors of a Midwestern metropolitan park agency. The primary objectives were: 1) to assess the relationship of age and gender to leisure constraint; 2) to examine the relative importance of all factors to active leisure participation; 3) to test negotiation as a mediator of the relationships of constraint and motivation to participation; and 4) to determine whether these relationships differed by frequency and duration. The inclusion of age, gender and multiple measures of physically active leisure revealed distinct relationships. The implications of these findings for park-based programs and settings for active leisure in mid to late life are discussed.

KEYWORDS: *Leisure time physical activity, middle-aged and older adults, motivation, outcome expectations, activity frequency and duration*

Introduction

Physical activity provides a multitude of health benefits, including increased longevity and independence (Lee, Paffenbarger, & Hennekens, 1997; Shephard, 1997) as well as positive physical (Chandler & Hadley 1996; Oguma, Sesso, Paffenbarger, & Lee, 2001) and mental health (Morgan & Bath, 1998; Patterson & Chang, 1999) outcomes in later life. Even so, the majority of U.S. adults do not get adequate amounts of physical activity (CDC: Centers for Disease Control, 2000a), and older adults participate in the lowest levels of physical activity across all age groups (CDC, 2000b). Understanding which factors influence physical activity participation in mid to late life may highlight possible solutions to increasing participation in these populations. Further, elucidating the factors that contribute to the frequency of participation and

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the duration of an activity session, as well as their interrelationship, may enhance leisure professionals' ability to develop successful programs for physically active leisure opportunities for people 50 and older. For instance, understanding the role of negotiation strategies in helping middle-aged and older adults overcome constraints to active leisure participation would help inform "best practice" programs. Additionally, understanding whether the constraint negotiation process differs between participation frequency and activity duration would enhance the development of appropriate negotiation strategy building and motivational training for physically active leisure to improve the health and well-being of people 50 and older.

The Leisure Constraint Negotiation Process

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 thought to exist 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 et al. (1991) later developed a hierarchical model of leisure constraints, with three main extensions to the earlier conceptualization: 1) explicit articulation of constraint negotiation, in which people utilize various strategies to overcome constraints; 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 constraint 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), particularly individuals 50 and older, and multiple methodologies (Samdahl & Jekubovich, 1997).

Based on Jackson et al.'s (1993) propositions, Hubbard and Mannell (2001) tested four competing models on the role of constraint, 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 constraint. Constraint negatively influenced participation and, at the same time, positively influenced the use of negotiation resources and strategies; there was partial mitigation of the negative effects of constraint on participation through negotiation. Therefore, negotiation partially mediated the relationship between constraint and physically active leisure. Their results provided support for the notion that people with higher levels of perceived constraint may not only still partici-

pate but may actually participate *more* than people with lower constraint levels (Kay & Jackson, 1991; Shaw et al., 1991).

The inclusion of motivation into the hierarchical constraints model and the elaboration of its possible influence on leisure preferences and level of leisure activity participation have helped clarify the relationships between constraint, negotiation, motivation and 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 constraint was negatively associated with participation. Alexandris et al. (2002) also found that intrapersonal constraint 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 there was no relationship between interpersonal and structural constraint and motivation type nor between any of the constraint domains and extrinsic motivation.

Hubbard and Mannell (2001) found that outcome-based motivation (the expectation of health and enjoyment benefits) had an indirect effect, through negotiation, on physically active leisure 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 little research on the role of motivation in the context of constraint 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 constraint and negotiation. Further, Hubbard and Mannell (2001) suggested that additional research is needed to test models of leisure constraint, negotiation, and motivation with different samples. There is also a lack of research on the role of motivation in the context of age, gender and the specific subdimensions of physical activity (e.g., frequency and duration). Specifically, there appear to be no studies examining the role of motivation in the leisure constraint negotiation process for people 50 and older nor any that compare how these processes might be different for men and women. Moreover, there are no constraint negotiation studies examining the multiple subdimensions of physical activity.

Physical Activity, Participant Characteristics and Leisure Constraints

Research in the public health field indicates that participation in physically active leisure differs depending on age and gender; older adults and women tend to have lower levels of physical activity (see Rhodes et al., 1999 for a review). Leisure researchers have documented similar results and have suggested that researchers account for sociodemographic factors—such as age and gender—when studying leisure constraint and physically active leisure (Jackson, 2000; Shaw & Henderson, 2005). Leisure researchers have identified age as a predictor of active leisure participation and sex differences in the frequency and duration of physically active leisure. For instance,

Stanley and Freysinger (1995) found that women had a lower frequency of 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 et al. (1991) found that women's weekly duration of physical activity was lower than was men's. They also found that age accounted for 8% of the variance in physical activity participation. Providing further support for examining age, gender and leisure constraint, Jackson and Henderson (1995) found that women were more constrained in their physical activity than men irrespective of age. However, in a study of older Greeks, Alexandris, Barkoukis, Tsorbatzoudis, and Grouios (2003) did not find gender differences in constraints to participate in a physical activity program. Therefore, although studies consistently show that women and older adults have lower levels of physically active leisure, the relationships between gender, age and leisure constraint are less clear.

In particular, there has been limited research regarding the influence of age on overall levels of leisure constraint (Alexandris et al., 2003). Most research has revealed different patterns of age differences by constraint type (Alexandris & Carroll, 1997; Jackson, 1993; McGuire, Dottavio, & O'Leary, 1986; Searle & Jackson, 1985). For example, intrapersonal constraint may increase with age (Alexandris & Carroll, 1997; Searle & Jackson, 1985) whereas finance-based structural constraint may decrease with age (Jackson, 1993). Scott and Munson (1994) found that age predicted several constraints to park usage: poor health, no one to go with, and lack of transportation were all positively associated with age. Additionally, Mowen, Payne and Scott (2005) found that age was a significant predictor of several constraints for two cross-sections of adults in 1991 and 2001.

These studies provide some insight into the role of age and gender on constraints and on physically active leisure. However, the influence of age and gender in the constraint negotiation process of physically active leisure has not been investigated. Therefore, the present study had two broad aims in relation to age and gender. One central aim was to examine the possible relationships of age and gender on constraint in an attempt to clarify these relationships. Based on Jackson and Henderson (1995), we hypothesized that women would have higher perceived constraint for physically active leisure than men. We also expected that age would be related to overall constraint levels, although the directionality of this possible relationship is unclear because of the different patterns of constraints observed across age. Another aim was to control for the effects of age and gender in the examination of the constraint negotiation process of physically active leisure with the expectation that, similar to previous research, age and gender would have negative effects on leisure participation.

Multidimensionality of Physically Active Leisure

There has been little research examining the roles of constraint and negotiation on multiple subdimensions of physically active leisure. Instead, studies have tended to use a single measure 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). However, not all studies have used singular measures. Shaw et al. (1991) used measures of both frequency and duration of physically active leisure participation, finding sex differences in weekly activity duration.

Utilizing measures that incorporate the multiple subdimensions of physically active leisure has both intuitive appeal and theoretical value. In the latter case, using multidimensional measures of physically active leisure may lead to more accurate empirical tests of explanatory factors and their relative importance. Constraint researchers (Jackson & Henderson, 1995; Kay & Jackson, 1991; Mannell & Zuzanek, 1991; Raymore et al., 1993) have suggested that time may constrain both the frequency and duration of physically active leisure. However, the degree to which various constraints influence activity 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 at the same frequency but for shorter durations each activity session 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.

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 have not utilized 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. In sum, 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. 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 constraint, 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., constraint, negotiation and motivation) and the duration of activity participation.

Additionally, 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 participation. Hence, one goal of the present study was to compare the effects of the study factors on a multidimensional, composite measure of physically active leisure as well as on the subdimensions, frequency and duration. This comparison allowed us to determine whether any relationships changed depending on the physical activity measure examined.

Study Purpose, Research Objectives and Research Questions and Hypotheses

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

The specific hypotheses were as follows:

1. Age will be negatively related to overall participation in physically active leisure.
2. Female gender will be negatively related to overall participation.
3. Female gender will be positively related to constraint.
4. Constraint will be negatively related to overall participation.
5. Negotiation will mediate the negative influence of constraint on overall participation.
6. Negotiation will mediate the positive influence of motivation on overall participation.
7. Participation frequency will positively influence activity duration and thereby mediate the relationships between the independent variables and activity duration.

The objectives of this study, and the attendant hypotheses, are intended to further our understanding of the constraint negotiation process of physically active leisure for adults 50 and older. In turn, an enhanced understanding of the process of active leisure in mid to late life may help inform the development of successful leisure-based physical activity programs.

Methods

Respondents and Procedure

A convenience sample of 271 volunteers and visitors of a Midwestern metropolitan park agency aged 50 and older comprised the study sample. Volunteers were

targeted for study inclusion because the park agency wanted to learn more about its older volunteers and their participation in physically active leisure. In an attempt to recruit park volunteers, approximately 500 older park volunteers were notified via mail and, where possible, e-mail (Dillman, 1999). Notifications described the study and the location and dates of sessions held at the following locations: 1) two special event sites, 2) four park visitor centers, and 3) the agency's September zoo volunteer meeting. Park visitors were recruited through banners posted on the research booth at the special event sites and the entryways at the park offices, advertising 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.

Individuals were asked to complete an on-site self-administered questionnaire in September, 2005 during two community-wide, free special events held by the agency, as well as during group-administered survey sessions at five park 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 as determined by prior surveys. The volunteer sessions were held at the park 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). On-site respondents 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 offices for potential park volunteers 50 and older to complete and return via mail.

Of the 339 questionnaires that were distributed, 298 questionnaires were returned, for a response rate of 88%. The response rate for park volunteers 50 years of age and older was 30%. We received 242 surveys from on-site data collection and 56 surveys from mail returns. For the on-site returns, we received 141 surveys from the two special events and 101 surveys from the park sessions. Twenty-three of the surveys were not included in the present analyses because they had data missing not at random (MNAR; Schafer & Graham, 2002), with 50% or more missing data on two or more scales. Of the remaining 275 surveys, four were omitted because of extreme physical activity scores (i.e., raw physical activity scores higher than 145, with a range of 0 to 179), resulting in a total sample of two-hundred seventy-one.

Instrumentation

Study constructs examined were constraint, negotiation, motivation and physically active leisure.

Constraint and Negotiation. Constraint was measured with a modified version of the Hubbard and Mannell (2001) Leisure Constraint Scale, omitting items that referenced 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 are, "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

Leisure Constraint Scale had acceptable reliability, with a coefficient alpha of .72.

Negotiation was measured using the Hubbard and Mannell (2001) Negotiation Strategies Scale, also omitting items that referenced workplace exercise programs and modifying the statements for consistency with the terminology used in the physical activity questions. Negotiation strategies included time management, skill acquisition, interpersonal coordination, and financial management. Some examples of negotiation 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. 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 outcome expectation-based 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). We used Hubbard and Mannell's two motivation items to provide standardization to aid study comparisons.

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 subscale 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 in the past seven days) and duration (1-4; 4-point ordinal scale of hours in the past seven days) of physical activity as well as an open-ended question about the type(s) of activity (e.g., swimming, walking, golfing).

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.

Following the procedures outlined by the PASE scoring manual, a weighted sum score (i.e., composite) across frequency, duration, and intensity was computed for the variable, "overall physically active leisure." First, a conversion table was used to deter-

mine 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).

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).

Data Analysis

The overall measure of physically active leisure and the duration subdimension were non-normal (with positive skew) and did not meet ordinary least squares assumptions. We transformed these measures 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 suggested that there was substantial variance in the sample for the negotiation items, including items on negotiating familial obligations. Because all items were relevant to this sample, 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 (Figures 1 and 2). 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 of age and gender to constraint were also included.

The first structural equation model (Model 1) consisted of six variables: constraint, negotiation, motivation, age, gender, and physical activity participation (Figure 1). Age, gender, and physical activity participation were single-indicator variables and constraint, negotiation and motivation were multiple-indicator variables. The three indicators for constraint 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

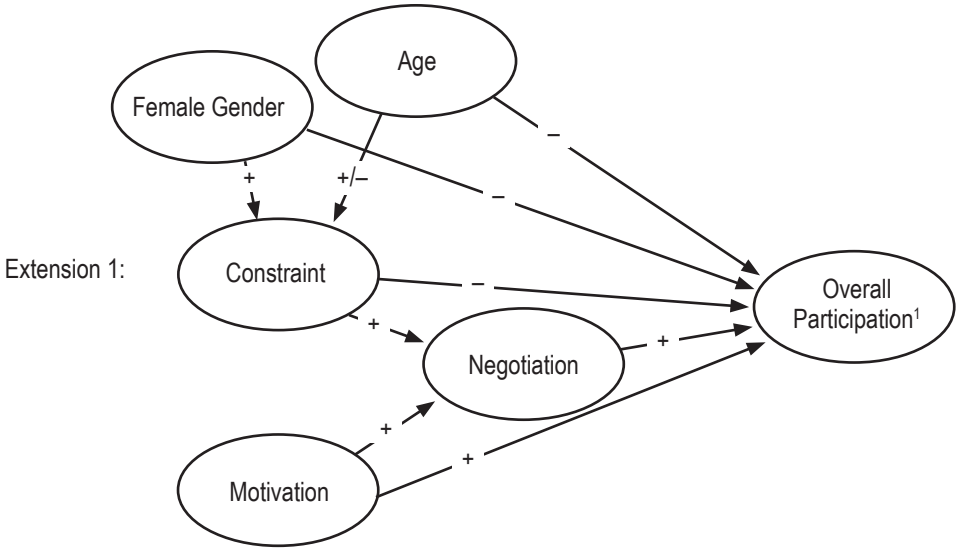

Figure 1. Model 1: Hypothesized model for overall level of physically active leisure.

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

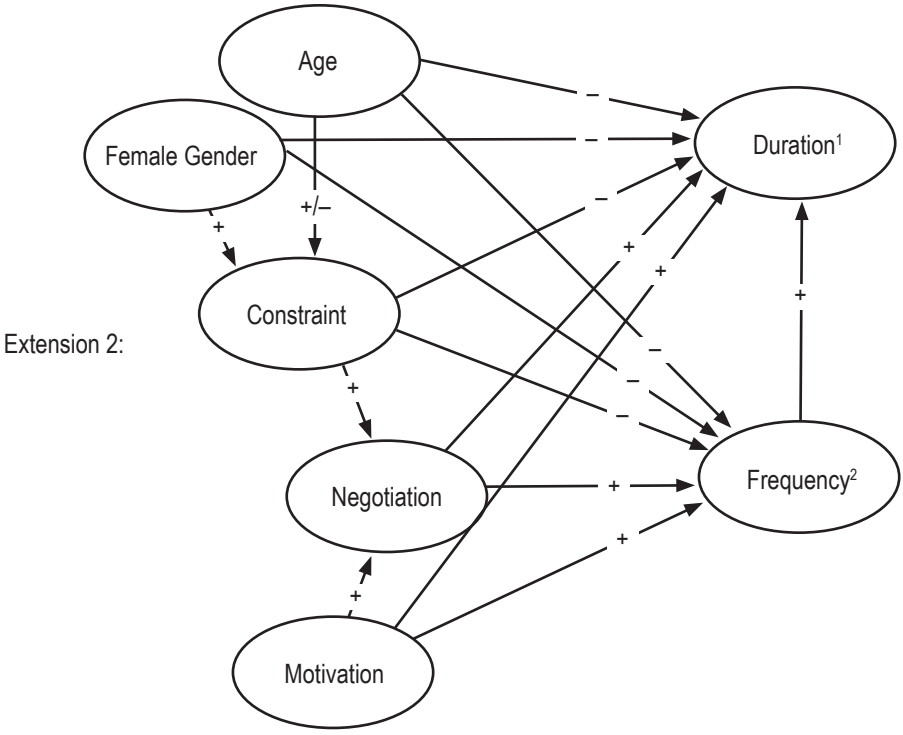

Figure 2. Model 2: Hypothesized model for the frequency and duration subdimensions.

[1] *Square root transformation of duration score across intensity levels.*

[2] *Untransformed frequency score across intensity levels.*

variables for the first model. The second structural equation model (Model 2) included the single-indicator frequency and duration measures in place of the overall physical activity measure (Figure 2). 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).

Results

Sub-sample Comparisons

A comparison of sub-sample characteristics indicated that the park visitor and park volunteer sub-samples had similar levels of constraint, negotiation, motivation, and physical activity, and had similar gender distributions. The only statistically significant difference between the two sub-samples was age; park volunteers were approximately three years older on average than park visitors. Due to their similarities, the sub-samples were combined into one sample for the purposes of the data analyses.

Respondent Profile and Descriptive Data

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 white (96%, n = 259) and married (64%, n = 173). Approximately half (51%) of the sample had a college or university education, with a little more than a quarter (27%) attaining graduate-level or professional degrees. Nearly half of the sample had a household income of $50,000 or more (45%). Fifty-five percent of the respondents were retired, 30% worked full-time, and 11% worked part-time.

The respective average overall levels of constraint and negotiation were 2.66 (SD = .46) and 2.89 (SD = .49) on a 5-point scale, with 5 representing "strongly agree" or "very often," respectively. On average, the sample was moderately constrained and utilized moderate levels of negotiation strategies. The mean level of motivation for enjoyment and health combined was 4.13, on a 5-point scale, with 5 indicating that the respondent participates or would like to participate in physical activity "very much." 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. These scores indicate that, on average, respondents participated 3 or more days per week and engaged in physical activity for 2 or more hours per week.

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 constraint and, likewise, financial negotiation is expected to have some commonality with structural constraint. Therefore, because these relationships support theoretical conceptualizations, 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 cutoff values of $p < .05$.

Model 1: Mediation of Overall Levels of Physically Active Leisure. Age and gender did not have significant effects on constraint (ß = -.05 and ß = .01, p > .05, respectively). Similarly, negotiation did not have a significant influence on the relationship between constraint and overall levels of physical activity in this sample (ß = .06, $p > .05$). Figure 3 depicts the reduced model with the nonsignificant paths removed. It shows the direct effects of age, gender, constraint 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 (ß = .10) was significant at the $p < .01$ level. Motivation accounted for 13% of the variance in the utilization of negotiation strategies and resources.

There were significant direct effects for all of the variables on overall physical activity scores. Constraint was the most significant independent predictor (ß = -.30, $p < .001$), followed by negotiation (ß = .28, $p < .001$), age (ß = .16, $p < .01$) and motivation (ß = .14, $p < .05$). Gender was also a significant predictor (ß = -.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 (constraint as

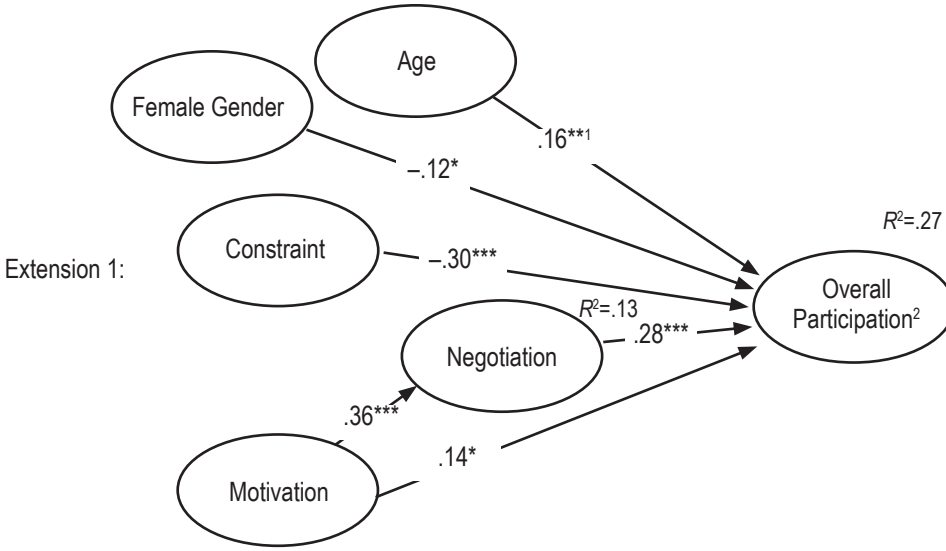

Figure 3. Model 1: The role of age, gender, constraint, negotiation and motivation on overall level of physically active leisure: Final model.

Note. The indicators and error variances of the factors are not displayed for simplification.
*[1] *** p < .001, ** p < .01, * p < .05*
[2] Square root transformation of physical activity sum score across frequency, duration and intensity

mediator), 2) the direct and indirect effects of constraint 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). Figure 4 depicts the reduced model. This model was a good fit of the data (χ^2/df = 1.65, CFI = .96, RMSEA = .05), accounting for 27% of the variance in frequency and 55% of the variance in duration.

Negotiation, constraint, and female 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 (ß = .38, $p < .001$), followed by constraint (ß = -.31, $p < .001$), and gender (ß = -.13, $p < .05$). Age and motivation were not significant independent contributors to frequency.

Similar to the results presented in *Model 1* (Figure 3), negotiation did not account for the relationship between constraint and frequency. In contrast, 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 ß = .14, significant at the $p < .001$ level.

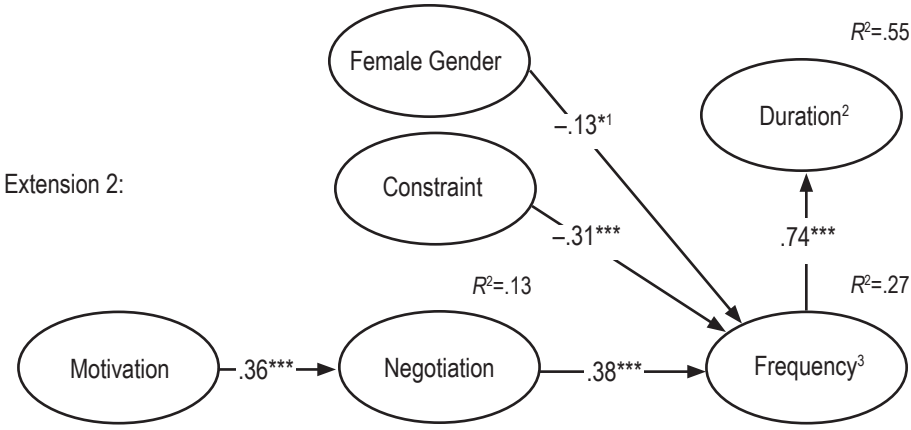

Figure 4. Model 2: The role of age, gender, constraint, negotiation and motivation on frequency and duration: Final model.

Note. The indicators and error variances of the factors are not displayed for simplification.
*[1] *** p < .001, ** p < .01, * p < .05*
[2] Square root transformation of duration score across intensity levels
[3] Untransformed frequency score across intensity levels

Frequency of participation in the past seven days was strongly related to duration level in the past seven days (ß = .74, $p < .001$). The direct effects of negotiation, constraint 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 (ß = .28, $p < .0001$), followed by constraint (ß = -.23, $p < .0001$), and gender (ß = -.10, $p < .05$). Age and motivation were not significantly related to duration.

Discussion

The Role of Age and Gender on Leisure Constraint

Previous research has suggested that age is related to leisure constraint. For example, researchers have shown that intrapersonal constraint increases with age (Alexandris & Carroll, 1997; Searle & Jackson, 1985) whereas financial constraint decreases with age (Jackson, 1993). However, the relationship between overall degree of constraint (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 constraint levels. This finding indicates that level of perceived constraint is not significantly higher for older adults as compared to middle-aged adults in this sample. Perhaps most people identify and utilize strategies to overcome constraints by midlife. Alternatively, perhaps middle-aged and older adults experience a similar degree of constraints even though specific constraints to their participation differ. More specifically, it is possible

that middle-aged and older adults might experience different levels of the constraint sub-domains (e.g., intrapersonal constraint) although their overall constraint levels are similar. An examination of the differences between middle-aged and older adults on specific constraints as well as the constraint sub-domains would be worthwhile. Additionally, research using a more age-diverse, representative sample might examine the overall constraint-age relationship to explore its generalizability.

Similar to Alexandris et al.'s finding (2003), there was no evidence of gender differences in constraint among 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. Mean sub-scale scores for intrapersonal, interpersonal and structural constraints were used in this study rather than subscales based on a different conceptualization of constraints or individual item scores. Therefore, an examination of alternative sub-scales or the individual items 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.

Does Negotiation Mediate Constraint and Motivation for Physically Active Leisure in Mid to Late Life?

Unlike previous research (Hubbard & Mannell, 2001), the results of this study did not find support for negotiation as a mediator of the relationship between perceived constraint 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 might not have followed 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, constraint was strongly and directly related to participation but was not significantly related to negotiation. 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 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 focused on enhancing physically active leisure.

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 the multidimensional measure of physically active leisure that included frequency, duration and intensity. Including the effects of age and gender uncovered this direct relationship, for in an otherwise identical model that did not control for age and gender effects, only the indirect relationship surfaced (Son, Mowen, & Kerstetter, in press). The study results suggest that motivation may have a direct influence on participation but only when participation reflects intensity levels and controls for age and gender effects. Hence, including intensity levels in the measurement of physical activity led to the conclusion that motivation was directly related to participation whereas using a simpler, unidimensional measure such as frequency led to the conclusion that motivation was only

indirectly related to participation. Similarly, including age and gender revealed that motivation was directly related to overall participation whereas omitting these factors only revealed an indirect motivation-participation relationship.

Even so, the indirect effects of motivation through negotiation were significantly related to both the multidimensional measure of physical activity and the frequency subdimension, when controlling for age and gender. 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 enjoyment and health benefits 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 constraint negotiation theory to incorporate age and gender effects as well as the nuances of multiple measures and subdimensions of physically active leisure. They also underscore the importance of finding ways not only to enhance, but also to sustain, motivations to engage in physically active leisure. Maintaining motivation levels is an important goal for effective leisure education and health promotion programs. Further, exploration of the process of constraint, negotiation and motivation across the lifespan may reveal important distinctions by age and gender that will provide insight into the best ways to develop, implement and evaluate programming.

Does Frequency Mediate the Relationships of the Predictors to Duration?

As expected, physical activity frequency levels over the past seven days were highly associated with duration of participation over the past seven days. 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 constraint, 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. Constraint and negotiation affected the frequency of participation, with constraint decreasing and negotiation 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 exerts a stronger influence on frequency levels than constraint does, duration levels will increase. 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.

The importance of physical activity as a contributor to health is widely accepted (CDC, 2004; Center for the Advancement of Health [CAH], 2006). However, al-

though the CDC provides recommendations according to frequency, duration and intensity (CDC, 2006), there is relatively little understanding about the ways these subdimensions may interact to contribute to positive health outcomes for people 50 and older. 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. Utilizing a meta-analysis, Green and Crouse (1995) 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 constraint 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, constraint, negotiation, and motivation were all significant independent contributors to overall levels of physically active leisure. However, only gender, constraint and negotiation were significant independent contributors to the physical activity frequency subdimension. Negotiation was the most important independent contributor to overall physically active leisure whereas constraint was the most influential contributor to the physical activity frequency subdimension. In both cases, these two factors provided countervailing forces on participation; constraint 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, constraint, 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 through negotiation strategies. These findings underscore the importance of motivation levels in increasing physically active leisure and support the continued study of motivations in future constraint negotiation research (e.g., Jackson et al., 1993; Mannell & Loucks-Atkinson, 2005). In addition, future research should include a wider range of motivation items, rather than just health and enjoyment motives, to investigate physically active leisure participation in mid- to late-life. Perhaps we would have had different results using a more exhaustive measure of motivations.

Collectively, these findings suggest that leisure service organizations 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 benefit-based motivations (expectations about the benefits of participation) and negotiation strategies in support of participation efforts. However, further research is needed with a representative sample of adults 50 and older before making changes to practice models.

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 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, leisure activities retired older adults likely have more time to do than pre-retirement middle-aged adults. The main criterion for designation as physically active leisure was that these activities occurred during one's free time, aside 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 scaled ordinally rather than intervally, which did not allow for a more sensitive 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 constraint, leisure negotiation, motivation, and physically active leisure. While this study provided insights into the role of constraint negotiation on physically active leisure, it also generated additional questions. For example, although this study did not find a significant relationship between constraint and negotiation, it is still unclear whether or not negotiation might explain, at least in part, the relationship between constraint and physically active leisure for other age-distinct, more age-diverse, or racially and ethnically diverse samples. In addition, the role of motivation on participation appears to depend on how leisure activity participation is measured; when controlling for age and gender, motivation was directly and indirectly related to overall physical activity but only indirectly related to the activity 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 constraint in other samples, particularly in a representative sample of people 50 and older.

The results of this study reinforce the notion 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, to name a few. Future research should continue to validate and extend Hubbard and Mannell's model to include factors that advance the current state of knowledge on the constraint negotiation process.

The use of middle-aged and older park volunteers and park visitors had both advantages and disadvantages in this study. One of the advantages of using this 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, constraint, negotiation, and motivation for physically active leisure in mid to late life, 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 constraint and the motivation-negotiation process. On the other hand, a disadvantage of using this nonprobability sampling strategy was that we cannot generalize these results beyond the study sample. We cannot say whether we would find similar results with a probability sample of adults aged 50 and older in this metropolitan park system, let alone a probability sample of this age group using parks in different locations. Also, we cannot generalize to the general U.S. population of people 50 and older. Another disadvantage of this sampling strategy was the homogeneity of the respondents, particularly notable in terms of race/ethnicity and income. In particular, 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 through the use of probability sampling techniques to determine whether or not these models of physically active leisure may be applied more broadly.

Overall, this study suggests that age and gender are important factors in the constraint negotiation process of physically active leisure for adults 50 and older. Specifically, the inclusion of age and gender in the model revealed a direct relationship between motivation and overall level of physically active leisure. Future research is needed that continues to explore the interplay of social psychological and sociodemographic factors on physically active leisure utilizing different leisure settings and multidimensional participation measures with diverse populations. Greater understanding of these processes has the potential to provide important insights into the planning, implementation and evaluation of leisure-based physical activity programs.

References

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.

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.

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*, 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/ 0047596.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

CDC. (2006). Physical activity for everyone: Recommendations: How active do adults need to be to gain some benefit? Retrieved December 4, 2006, from http://www.cdc.gov/nccdphp/dnpa/physical/recommendations/adults.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.

Dillman, D. A. (1999). *Mail and internet surveys: The tailored design method* (2nd ed.). New York: John Wiley & Sons.

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*, 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*, 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*, 62-68.

Jackson, E. L., Crawford, D. W., & Godbey, G. (1993). Negotiation of leisure constraints. *Leisure Sciences, 15*, 1-11.

Jackson, E. L., & Henderson, K. A. (1995). Gender-based analysis of leisure constraints. *Leisure Sciences, 17*, 31-51.

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*, 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*, 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.

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*, 538-544.

Morgan, K., & Bath, P. A. (1998). Customary physical activity and psychological wellbeing: A longitudinal study. *Age and Ageing, 27*(Suppl. 3), 35-40.

Mowen, A. J., Payne, L. L., & Scott, D. (2005). Change and stability in park visitation constraints revisited. *Leisure Sciences, 27*, 191-204.

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*, 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*, 397-411.

Samdahl, D. M., & Jekubovich, N. J. (1997). A critique of leisure constraints: Comparative analyses and understandings. *Journal of Leisure Research, 29*, 430-452.

Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods*, *7*, 147-177.

Scott, D. (1991). The problematic nature of participation in contract bridge: A qualitative study of group-related constraints. *Leisure Sciences, 13*, 321-336.

Scott, D., & Munson, W. (1994). Perceived constraints to park usage among individuals with low incomes. *Journal of Park and Recreation Administration, 12*, 79-96.

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.

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. Son, J. S., Mowen, A. J., & Kerstetter, D. L. (in press). Testing alternative leisure constraint negotiation models: An extension of Hubbard and Mannell's study. *Leisure Sciences*.

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.

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. (2002). Physical activity in older women of color. *Topics in Geriatric* Rehabilitation, *18*, 21-33.