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The Role of Facilitators in the Constraint Negotiation of Leisure-Time Physical Activity

Julie S. Son, Ph.D., University of Idaho

Guangzhou Chen, M.S., University of Illinois at Urbana-Champaign

Toni Liechty, Ph.D., University of Illinois at Urbana-Champaign

Megan C. Janke, Ph.D., East Carolina University

Stephanie T. West, Ph.D., James Madison University

Jen D. Wong, Ph.D., Ohio State University

Jill J. Naar, Ph.D., Appalachian State University

Address Correspondence to:

Julie Son
Recreation, Sport, and Tourism Management
Department of Movement Sciences
University of Idaho
jstaffordson@uidaho.edu
(208) 885-7155

Author Note:

Julie Son, OrcidID: 0000-0002-3939-7370

Stephanie West, OrcidID: 0000-0002-7740-0040

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Abstract

There is substantial research on the constraint negotiation of leisure, including research on leisure-time physical activity (LTPA) and some research exploring different aspects that might affect the constraint negotiation process, including self-efficacy and identity. However, despite longstanding conceptualization and theory, there is a lack of empirical research on the role of facilitators in the constraint negotiation process. The purpose of this study was to examine the role of facilitators in the constraint negotiation of LTPA in a national sample of 1,207 middle-aged and older adults. Path analysis results indicated that the relationship between facilitators and LTPA was fully mediated by constraint and negotiation. These findings provide one of the first empirical studies of facilitators in the constraint negotiation of LTPA and have practical implications for LTPA programming in community settings.

Keywords: Middle-aged and older adults, facilitators, enablers, constraints, physical activity and sport

The Role of Facilitators in the Constraint Negotiation of Leisure-Time Physical Activity

Leisure plays an important role in the health and well-being of older adults (Heo et al., 2013; Walsh et al., 2019). More specifically, participation in leisure-time physical activity (LTPA) has been linked to a range of positive outcomes in later life (Kosteli et al., 2016). Regular participation in LTPA generates physical benefits such as better sleep, prevention of chronic diseases, increased life expectancy, and faster post-illness recovery (e.g., Kosteli et al.; Tulle & Dorrer, 2012; Withall et al., 2020). Research has also shown that older adults experience positive psychological outcomes from LTPA, such as improved mood and a sense of accomplishment (Kim et al., 2020; Kosteli et al.). Furthermore, LTPA group activities (e.g., team sport) help older adults expand their social networks and develop more meaningful interpersonal connections (Choi et al., 2018; Liechty et al., 2019; Raynor et al., 2020). Despite the extensive documentation on the value of LTPA in later life, many older adults do not meet the minimum recommended guidelines of 150 minutes of moderate intensity PA per week (Centers for Disease Control and Prevention [CDC], 2016). Research is therefore needed to better understand how leisure service providers can effectively promote increased participation (Liechty et al.).

Numerous scholars have explored the constraints that hinder older adults' participation in LTPA, such as lack of access to facilities, insufficient social support, poor health, or lack of information on adequate programs for their age group (Bethancourt et al., 2014; Horne & Tierny, 2012). Scholars have called for increased research into the factors that facilitate LTPA participation in later life (Liechty et al., 2019). For example, research by the authors (Choi et al., 2018; Liechty et al., 2016; Naar et al., 2017; Wong et al., 2019) highlighted several factors that encouraged older adult sport participation including a fun and enjoyable atmosphere, opportunities to stay active, supportive social networks, and access to programs/leagues that

were tailored to older adults. In order to promote increased participation in LTPA, it is important to understand the constraints that need to be mitigated, the factors that encourage participation, and the relationship between these factors. To conceptualize this issue, Raymore (2002) proposed the term “facilitators” to understand what factors enable or encourage leisure participation. Previous research has investigated the relationship between leisure constraints and constraint negotiation in the context of LTPA, as well as factors that might play a role in constraint negotiation including self-efficacy (Mannell & Loucks-Atkinson, 2005) and identity (Son et al., 2009). However, earlier conceptual and analytical modeling of these relationships does not include the role of facilitators and, moreover, there is limited research into these relationships with older adults’ LTPA. The primary purpose of this study was to examine facilitators in the process of constraint negotiation of LTPA among older adults.

Literature Review

Leisure Constraints

Leisure studies scholars use the term “leisure constraints” to refer to factors that hinder participation, preferences, and experiences of leisure. These are often categorized into three types of constraints, namely, intrapersonal, interpersonal, and structural constraints (Crawford et al., 1991). Intrapersonal constraints are related to traits or aspects of individuals themselves, such as shyness, lack of energy, and being out of shape (Hubbard & Mannell, 2001). Interpersonal constraints involve interaction with others, including lack of potential activity partners, time conflict with activity partners’ schedules, and activity partners’ inadequate skills (Hubbard & Mannell; Son et al., 2008a). Structural constraints are limiting factors in the external environment, such as lack of equipment, lack of affordable options, and the absence of infrastructure (Hubbard & Mannell; Son et al.).

Even if individuals are subject to leisure constraints, they may be able to maintain a certain level of leisure participation (e.g., Son et al., 2009). A possible explanation for this phenomenon is that people use resources and strategies to overcome or negotiate constraints (i.e., constraint negotiation) (Hubbard & Mannell, 2001; Jackson et al., 1993). In a study conducted by Hubbard and Mannell, constraint negotiation was divided into four types: time management, skill acquisition, interpersonal coordination, and financial consideration. Time management includes shortening the activity session and/or getting up earlier while skill acquisition includes learning the required skills for a given leisure activity. An example of interpersonal coordination is trying to engage in leisure activities with people who have similar interests while a good illustration of financial management is finding a less expensive option (Hubbard & Mannell).

Although studies focused on older adults' constraints to active leisure are limited (see Son et al., 2008a, 2008b as exceptions), scholars from health sciences and gerontology have used an analogous concept, barriers, to understand the lack of LTPA among older adults (Cerin et al., 2010; Dare et al., 2018; Kirby & Kluge, 2013; Kosteli et al., 2016). Most older adults are aware of the benefits of participation in LTPA, however, they face more barriers to LTPA compared with other age demographics (Prohaska et al., 2006). Kosteli et al. conducted focus group interviews with older adults in the UK on barriers to older adults' LTPA participation and found that they have personal and social-environmental barriers. Personal barriers included family responsibilities, pain, low motivation, disorganized daily routine, and social comparison with people who are younger or fitter while social-environmental barriers included lack of activity partners and financial constraints (Kosteli et al.). Withall et al. (2011) noted that high cost, childcare responsibilities, and lack of self-efficacy limited older adults' participation in LTPA. Dare et al. have argued that failure to provide modified, viable facilities and programs was an

important constraint because older adults' needs for LTPA have become increasingly diverse. For instance, older adults have different levels of participation (i.e., regular vs. irregular) and have different preferred activities (e.g., dancing and gardening) (Dare et al.).

Leisure Facilitators

Despite a range of potential barriers, there is evidence that the rate of older adults' participation in LTPA has been increasing over the last few decades (e.g., Baker et al., 2009; Cardenas et al., 2009). To better understand this issue, recent studies (e.g., Mathews et al., 2020; Raynor et al., 2020) have examined not only constraints or barriers but enablers, the factors that encourage or promote LTPA participation among older adults. For example, Kirby and Kluge (2013) explored the experiences of a group of 65 and older women who learned to play volleyball for the first time at a university. Guided by the socioecological model, the authors found that enablers among these women included having teammates of similar age and skill level, encouragement and support from others, opportunity to be role models for peers and younger generations, free facilities, and supportive coaches. In another study, Dare et al. (2018) found that socializing with others was a salient enabler for older adults to engage in LTPA. In addition, Mathews et al. identified both similarities and differences in older adults' LTPA enablers across different races and ethnicities. For instance, although all groups mentioned health benefits as an enabler, American Indians were the most likely to consider health benefits important enablers.

In leisure sciences, facilitators (also called enablers in the physical activity literature) are factors that encourage leisure participation and fit with the constraint negotiation of leisure (Kim et al., 2011). Scholars have distinguished between motivation and facilitators. For example, Raymore (2002) noted that "a facilitator is an intrapersonal, interpersonal, or structural *condition*

that enables leisure participation, while motivation is the *process* in which that condition energizes or motivates behavior either facilitating or constraining leisure participation” (pp. 43-44). Similarly, then, constraint negotiation strategies (i.e., strategies to overcome constraints to participation; Hubbard & Mannell, 2001) are *process* variables as well. Following the condition vs. process conceptualization, Kim et al. often used the wording “*if*” to align with the “*condition*” in their leisure facilitators scale. One example is the item, “I would engage in leisure activities *if* [emphasis added] I have a chance for self-improvement.” On the other hand, when comparing the scale items between leisure facilitators and motivation in prior studies, some of the scale items were quite similar. For example, Hubbard and Mannell (2001) framed a motivation item as “I participate in leisure activities because it is good for my health.” In this case, the word “because” signals the motivator “good health.” In the facilitator scale items, Kim et al. indicated, “Good health is a factor that encourages me to engage in leisure activities.” These items demonstrate that good health can be a condition that enables leisure participation and a motivator that leads to leisure participation. These are subtle nuances that underscore the fact that motivation and facilitation are similar, complementary, and interrelated concepts. In the present study, we focused on facilitators that enable participation in order to focus on factors or conditions that can be addressed by leisure service providers to encourage participation.

In terms of conceptualization and measurement of facilitators, Raymore (2002) categorized leisure facilitators into three dimensions drawing upon Crawford et al.’s (1991) three dimensions of leisure constraints. Building on Raymore’s conceptual framework, Kim et al. (2011) constructed and validated a leisure facilitators scale. Subsequently, Kim and Heo (2015) applied the concept of leisure facilitators to develop a scale of tourism facilitators. To study sport/LTPA facilitators, the authors (under review) developed a LTPA/recreational sport

facilitators scale and tested it, demonstrating measurement invariance across several factors including key demographic factors. In this facilitators measure, which was used in the present investigation, each subscale includes parks and recreation-related items and facilitators found to be important to adults aged 50 and older (Choi et al., 2018; Kirby & Kluge, 2013; Wong et al., 2019). Findings from that paper supported a three-factor structure of intrapersonal, interpersonal, and structural facilitators. Intrapersonal facilitators refer to “individual characteristics, traits, and beliefs that would encourage leisure participation” (Raymore, 2002, p. 45). Some examples of intrapersonal facilitators include fun and enjoyment and one’s desire for specific within-person outcomes (e.g., to have good health).

Interpersonal facilitators, on the other hand, are “other people or social groups that enable or enhance leisure participation” (Raymore, 2002, p. 43). Specifically, friends, family, or social groups may play an important role in one’s participation in leisure (Raymore). According to the scale of leisure facilitators developed by Kim et al. (2011), interpersonal facilitators also include social aspects, such as the opportunity to make friends and being part of a group. The current authors have included similar items in their facilitator scale (under review). The current authors also added items specific to a sport context, including the opportunity to be part of a team, playing with similarly aged others, and showing others that older adults can play sports. Additionally, both Raymore and Kim et al. noted that authority figures or celebrities might serve as role models to encourage leisure participation. Meanwhile, it is worthwhile to note the bidirectional nature of these relationships; it is important to have role models, and it is important to be a role model to others (Wong et al., 2019). Both item types were therefore included in the present study.

Structural facilitators are defined as “social and physical institutions and organizations that operate external to individuals to enable or enhance leisure participation” (Raymore, 2002, p.47). Physical institutions include municipal parks and recreation agencies, and therefore it is important to include institution-level items when measuring facilitators. Some institution-level measures in Kim et al.’s (2011) study included easy access to facilities and media coverage. In the present study, the authors included institution-level items, such as access to quality coaches and instructors and safe facilities and fields. In Raymore's conceptualization of leisure facilitators, demographic factors, such as gender, ethnicity, socioeconomic status, and health, were included in the structural dimension. However, Raymore’s categorization of health as a structural facilitator was different from some constraints research in which health status has been regarded as an intrapersonal characteristic (Son et al., 2008a; Wilhelm-Stanis et al., 2010). In the present study, the research team conceptualized health status as an intrapersonal factor.

Models of Leisure Constraints and Constraint Negotiation

Although previous studies have examined the role of motivation in the constraint negotiation of LTPA and tested several models of the relationships between these constructs (e.g., Hubbard & Mannell, 2001; Son et al., 2008a, 2008b), they have not considered the role of facilitators in these models. The findings in Hubbard and Mannell’s (2001) study supported the constraints-effects-mitigation model in which negotiation was a mediator between constraints and motivation. This finding was different from that of Son et al. (2008a) who found support for a dual channel model in which constraints and negotiation had independent and opposite effects on LTPA, and negotiation served as a mediator of the relationships of constraints and motivation.

A few leisure researchers have proposed that it may be better to conceptualize and examine constraints and/or constraint negotiation using formative models rather than reflective

models (Kono et al., 2018; Kono et al., 2020; Kyle & Jun, 2015). In a formative model, the indicators cause rather than reflect the construct of interest, and there is no expectation of inter-item correlations. Kyle and Jun (2015) indicated initial support for a formative model of constraints in one sample. Kono et al. (2018) noted that there were significant limitations to Kyle and Jun's findings, including the lack of direct comparison between reflective and formative models within the statistical analyses conducted. Kono et al. used a different procedure (confirmatory tetrad analysis in partial least squares) to examine models of constraints with two datasets, rejecting the reflective models in most comparisons. In contrast, a similar investigation of negotiation by Kono et al. (2020) found majority support for a reflective model instead of a formative model. Collectively, these findings underscore the complexity in conceptualizing and analyzing constraint and negotiation. Kono et al.'s (2018, 2020) findings indicate that, although the formative method might be preferable for some multidimensional constructs in some study samples, it is not so for others. Moreover, there are times it is more appropriate to analyze some or all these factors as unidimensional constructs with no underlying latent structure (i.e., observed variables). For instance, some scholars have treated constraints (i.e., barriers) as independent items while at other times as a unidimensional, observed measure (Booth et al., 2002; Cerin et al., 2010; Moschny et al., 2011). Superseding analytical considerations are conceptual and/or theoretical arguments regarding whether dimensions cause or reflect the constructs of interest (Rönkkö et al., 2016).

Kono et al. (2018) levied a critique of the work of Hubbard and Mannell (2001) and Son et al. (2008a) regarding structural equation modeling techniques that is relevant to the current study. This critique included the use of parcels (i.e., subscales), mean scores, item or parameter drop, and model respecifications, such as correlating error terms. Little et al. (2014) have

strongly advocated to end the debate on parceling. They note that, like any analytical approach, there are both advantages and disadvantages to the use of parceling. Counter to Kono et al.'s critique of mean scores, Little et al. recommend mean scores as the preferable approach, particularly for parcels when items are on the same scale. Kono et al. also critiqued the use of respecified models, an approach used by Son et al. and Wilhelm Stanis et al. (2009). Several authors have noted, however, that respecification of models is an acceptable practice when respecifications are not dictated by fit and modification indices alone but are instead based on theoretical and/or conceptual grounds (Byrne, 2016; Kline, 2015). Further, Hallquist (2017) has emphasized that SEMs are often imperfect in the *a priori* specification, and that good, open science practices would indicate researchers should clearly state why the respecification is theoretically plausible and defensible and be transparent in the *a priori* model versus *post hoc* modifications. Moreover, Bocell (2015) found that *not* allowing error covariances created biased parameter estimates in Monte Carlo simulations, concluding that failing to do model respecification may result in inaccurate estimates. Although common in the 2000s, item or parameter drop (i.e., trimming) has fallen out of favor because deleting nonsignificant paths capitalizes on chance study-sample findings (Goodboy & Kline, 2017).

As analytical techniques are continually evolving and improving (Tarka, 2018), best practices are as well. The technique used by Kono et al., PLS-SEM, also has challenges in the way it has been applied and there remains a lack of consensus on best practices when using it (Richter et al., 2016; Rönkkö et al., 2016). Hence, it is important to apply contemporary best practices to one's analytical approach that balances theoretical and empirical considerations (Hallquist, 2017).

Study Purpose and Hypotheses

Facilitators are potentially an important addition to constraint and negotiation models to advance our understanding of relationships between these factors, particularly how they might relate to LTPA behavior and promoting active leisure lifestyles in later life. There is a need to identify practical and professional implications related to encouraging older adult LTPA, and facilitators might contribute to these implications (Kim et al., 2011). Given the dearth of research on facilitators, the purpose of the present study was to empirically examine the role of facilitators in the constraint negotiation of LTPA, while controlling demographic factors of age, gender, education, retirement status, physical health, and sport participation status. There were five hypotheses which are displayed in **Figure 1**.

H1: Facilitators will relate to constraints.

Related to H1, Kocak (2017) found a negative relationship between constraints and facilitators but Kim et al. (2011) found a positive relationship between constraints and facilitators. Due to the mixed results, we proposed a nondirectional hypothesis for this relationship.

H2: Facilitators will positively relate to negotiation strategies.

Based on the research of Kocak (2017), we hypothesized a positive relationship between facilitators and negotiation strategies.

H3: Facilitators will positively relate to LTPA.

Based on qualitative (Choi et al., 2018; Kirby & Kluge, 2013; Naar et al., 2017; Wong et al., 2019) and quantitative (Kocak, 2017) findings, we hypothesized that facilitators will have a positive relationship with LTPA.

H4: Negotiation strategies will mediate the Facilitator-LTPA relationship through enhancement (+).

Based on previous research (e.g., Hubbard & Mannell, 2001; Son et al., 2008a), we expected negotiation strategies to have a positive relationship with LTPA. Based on H2, we also expected negotiation strategies at least to partially mediate the relationship between facilitators and LTPA in a positive direction.

H5: Constraints will mediate the Facilitator-LTPA relationship through attenuation (-).

Based on previous research (Hubbard & Mannell; Son et al.), we expected constraints to have a negative relationship with LTPA. Based on H1, we also expected constraints at least to partially mediate the relationship between facilitators and LTPA by attenuating the positive effect of facilitators on LTPA.

Method

Participants and Sampling

Participants were recruited through a third-party survey company which sent email invitations to members of a national survey pool of individuals aged 50 and older asking them to complete an online questionnaire. The survey pool consisted of people in the United States who have opted to complete online surveys for a small incentive and have previously been validated using third-party sources. The survey was about sport behaviors of adults aged 50 and older and received IRB approval.

The survey was completed by 1,207 middle-aged and older adults ($M = 63.38$; $SD = 8.26$; Range = 50 to 91). The sample included 651 (54%) women and 552 (46%) men and slightly more than half (55%) were married. Just less than half (48%) were retired with the rest working full time (22%), working part-time or self-employed (14%), not working due to permanent or temporary disability (10%), working in the home (5%), or unemployed (3%). Most respondents were white (87%), with smaller percentages identifying as Black or African American (7%),

Asian or Asian American (3%), and Hispanic or Latino (2%). Participants reported a range of education levels with 39% with four years of college or more.

Instruments

This study included measures of facilitators, constraints, negotiation, LTPA participation, and covariates (age, gender, education, retirement status, self-reported health, and sport participation).

LTPA Facilitators

The research team used their qualitative research (e.g., Choi et al., 2018; Wong et al., 2019), Kirby and Kluge (2013), and Kim et al. (2011) to develop 30 LTPA/sport facilitator items. The scale provides a departure from Kim et al. in that it is specific to LTPA/sports instead of general leisure, includes items relevant to adults aged 50 and older (e.g., modified rules to prevent injury, modified for one's age group) and municipal agencies (e.g., being personally invited by a parks and recreation or community/senior center staff member), and has notably different instructions, item topics, and item formats. The scale included six intrapersonal facilitator items ("To be active," "To have fun," "Living life to the fullest"), 13 interpersonal facilitator items ("Having role models my age," "Opportunity to make friends"), and 11 structural facilitator items ("Access to necessary facilities or fields," "Credibility of park and recreation organizations"). The research team investigated the psychometric properties of the scale and found support for its three-factor structure and reliability, with subscale alpha values of .94 (intra-), .96 (inter-), and .97 (structural) and a total scale reliability of .98 (under review).

LTPA Constraints

The researchers used 14 items, 9 of which were modified items from Hubbard and Mannell's (2001) 32-item constraints scale to reference recreational PA/sport. The scale included

intrapersonal, interpersonal, and structural constraints items. Example of items: “The facilities and/or fields aren’t convenient,” “I am not in good enough shape to participate,” and “I don’t have family, friends and/or acquaintances with whom to participate.” Based on our qualitative study findings (e.g., Liechty et al., 2016; Naar et al., 2017), the research team also included five items including age-related constraints, “I don’t have people my age with whom to play” and “I don’t know what sport activities are available for my age,” and the three items “I am in poor health,” “I don’t like to sweat,” and “I’m afraid of getting hurt.” The 14-item constraints scale had an alpha value of .92.

LTPA Negotiation Strategies

The researchers used 17 items, 15 of which were original or modified items from Hubbard and Mannell’s (2001) 35-item constraint negotiation scale to reference recreational PA/sport, including “I have learned to participate despite an injury or physical/health conditions.” Based on our qualitative research (e.g., Choi et al., 2018; Wong et al., 2019), the research team included an item on age-related negotiation, “I participate with people my age,” and an item on municipal parks and recreation negotiation, “I go to my local Parks and Recreation Department to find out what is available.” The 17-item constraint negotiation scale had an alpha value of .95.

Leisure-Time Physical Activity (LTPA)/Recreational Sport

Respondents completed the Physical Activity Scale for the Elderly (New England Research Institutes, Inc., 1991). The scale assesses leisure-time physical activity (LTPA) and recreational sport over the past seven days including light, moderate, strenuous, and muscle strength activities. Scores were computed according to the scoring protocol, resulting in a weighted sum score for LTPA across frequency, duration and intensity (for more detail on the

scoring protocol, see Son et al., 2008a). The scale has been shown to have acceptable test-retest reliability ($r = .75$) and validity (Washburn et al., 1993; Washburn et al., 1999).

Sociodemographic and Other Covariates

The study also included several items used as covariates in the analysis. These included age in years, gender (0 = male, 1 = female), educational attainment (12 education categories from “No school/Some School” to “Ph.D., M.D., J.D., or Other Professional Degree”), retirement status (0 = not retired, 1 = retired), self-reported health (“In general, would you say your physical health is excellent, very good, good, fair, or poor?”; Ferraro & Wilkinson, 2015), and sport participation (“Have you played sports in the past year?,” 0 = no, 1 = yes).

Analysis Plan

SPSS/Amos 25.0 was used for all analyses. As a result of the nonnormal distribution of LTPA, which is a common occurrence for LTPA behavior with some respondents having no participation and a small proportion of respondents having very high levels of LTPA (Son et al., 2008), we transformed the overall measure of LTPA using a square root transformation. Subsequent multiple regression model diagnostics on the transformed dependent variable indicated that the standardized residuals conformed to ordinary least-squares assumptions and there was no multicollinearity between study variables (Durbin-Watson = 1.96, VIFs ranged from 1.07 to 1.68). The present authors took a reflective modeling approach to analyzing the relationships between constructs, which is a common approach in constraint negotiation research (Hubbard & Mannell, 2001; Kim et al., 2019; Son et al., 2008a, 2008b; Stensland et al., 2017; Wilhelm Stanis et al., 2010). Exploratory and confirmatory factor analysis indicated a multidimensional three-factor structure for facilitators with good model fit (under review). As noted in the **Instruments** section, we used item subsets from Hubbard and Mannell’s (2001)

constraint scale (9 of 32 items) and negotiation scales (15 of 35 items) and developed some items based on previous research (e.g., Choi et al., 2018). Exploratory factor analysis using Varimax rotation (orthogonal; uncorrelated factors) on the reduced scales resulted in counter-theoretical factor structures (e.g., two factors for constraints) in combination with counter-theoretical item loadings within factors (e.g., intrapersonal and structural items loading on the same factor with no clear conceptual basis in the literature). Similarly, a follow up analysis using Direct Oblimin (oblique rotation) produced equally counter-theoretical structures and loadings. When constraining the factors to one (i.e., unidimensional), item factor loadings supported single observed factors for these two measures with loadings ranging from .57 to .75 for constraints and .45 to .86 for negotiation ($\geq .32$; Tabachnick & Fidell, 2019). The high reliability values for the constraints and negotiation sum scales ($> .90$ s) provided additional support for treating these variables as observed variables in the analysis. Based on path analysis findings, facilitators were treated as a three-factor latent variable and constraint and negotiation were treated as single dimension observed variables along with LTPA. We proceeded to test the model using Graham et al.'s (2003) procedures for regression path analysis using full information maximum likelihood (FIML) estimation of missing data and including key demographic and other factors as control variables. This procedure allows for accurate estimation of missing data, control of measurement error for more accurate parameter estimates, and investigation of relationships between latent and observed variables within the path model (Graham et al.). Respecifications of the path model were based on theory and/or conceptual expectations (Byrne, 2016; Kline, 2015).

There are several measures to examine model fit. One measure is the ratio of chi-square to degrees of freedom with ratios of three or less recommended (Carmines & McIver, 1981) with ratios of five or less recommended more recently (Schumacker & Lomax, 2010). Other model fit

measures include the incremental fit indices NFI (Normed Fit Index), RFI (Relative Fit Index), IFI (Incremental Fit Index), TLI (Tucker Lewis Index), and CFI (Comparative Fit Index) as well as the absolute fit index RMSEA (Root Mean Square Error of Approximation). Incremental fit indices above .90 (e.g., CFI) and a RMSEA absolute fit index below .08 or .10 indicate acceptable fit (Hu & Bentler, 1999; Marsh et al., 2004). Incremental fit indices $\geq .95$ and RMSEA $\leq .05$ indicate a close fit (Hu & Bentler).

Results

Table 1 provides the correlation matrix for the study variables. Correlation analysis indicated significant relationships between all of the variables except facilitators and constraints. LTPA effect sizes ranged, with small effect sizes for age ($r = -.15$), gender ($r = -.18$), education ($r = .11$), and retirement status ($r = -.12$), medium effect sizes for facilitators ($r = .30$), constraints ($r = -.29$), health ($r = .32$), and sport participation ($r = .36$), and a high medium effect size for negotiation ($r = .47$; large $\geq .50$).

Table 2 provides the fit statistics for the initial and respecified models. Overall, the initial model had mixed goodness of fit (GOF) results with $\chi^2/df = 7.41$, NFI = .97, RFI = .87, IFI = .97, TLI = .88, CFI = .97, RMSEA = .07. We respecified the measurement model based on conceptual expectations that physical health and sport participation would share error covariance with intrapersonal sport facilitators based on the items and item wording in the subscale. More specifically, the intrapersonal facilitator “having good health” is conceptually similar to the self-reported health item and the intrapersonal sport facilitator “to be active” is conceptually related to sport participation in the past year. The respecified model with the two correlated residuals of physical health and sport participation to intrapersonal facilitators yielded a good fit: $\chi^2/df = 4.25$,

NFI = .98, RFI = .92, IFI = .99, TLI = .94, CFI = .99, RMSEA = .05. The respecified regression path model with regression weights and R^2 values is provided in **Figure 2**.

The respecified model explained 34% of the variance in LTPA. Negotiation was the strongest predictor of LTPA ($\beta = .37$), followed by health ($\beta = .16$), sport participation ($\beta = .13$), constraints ($\beta = -.12$), gender ($\beta = -.10$), and age ($\beta = -.09$). In this model, facilitators were fully mediated by constraints and negotiation with $\beta = .00$ and an indirect effect of $\beta = .21$. Follow up Sobel tests indicated that the indirect effect was significant for both constraints ($-3.12, p < .01$) and negotiation ($8.59, p < .001$). The model also explained 53% of the variance in negotiation. Facilitators were the strongest predictor of negotiation ($\beta = .62$) followed by sport participation ($\beta = .21$), gender ($\beta = -.09$), and health ($\beta = .07$). Health ($\beta = -.33$), sports participation ($\beta = -.27$), facilitators ($\beta = .13$), and gender ($\beta = .11$) explained 24% of the variance in constraints. Constraints were not related to negotiation ($\beta = -.03, p = .29$).

Regarding the reflective treatment of facilitators, in addition to the model fit, the model factor loadings were “good” for intrapersonal facilitators ($\lambda = .62$, 45% variance explained by the latent factor) and “excellent” for interpersonal facilitators ($\lambda = .92$; 85% variance explained) and structural facilitators ($\lambda = .88$; 78% variance explained) (Tabachnick & Fidell, 2019). Reliability coefficients were also supportive of a reflective conceptualization of facilitators with the respective subscales at .94, .96, and .97, well-above customary cutoffs of .60 or .70.

Discussion

Preliminary Support for Facilitators in the Constraint Negotiation of LTPA

This study is one of the first studies to our knowledge to empirically investigate the role of facilitators in models of constraints, negotiation strategies, and LTPA. As part of scale testing, Kim et al. (2011) investigated facilitators on constraints and negotiation strategies but not on a

leisure-related dependent variable. Facilitators were not significantly related to constraints in the bivariate analysis (cf. Kim et al.; Kocak, 2017), however, this relationship was significant when controlling for other variables (**H1 supported**). The positive relationship between facilitators and constraints might be explained by previous research indicating that constraints can have a triggering effect on other factors such as negotiation strategies (Hubbard and Mannell, 2001). Another possible reason for this positive relationship is that facilitators may heighten awareness of constraints as individuals cognitively weigh the balance of facilitators and constraints to LTPA. As expected, there was also a significant positive relationship between facilitators and negotiation (**H2 supported**) (Kocak). Although Hubbard and Mannell indicated that some of the negotiation strategies in their scale could be considered facilitators, the current research team carefully examined their scale and developed the facilitator items to be distinct from their negotiation items. The absence of multicollinearity between facilitators and negotiation in the present study supports the conclusion that these are separate, interrelated constructs and not the same construct.

The emergence of a relationship between facilitators and constraints (**H1**) in the multivariate analysis with sociodemographic factors suggests that there were suppressor effects within the model such that the suppression of irrelevant variance between other variables in the model significantly increased the regression weight of another variable in the model (Son & Janke, 2015) - in this case, the facilitators-constraints path. This finding underscores the importance of investigating relationships between social cognitive factors such as facilitators and constraints because it is likely they influence each other and the relationships with leisure-related dependent variables (Mannell & Loucks-Atkinson, 2005; Son et al., 2008a; Son & Janke). Likewise, it is useful to include demographic and other factors (i.e., self-perceived health, sport

participation) expected to relate to LTPA to control for their possible effects and provide more confidence that one's model represents the sample accurately (Son et al., 2008b; Wilhelm Stanis, 2010). For instance, the path model *without* the demographic and other covariates indicated a nonsignificant path between facilitators and constraints ($p = .42$) and a significant path between constraints and negotiation ($p < .001$). In contrast, these relationships were the opposite in the model when controlling for covariates – there was a significant path between facilitators and constraints ($p < .001$) and a nonsignificant path between constraints and negotiation ($p = .14$). Overall, the model without covariates had marginally adequate absolute fit (e.g., RMSEA = .10) and a high χ^2/df of 13.56 (> 5.00). This model would lead to a different conclusion about the relationships between the primary constructs of interest. The covariates model improved the GOF statistics with and without respecifications. Although correlating error terms based on modification indices alone and therefore without a theoretical or conceptual basis should not be undertaken, doing so based on conceptual grounds is an acceptable practice (Hallquist, 2017; Byrne, 2016; Kline, 2015) and may decrease the risk of biased parameters (Bocell, 2015). In this study, we allowed the error terms of the within-person control variables of self-reported health and sport participation to covary with conceptually similar within-person (i.e., intrapersonal) facilitators which included similar items such as “having good health” and “to be active,” thereby upholding best practices on the use of error covariances in SEM. The comparative findings with and without covariates supported controlling for these error terms in the model. Of note, negotiation was a mediator of the facilitator-LTPA relationship in both the models with and without covariates but constraint was only a mediator in the covariates model.

In bivariate analyses, negotiation had the largest effect size on LTPA, bordering on a large effect (.47). There also was a significant positive relationship between facilitators and

LTPA (**support for H3**). The facilitator effect was almost exactly equal to and counter to the effect of constraints (.295 vs. -.291, respectively). In the path model, constraints and negotiation had independent counter effects on LTPA, a finding that mirrors previous research with older adults (Son et al., 2008a, 2008b). Unlike Son et al., in this sample, negotiation was a stronger predictor of LTPA than constraints with three times the beta weight. In terms of the addition of facilitators in the examination of the constraint negotiation process of LTPA, the findings of this study indicate that facilitators were fully mediated by constraints and negotiation (**support for H4 and H5**). These findings suggest that the relationship between facilitators and LTPA can be explained by the intermediary factors, constraint and negotiation. To our knowledge, this study is the first to investigate these variables in a path model to determine their relationships. The good fit of the model provides support for investigating facilitators alongside constraint and negotiation and the utility of facilitators in understanding LTPA behavior. Three incremental fit indices were above .95, two were above .90, and the absolute fit RMSEA was .05 (close fit \leq .05). The good fit of the model with few modifications (two error covariances), the strength of the factor loadings, and the reliability coefficients provided initial support for a reflective latent variable approach to conceptualizing facilitators (cf. constraint negotiation, Kono et al., 2020). In contrast to facilitators, factor analyses of constraint and negotiation indicated they should be treated as unidimensional observed variables in the model. The latter findings are in line with some physical activity research on barriers (Booth et al., 2002; Cerin et al., 2010). The statistical approach taken was evidence-based and followed recommendations for the examination of latent and observed constructs using path analysis in structural equation modeling (Graham et al., 2003). The study findings provide preliminary evidence of the role of facilitators in the constraint negotiation of LTPA. Future research may want to compare formative and reflective

models and/or conduct mixed models to examine these relationships, however, such analyses are beyond the purpose and scope of the present study.

Implications for Practice: Facilitating Older Adult LTPA

From a practitioner standpoint, facilitators can play an important role in promoting healthy active lifestyles (Choi et al., 2018; Kirby & Kluge, 2013; Liechty et al., 2016; Naar et al., 2017; Wong et al., 2019). As noted above, the results indicate that facilitators were positively related to negotiation (both bivariate and multivariate analyses) and LTPA (bivariate analysis) (**H2 and H3, respectively**). Facilitators were the strongest predictor of negotiation (**H2**). Negotiation, in turn, was the strongest predictor of LTPA as well as the stronger mediator of the facilitator-LTPA relationship (**H4**). These findings taken together underscore the importance of addressing both facilitators and negotiation strategies in community contexts. It is important for community service providers, such as park and recreation professionals, to continue their work to facilitate LTPA in a variety of ways, including the provision of sports opportunities for older adults, informational fliers, and personal invitations to potential participants (i.e., facilitators). There is also a need to assist people in identifying and using negotiation strategies - the self-regulatory strategies a person uses to participate despite the constraints (Hubbard & Mannell, 2001; Son et al., 2009). One interesting finding in the present study was that negotiation strategies had three times as large an effect ($\beta = .37$) as constraints ($\beta = -.12$) on LTPA. It might be particularly helpful for practitioners to have a participation plan that includes both facilitators and negotiation strategies and then to “match” key facilitators and negotiation strategies. For instance, a recreation program coordinator could identify the availability of field space and/or pickleball courts as a key facilitator for older adult sports participation, and then “match” this facilitator with the negotiation strategy of “knowing what fields and courts are available.” A

related step after matching facilitators and negotiation strategies might be identifying what days and times older adults are most interested in gaining access to field space and courts. Another program-based approach would be to hold a workshop with older adults that includes information on parks and recreation-specific facilitators and a discussion of related negotiation strategies. Moreover, negotiation strategies that are highly ranked by participants and potential participants can be used to develop facilitation-based practices within parks and recreation departments (i.e., policy development). Using the current study items as examples, the negotiation items “I try to find people with whom to participate” and “I participate with people my age” can be tailored into the facilitator-based objective, “Provide sport-related older adult social opportunities.” Similarly, “I borrow equipment and/or clothes” can be written into a parks and recreation plan as the objective, “Provide equipment for sports that older adults enjoy playing, such as pickleball racquets and balls.”

Study Limitations

There are several study limitations. Although participants in the study came from a large national U.S. sample with ten or more respondents from 34 states, it was not a random sample. Another related limitation was that this study only included individuals aged 50 and older so it is not clear if these relationships would be the same in a sample that includes adults aged 18 to 49. The study variables were also developed in relation to recreational sport so it is unclear if these results would remain if examining other leisure activities (e.g., social leisure) or specific sport contexts (e.g., marathons). From a theoretical standpoint, another limitation of the current study was that there was no measure of motivation. This decision was based on the research team’s desire to limit participant burden in a self-directed online survey of older respondents while answering the primary research questions pertaining to the possible relationships of facilitators to

constraint, negotiation, and LTPA. There is a need for further research to examine the relationships between motivation and other social cognitive factors of LTPA. As an additional way to limit participant burden, we used a subset of items from Hubbard and Mannell (2001) for both constraint and negotiation. It is possible that the use of the full scales would have led to different results. One additional limitation of the current study is the lack of an item measuring income. Income might influence these relationships.

Conclusion

This study provides preliminary evidence that facilitators are significantly related to LTPA, with a good fitting model of the study variables when controlling for key demographic factors. Moreover, the findings indicate that the relationship between facilitators and LTPA is fully mediated by constraints and negotiation strategies, with negotiation being the strongest mediator. Facilitators had the strongest relationship with negotiation strategies and, in turn, negotiation strategies had the strongest relationship with LTPA behavior. These findings provide support for investigating the interrelationships between facilitators and negotiation. Additionally, these findings support developing practical approaches to enhancing facilitators and “matching” facilitators with negotiation strategies at the parks and recreation policy/procedural level. More research is needed to investigate these findings further, particularly in younger adults and with other leisure behaviors, but this study provides initial support for including facilitators in constraint negotiation models. Empirical research on facilitators provides insights and direction to the profession to identify facilitators that encourage people to participate in LTPA, as well as information that can be used to develop facilitator enhancing policies and practices that promote LTPA in community populations. Our intent in this study was to begin the examination process

of facilitators in the constraint negotiation of LTPA to provide preliminary empirical evidence for scientists and practitioners alike.

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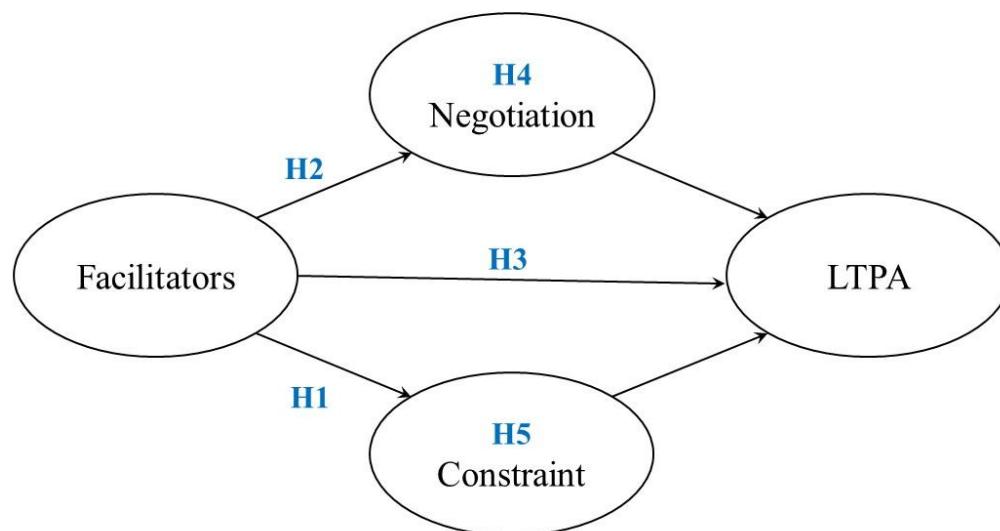
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Figure 1

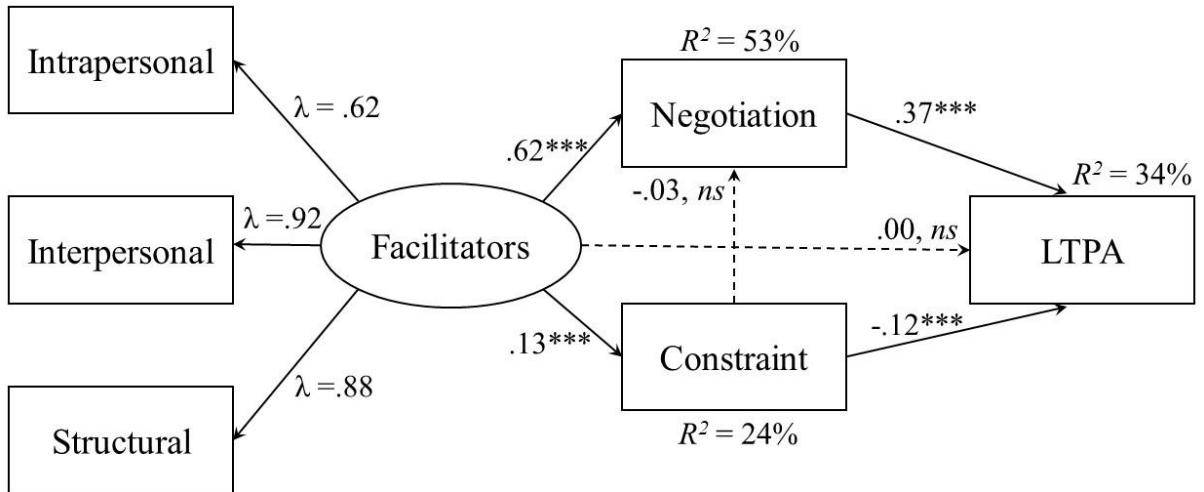
Hypothesized Model of Facilitators, Mediators, and LTPA Relationships



Notes. Covariates (i.e., control variables) are not displayed. Negotiation (H4) and constraint (H5) are hypothesized as mediators of the facilitators-LTPA relationship.

Figure 2

Path Model with Facilitators, Constraints, and Negotiation to LTPA



Notes. All path values are beta weights (β). $^{*}p \leq .05$, $^{**}p \leq .01$, $^{***}p \leq .001$. Covariates (i.e., control variables) are not displayed.

Table 1*Correlation Matrix*

Variable	1	2	3	4	5	6	7	8	9	10
Age (1)	1									
Gender (2)	-.01	1								
Education (3)	.00	-.18***	1							
Self-Reported Health (4)	-.01	-.07*	.17***	1						
Sport Participation (5)	-.11***	-.12***	.13***	.23***	1					
Retirement Status (6)	.61***	.00	-.05	-.02	-.08*	1				
Constraints (7)	.01	.18***	-.09***	-.39***	-.32***	.01	1			
Facilitators (8)	-.07*	.10***	.09**	.14***	.24***	-.06*	.00	1		
Negotiation (9)	-.09**	-.09**	.10***	.20***	.36***	-.09**	-.15***	.60***	1	
LTPA (10)	-.15***	-.18***	.11***	.32***	.36***	-.12***	-.29***	.30***	.47***	1

Note. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$ (two-tailed significance tests).

Table 2*Comparative Summary of Fit Indices for the Initial and Respecified Models*

Model	χ^2/df	NFI	RFI	IFI	TLI	CFI	RMSEA
Initial Model	7.41	0.97	0.87	0.97	0.88	0.97	0.07
Respecified Model	4.25	0.98	0.92	0.99	0.94	0.99	0.05

Note. In the respecified model, there were error covariances between intrapersonal facilitators and two person-centered covariates, self-reported health and sport participation.