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Get Serious

Gender and Constraints to Long-Distance Running

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Abstract

While there has been tremendous growth in participation rates of women in distance running, the percentage of women participating in full marathons has plateaued. This study investigated this phenomenon by exploring whether differences in constraints and constraint negotiation across gender within this serious leisure activity can explain this difference. Survey research was used to collect data from 3,453 marathon and half-marathon finishers. Comparisons found different barriers across both gender and distance. Additional findings suggest, however, that constraints associated with women in leisure in general do not adequately explain the participation differences, and that women may merely define the parameters of serious leisure within distance running differently than men.

Keywords: *constraints; negotiation-efficacy; gender; serious leisure; distance running*

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Distance running has experienced a significant increase in popularity in the past 25 years, reflected by a nearly 300% increase in the number of road race finishers since 1990 (Running USA, 2014). Running USA's (2014) annual survey shows that not only are more people finishing, but more people are participating in races more frequently, in greater distances, and with faster times. This growth is an example of an increase in recreation specialization, the exclusive participation in a single form of leisure (Bryan, 1977), which through increased involvement, can become a serious leisure pursuit (Stebbins, 1982; 2001). The challenge associated with these activities allows individuals to become highly and exclusively involved, both in attitudes and behavior (Scott & Shafer, 2001; Stebbins, 2001). As an activity that requires time commitments for training, is challenging in nature, and allows individuals to progress to greater levels of involvement, distance running now fits the definition for many as a specialized, serious form of leisure.

This change in popularity for the activity is driven, in part, by the percentage of female participants, which has gone from 25% in 1990 to 57% overall in 2013. This influx of women into the once predominantly male activity is most significantly felt in the half marathon distance (13.1 miles), where women make up 61% of all race finishers (Running USA, 2014). These numbers would suggest that women have carved out a space for themselves within distance running, and the activity has in some ways become gender neutral. However, while the percentage of female runners at every distance up to and including the half marathon has increased continually over the past 10 years, the percentage of women participating in full marathons has plateaued since 2006, with women still representing the minority in this distance at 43% (Running USA, 2014). Ultra running races, which are defined as distance running events longer than 26.2 miles, have an even greater gender disparity, comprised of only 27% female runners (Krouse, Ransdell, Lucas, & Pritchard, 2011). This participation difference in events at 26.2 miles and longer compared to all other distances suggests that something may still be fundamentally different in the serious leisure experience for men and women in distance running.

The serious leisure literature has suggested that gender itself can be a constraint to participation in serious leisure activities (Stebbins, 1992). According to Stebbins, gender "acts as a sort of sieve, filtering out males and females from activities culturally defined as appropriate for one sex only" (p. 73). This filtering effect, however, appears to no longer hold as a barrier in the context of distance running, at least in the initial stages of participation. The leisure constraint literature suggests that women may face constraints at every level of leisure participation, and therefore, the framework may be a way to understand the differences in participation that is unique to the full marathon distance. The environmental filter that once precluded women from distance running has appeared to shift, moving the exclusionary barriers, and now seems to apply only to the longest race distances of 26.2 miles and beyond.

Constraints to general leisure associated with gender have been well studied. These include a lowered sense of entitlement to leisure for women as they often are the traditional primary caregivers in the household (Maume, 2008), and lack of interpersonal support to pursue more time consuming levels of leisure (Henderson & Allen, 1991). Structural constraints, while often similar to those faced by men, can have antecedents related specifically to being female, including social norms that both prescribe particular forms of leisure for women and suggest a sacrificing leisure in favor of family commitments (Shaw, 1994). In terms of constraint negotiation, the literature has moved away from strict identification of constraints and strategies for overcoming them to an examination of the psychosocial attitudes that can facilitate constraint negotiation (Loucks-Atkinson & Mannell, 2007; Ridinger, Funk, Jordan, & Kaplanidou, 2012; White, 2008). Negotiation-efficacy, the belief in one's ability to overcome barriers to participation, has been

shown to both increase efforts to overcome barriers (Loucks-Atkinson & Mannell, 2007; White, 2008) and increase commitment to an activity (Ridinger et al., 2012). It has also been suggested that family and spousal support can act as an agent of constraint negotiation, facilitating greater levels of participation (Goodsell & Harris, 2011).

Participation numbers for long-distance running over the past 20 years provide support for the assertion that constraints to participation for women do not inevitably prevent them from engaging in this form of active leisure, and it is possible to “negotiate” through perceived barriers to participation (Jackson, Crawford & Godbey, 1993; Loucks-Atkinson & Mannell, 2007; White, 2008). Ridinger et al. (2012) found that female marathon runners had higher levels of negotiation-efficacy for running than their male counterparts, and suggested that this difference might originate in the necessity for women to overcome more constraints to participate in the same distance as their male counterparts. For example, the additional time needed to train for a full marathon might force more women to sacrifice this time in favor of family obligations. However, these authors were limited by not including specific questions about family structure and support on their survey and suggested that “further research is needed before meaningful conclusions can be made” (p. 172). The question remains whether constraints faced by women in some way become more salient for participation in a full marathon versus other distances.

The purpose of this study was to explore differences in constraints and constraint negotiation for women and men at two different forms of participation within the same serious leisure activity, distance running. Specifically, we used the constraint literature and constraint negotiation framework to explore why the rate of female participants in half marathon events has continued to increase over the years while the rate of women participating in full marathon events has remained stagnant. This could provide insight on factors that impact participation in different levels of the same form of serious leisure, and how this may be informed by gender.

Review of Literature

Serious Leisure

As individuals in modern times become able to complete tasks more efficiently in both their occupational and basic life sustaining roles, there is a shift from more passive, casual forms of activity during leisure time to options that offer challenges for individuals for whom other life domains have become less fulfilling. This quest for more challenging activities has been identified as serious leisure (Stebbins, 1992; 2001), defined as “the steady pursuit of an amateur, hobby, or career volunteer activity that captivates its participants with its complexity and many challenges” (Stebbins, 2001, p. 54). Individuals follow a path that leads them through a progression in which they learn the activity, establish themselves in the activity, and maintain a consistent level of engagement (Stebbins, 1992). The pursuit leads to greater skill and knowledge, but also requires greater amounts of engagement, and monetary as well as temporal investment. Therefore, many of the same barriers facing those participating in casual forms of leisure apply even more saliently to serious leisure, particularly as individuals progress into greater levels of engagement with a particular activity (Scott & Schafer, 2001). While barriers to initial participation have clearly been overcome, the increasing physical and psychological resources necessary to become “seriously” involved in an activity cause many of the same constraints to preclude greater levels of participation, including gender (Stebbins, 1992).

There has been some empirical work that explored the ways in which gender acts like a “sieve,” and the ways in which women negotiate through constraints to form particular leisure

identities that are in some way considered gendered by social norms, either gender deviant (Dilley & Scraton, 2010) or gender congruent (Scraton, 2006). Similar to what Rainsborough (2006) found in the case of women in the Sea Cadet Corps, another form of serious leisure, distance running has become a space where women established identities that were initially resistant to normative gender relations, and over time, become the norm. They have, as Wheaton and Tomlinson (1998, p. 265) suggest, pushed gender into a "passive identity," which is reflected by the vast increase in women's participation over the past 20 years (Running USA, 2013).

As women gain greater access to serious leisure, recent work also highlights the ways in which serious leisure can become a source of resistance of gendered relations for women, a space where women can carve out their own unique identities outside of their gendered lives (Dilley & Scraton, 2010). For example, Stalp (2006) found that women engaged in quilting as a form of serious leisure negotiated their time and space, essentially transforming their serious leisure into a form of resistance from norms, despite engaging in a traditionally feminine activity. The increased participation of women in distance running over the past 20 years is possibly reflective of such a form of resistance, as women have claimed a space for themselves in it.

Yet, if the space were complete, one would expect to see similar numbers across all manifestations within the same form of serious leisure. However, the percentage of women participating in full marathons has remained the same while the percentage of female runners in half marathons continues to grow. Thus, gender may still act as a constraint in particular manifestations of serious leisure (Stebbins, 1992). The ways in which constraints affect men and women's involvement in serious leisure differently in various manifestations of the same activity have not been extensively explored. Mostly qualitative work highlights the female experience of negotiating through familial constraints, typically feminine commitments of family to engage in acts of resistance (Stalp, 2006). Dilley and Scraton (2010) found that family commitments of serious female climbers led to various negotiation strategies, including overlapping personal leisure with family leisure, or the abandonment of the leisure activity all together during the early years of child rearing. Outside of the negotiation of structural constraints, there has been little attempt to understand how external gender norms may inform behavior, as suggested by Rainsborough (2006), "...it is not clear how gendered relations, once conceptualized as effectively constraining women's leisure, still operate and whether they impact on women's use of leisure and the meanings they give to their participation." (p. 258)

In an exception, Goodsell and Harris (2011) interviewed both men and women long-distance runners in an attempt to understand differences in constraints and negotiation in the activity. They found that following childbirth, women long-distance runners sometimes viewed the worlds of running and family as irreconcilable with each other and were forced to make decisions that affected their leisure activities, while this was less true of men. Although both men and women marathoners found it difficult to balance family and their serious leisure, women's constraints came from an inherent gendered obligation, consistent with the general constraint literature. As a qualitative study, it highlighted that women must grapple with more constraints to participate in a particular activity. However, as the authors only interviewed individuals who participated at the marathon level, they were not able to suggest how these differences can actually inform participation at different race distances. Overall, the research does not answer questions about whether the way in which men and women experience constraints differently can result in different manifestations of behavior within the same kind of activity—whether we have seen social gender norms removed as a constraint, or whether the overall constraints that

once prevented initial levels of participation have simply shifted to change preferences within the activity.

Constraints and Gender

Research exploring constraints that inform participation has been founded largely upon a single theoretical framework. Crawford and Godbey (1987) outlined a model for understanding the three main areas of constraints to leisure: *structural constraints*, intervening barriers to participation, such as time and money, facilities; *interpersonal constraints*, which result from relationships between or among individuals; and *intrapersonal constraints*, which alter leisure preferences rather than interfering between preferences and actual participation. The intrapersonal constraints are akin to Henderson, Stalnaker, and Taylor's (1988) concept of *antecedent constraints*, those constraints that affect preferences before intervening constraints, and can include an array of psychosocial factors including anxiety, confidence level, and prior socialization, which can include gender roles.

The literature surrounding gender and constraints to leisure in general is founded upon the framework that acknowledges that while structural constraints, such as money, time, and access to facilities are universal, social norms facilitate different leisure experiences both behaviorally and psychologically for marginalized groups such as women (Henderson, 1991). Traditional notions of gender roles both prescribe forms of leisure that are specific to men and women, as well as prioritize leisure time in general differently for each gender. Henderson et al.'s (1988) study used gender-role theory to contend that barriers for women's participation in physically active leisure are informed by constraints inherent to gender roles and cultural expectations. The way in which society defines gender roles creates circumstances that may proscribe a particular set of leisure activities for both men and women (Shaw et al., 1991). For example, women are expected to participate in feminine leisure activities, such as dance or yoga, while ice hockey and football are considered masculine sports and thus, played primarily by men (Jackson & Henderson, 1995; Shaw, 1994).

Not only do social roles prescribe particular activities for men and women, they also prioritize those activities within other expected behaviors. The "ethic of care" compels women to provide for the needs of others first, often neglecting their own needs and wants, including leisure participation (Henderson & Allen, 1991). This barrier is particularly salient for women with partners and children, as women tend to place a lower priority on physical activity and leisure participation in comparison to men, placing their family's needs and wants ahead of their own. Men, meanwhile, feel more entitled to leisure and are more likely to give precedence to personal leisure over domestic responsibilities (Henderson & Bialeschki, 1991; Kay, 1998), and are less likely to adapt their leisure activities in response to intervening constraints such as demands from their family (Maume, 2008).

Shaw (1994) further argued that even structural constraints that may be common to men and women stem from different sources. For example, while both men and women report financial barriers, the lower earning power of women in the workplace is an antecedent to the intervening barriers to participation that can stem from economic constraints, including lack of facilities, transportation, and access. The financial strain associated with a single income creates an even greater barrier to leisure for single mothers (Kimmel & Connelly, 2007).

Constraint Negotiation

Crawford and Jackson (2005) criticized that much constraint work has focused on the measurement of structural constraints, and that the theoretical mechanisms through which con-

straints are negotiated are equally important to understanding participation in and experiences of leisure. The concept of negotiation-efficacy stemmed from efforts by several authors (Henderson, Bedini, Hecht, & Schuler, 1995; Hubbard & Mannell, 2001) to better understand the leisure constraint negotiation process through theoretical development. These authors discussed the potential utility of a social-cognitive approach to explain behavior, specifically Bandura's self-efficacy theory (1982, 1994). Self-efficacy is "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (Bandura, 1994, p. 71). In applying this idea to constraint negotiation, people with higher levels of efficacy will persevere in their coping efforts despite constraints, whereas those who have doubts about their ability to overcome obstacles may reduce their efforts or cease involvement in the activity (Loucks-Atkinson & Mannell, 2007).

Loucks-Atkinson and Mannell (2007) were the first to coin the term negotiation-efficacy. In their study on constraint negotiation of individuals with fibromyalgia syndrome, they found a positive relationship between negotiation-efficacy and negotiation efforts. The more confident individuals were in their ability to cope with constraints, the greater their efforts were to negotiate and overcome those constraints. This work was extended by White (2008), who found that negotiation-efficacy would increase motivation, diminish the perception of constraints, and encourage negotiation efforts, thus having an indirect positive effect on participation in outdoor recreation. Similarly, Ridinger et al. (2012) provided further support for the incorporation of the construct into leisure behavior studies, as they found that marathon runners with higher negotiation-efficacy were more committed to running, and were more likely to credit their own negotiation efforts for their ability to participate.

As a measurement of perceived ability to overcome constraints, negotiation-efficacy can offer new insight into the established differences between the constraints of men and women. As a new construct, however, it has not been empirically tested extensively. Dixon's (2009) qualitative study on working mothers, revealed the connection among previously established constraints, negotiation through them, and the subsequent feeling of confidence. By viewing their own activity or participation as ultimately beneficial for their families, women effectively overcame the guilt and increased their sense of entitlement to be active. Those women who successfully negotiated through constraints felt more confident in their ability to find ways to be involved in leisure activities. In other words, they developed negotiation-efficacy, which led to a greater connection to their activity.

As mentioned previously, Ridinger et al. (2012) were the first to find significant differences in negotiation-efficacy scores between male and female marathon runners, suggesting that women's higher scores were a necessity for participation, due to the greater level of constraints they had to overcome as females. They did not measure specific constraints, and were therefore unable to assess the relationships amongst barriers, gender, and negotiation-efficacy. The question remained whether higher levels of negotiation-efficacy were an important driver in women's ability to participate in full marathon events due to the additional time commitment required to train for a full marathon.

Diminishing participation in physically active leisure for both genders after marriage and childbirth in particular (Nomoguchi & Bianchi, 2004) have led to interest in the way in which family support for active leisure may serve as a moderator in constraint negotiation and may actually enhance opportunities to participate in physical activity (Goodsell & Harris, 2011). Commitments to family, work, and leisure pull individuals in different directions, which result in demands in time that exceed available hours (Stebbins, 1992). However, when faced with

struggle or difficulty, individuals are most likely to turn to their spouses or partners for support (Burke & Weir, 1982). Such support, in turn, can encourage individuals to continue their pursuits. Therefore, in the same way that family commitments can serve as a constraint to participation, support may serve as a correlate to negotiation. In a study on long-distance runners, Barrell, Chamberlain, Evans, Holt, and MacKean (1989) found that the opportunity to run could be a function of spousal support. While some work has focused on family support's moderating role in the effect that leisure activity has on perceived leisure family conflict (Glover & Shudder, 1998; Goff, Fick, & Oppliger, 1997), there is less empirical work examining the role of spousal support in enhancing or limiting physically active leisure. In one exception, Goodsell and Harris (2011) performed in-depth interviews in order to uncover both the constraints to marathon running within family life and the strategies used within the family to negotiate through leisure-family conflict and allow opportunities for participation. These authors found that while both husbands and wives experienced conflicts that interfered with running, these barriers were not insurmountable, especially when supported by a spouse or partner.

Research Questions

The general leisure constraint literature suggests that there are barriers to participation that originate in gender norms and relations (Henderson, 1991; Henderson & Allen, 1991; Maume, 2008; Shaw, 1994). Similarly, there are attitudes and perceptions that may help individuals in general to negotiate through greater levels of constraint to facilitate participation (Goodsell & Harris, 2011), but some attitudes may be more salient for women in overcoming barriers inherent to their gender (Dixon, 2009; Ridinger et al., 2012). The question remains whether these same patterns can be seen within women who have already overcome initial barriers to participation in serious leisure, and who must now negotiate for greater amounts of involvement. In this case, running full marathons requires longer and more frequent training, and it may be that at this level, time commitment constraints that affect women more in general become particularly salient. Therefore, the aim of this research is to explore quantitatively the differences in constraints and constraint negotiation for women and men at two different stages of engagement in a serious leisure activity. As this research additionally seeks to understand differences across gender in relation to constraints, it also examines the difference between men and women in the correlates to participation in the same race, in an attempt to uncover differences in the demographic and attitudinal variables that inform participation in serious leisure for men and women. We therefore ask the following question:

RQ1: What are the differences in constraint correlates and negotiation correlates between runners of different genders and different event distances?

Exploring the differences in participant profiles is useful for describing potential reasons that individuals may or may not be participating at different levels of this activity, but it does not examine the ability of these reasons for actually predicting participation. While general observation has shown that gender itself is a predictor of event type, we also aim to explore the relationship between the barriers and correlates to participation in relation to gender with the following question:

RQ2: Do constraint correlates and negotiation correlates predict levels of participation differently for men and women?

Method

Sample and Survey Design

A survey research design was used to gather data from a sample of individuals who participated in a marathon and half marathon event that took place in the Southeastern United States in early 2012. An online survey was developed and distributed to participants via email using registration data provided by the race organizers. The survey was sent to 23,793 registered runners with valid e-mail addresses who completed the event. An initial invitation was sent 10 days after the event. A reminder message was sent seven days after the initial invitation, and the survey closed after 17 days. A total of 3,453 marathon and half marathon participants completed the 20-minute survey for a response rate of 14.6%. The population characteristics of this sample were compared with those of the overall race population using the internal registration database provided by race organizers. Overall, the sample was found to be representative of the race population in terms of race type, gender, ethnicity, and age. Further, as suggested by Jordan, Walker, Kent, and Inoue (2011), early respondents were compared to late respondents, who more closely mirror non-respondents, and no statistical differences were found across demographic information or key variables, including: gender ($t = .375, p = .707$), income ($t = .153, p = .878$), age ($t = .366, p = .715$), number of children ($t = 1.42, p = .156$), perceived family support ($t = .368, p = .713$), negotiation-efficacy ($t = .038, p = .970$), number of running events each year ($t = 1.42, p = .157$), and miles per week ($t = .265, p = .791$). These analyses allow the findings within this sample to be generalized to the entire race population.

Measures

Demographics and running profile. In addition to the variables of interest, gender and other demographic information, including income and family structure, was captured to represent the established structural constraint correlates of previous literature. Extensive information on family structure was collected measuring not only marital status (i.e., operationalized as single or married/living with a partner) and number of children in the household under the age of 16, but also determining number of children under the age of five. This measure was based on the findings of Nomaguchi and Bianchi (2004), who found that the presence of one or more children under the age of five was a significant determinant for both men and women in the amount of time they spent on physically active leisure. These two measurements were then split into scale variables representing “number of children between the ages of 5 and 15,” and “number of children under 5.”

The survey also collected behavioral information for the purpose of controlling for the level of behavioral involvement with long-distance running. This included race distance, number of races in the past 12 months, and average number of miles run per week, which was measured in 10-mile increments. Finally, separation of marathon runners and half marathon runners was determined by asking individuals who ran the half marathon if they had ever run a full marathon before. This was done to separate runners with marathon experience and those without.

Negotiation-efficacy. Three negotiation-efficacy statements were adapted for running by Ridinger et al. (2012), converting White's (2008) original wording for outdoor recreation: “I enjoy overcoming obstacles to participate in running,” “In the past, I have been successful getting around the barriers to my running,” and “People I admire find ways around challenges they face when trying to run.” A seven-point Likert scale was used, ranging from *strongly disagree* to *strongly agree*. The three items from the scale were combined to form a single overall score in

negotiation-efficacy. Cronbach's α for these three items in this study was found to be .60. While this is lower than the .70 benchmark suggested by Nunnally (1978), Cortina (1993) suggests that a lower coefficient alpha is not necessarily associated with low reliability for scales that have a low number of items. In this case, it is appropriate to perform a principle component analysis to confirm single-item loading. The construct of negotiation-efficacy loaded on a single component with an Eigen value of 1.654.

Family support. A single item of global family support was adapted from Goff et al.'s (1997) scale of spousal support for distance runners: "My family supports my running." Similar to negotiation-efficacy, this item was measured on a 7-pt Likert scale ranging from (1) *strongly disagree* to (7) *strongly agree*. This single item was selected as a measure of global familial support, similar to other global evaluation items such as satisfaction (Nagy, 2002) and self-esteem (Robins, Hendin, & Trzesniewski, 2001), which have been found to be both valid and reliable.

Results

Descriptives

Within the overall sample of 3,453 respondents, 50.2% were female. The majority of respondents (63%) were ages 25–44, 61% were married or living with a partner, 82% had a degree from a four-year college or higher, and 69% had incomes over \$75,000. In terms of race and ethnicity, 58% were Caucasian, 32% were Hispanic/Latino, 4% were African American, and 3% were Asian. Respondents were then separated into those who had participated in a full marathon ($n = 1305$) and those who had not ($n = 1129$). A complete demographic and behavioral table of participants is presented in Table 1.

Research Question 1

MANOVA results of RQ1 comparing the variables of interest between women with marathon experience to women with only half marathon experience showed that marathon experience was associated with a higher income ($F(1, 1305) = 9.78, p < .01$), being older ($F(1, 1305) = 29.19, p < .001$), participating in more running events per year ($F(1, 1305) = 171.07, p < .001$), higher negotiation-efficacy ($F(1, 1305) = 18.14, p < .001$), and higher levels of perceived family support ($F(1, 1305) = 5.23, p < .05$). There were no significant differences in number of children between 5 and 15 ($F(1, 1305) = 3.00, p = .08$) and number of children under the age of five ($F(1, 1305) = 0.60, p = .44$). Chi-square comparison between marathon experience and marital status, the single categorical dependent variable, also showed that women who ran the full marathon were significantly more likely to be married ($X = 6.82, p < .05$). A second MANOVA comparing men with marathon experience to men with only half marathon experience found marathon experience to be associated with higher levels of income ($F(1, 1243) = 6.51, p < .05$), fewer children under the age of five ($F(1, 1243) = 4.37, p < .05$), being older ($F(1, 1243) = 31.93, p < .001$), more running events each year ($F(1, 1243) = 97.93, p < .001$), and higher levels of negotiation-efficacy ($F(1, 1243) = 30.05, p < .001$). There were no significant differences found across number of children between the ages of five and 15 ($F(1, 1243) = 2.07, p = .15$), or perceived family support ($F(1, 1243) = 0.49, p = .48$). Chi-square test showed no significant relationship between marathon experience and marital status for men ($\chi = 0.47, p = .51$).

Comparing men and women with only half marathon experience, MANOVA results found that being male was significantly associated with having higher incomes ($F(1, 1177) = 17.28, p < .001$), having more children between the ages of five and 15 ($F(1, 1177) = 4.85, p < .05$), having more children under the age of five ($F(1, 1177) = 14.33, p < .001$), being older ($F(1, 1177) =$

Table 1

Demographic and Behavioral Information

	Men	Women
Basic Family Structure		
Single without Children	26.4%	38.0%
Single with Children	6.0%	7.0%
Married/living with partner (w/out children)	19.2%	19.5%
Married/living with partner (w/children)	48.4%	35.5%
Children between ages 5 and 15		
None	58.3%	66.3%
One	27.9%	21.3%
Two	10.4%	9.0%
Three or more	3.3%	3.4%
Children under 5		
None	65.7%	72.6%
One	19.0%	17.1%
Two	11.8%	7.2%
Three or more	3.5%	3.0%
Income		
\$75,000 and less	30.9%	41.5%
\$75,001-\$150,000	40.8%	38.1%
More than \$150,000	28.3%	20.4%
Event Type		
Half Marathon	67.6%	79.1%
Full Marathon	32.4%	20.9%
Other Running Behaviors		
Miles Per Week (M)	28.0	24.8
# of Running Events per Year (M)	5.4	4.7
# of Running Events in the next 12 Months (M)	5.7	5.2

Note. All numbers rounded to the nearest tenth, and for this reason, percentages may not add to exactly 100% in some cases.

29.02, $p < .001$), and participating in more running events per year ($F(1, 1177) = 13.43, p < .001$). There were no significant differences in negotiation-efficacy ($F(1, 1177) = 1.53, p = .22$) or perceived family support ($F(1, 1177) = 1.58, p = .21$). A chi-square test of the relationship between gender and marital status showed that men were more likely to be married at this race distance ($\chi = 31.61, p < .001$).

Comparison between men and women with marathon experience found that being male was significantly associated with higher income ($F(1, 1371) = 16.03, p < .001$), having more children between the ages of five and 15 ($F(1, 1371) = 4.53, p < .05$), having more children under the

age of five ($F(1, 1371) = 7.81, p < .01$), and being older ($F(1, 1371) = 38.19, p < .001$). Conversely, being a female was significantly associated with having higher levels of negotiation-efficacy ($F(1, 1371) = 12.15, p < .01$) and higher levels of perceived family support ($F(1, 1371) = 10.94, p < .01$). There was no difference in terms of participation in running events every year ($F(1, 1371) = 1.45, p = 0.23$). Chi-square test showed that men were significantly more likely to be married ($\chi^2 = 16.88, p < .001$).

Research Question 2

A binomial logistic regression was used to test RQ2, examining constraint and negotiation correlates' prediction ability on the level of participation in distance running, half marathon (0) or full marathon (1), as well as the differences in prediction for men and women. First, the overall model found that being male ($\beta = -.53, p < .001$), greater income ($\beta = 0.06, p < .01$), fewer children under 5 ($\beta = -0.18, p < .01$), more children between the ages of 5 and 15 ($\beta = 0.11, p < .05$), and higher negotiation-efficacy scores ($\beta = 0.26, p < .001$) predicted the decision to participate in a full marathon. In terms of a gender comparison, an independent samples comparison found that there were no significant differences in beta-weight for any of the significant predictors of participation level, including income ($t = 0.21$), children under 5 ($t = -.02$), and negotiation-efficacy ($t = -1.23$). A complete summary of the logistic regression can be found in Table 2.

Table 2

Logistic Regression Results

	Overall Model			Men			Women		
	(β)	(p)	Exp (β)	(β)	(p)	Exp (β)	(β)	(p)	Exp (β)
Income	0.067	0.001	1.069	0.069	0.011	1.072	0.062	0.026	1.064
Single_married	-0.038	0.705	0.962	0.089	0.551	1.093	-0.151	0.273	0.86
Kid_under_5	-0.183	0.001	0.833	-0.182	0.011	0.834	-0.18	0.028	0.835
Kids_5_to_15	0.109	0.048	1.116	0.114	0.145	1.12	0.1	0.206	1.105
Fam_Support	0.003	0.991	1.000	-0.014	0.808	0.986	0.011	0.836	1.011
Neg_Eff	0.258	<.001	1.294	0.203	0.005	1.225	0.306	<.001	1.358
Gender	-0.533	<.001	0.587	-	-	-	-	-	-

Note. Income measure used in this model is individual median income for ranged categories. Single_married is based on a dichotomous variable (single = 0, married/living with partner = 1); Fam_Support = mean score of global family support item; Neg_Eff = composite average of negotiation-efficacy.

Discussion

The purpose of this study was to explore the ability of constraints and constraint negotiation to explain the participation differences for female and male long-distance runners at two different types of engagement in a serious leisure activity. The first research question sought to understand potential differences in the constraint correlates and negotiation-efficacy levels that make up the profiles of runners of the same gender, but that participate in different race distanc-

es. Results showed that women who had marathon experience were older, more likely to be married, have a higher income, and have greater levels of both negotiation-efficacy and perceived family support in comparison to women with only half marathon experience. Similar to women, men with marathon experience were more likely to be older, have a higher income, participate in more running events each year, and have greater levels of negotiation-efficacy when compared to men with only half marathon experience. These mirrored findings suggest that income, behavioral involvement (i.e., greater amounts of time commitment), and a greater perception in one's ability to overcome barriers may be salient correlates for both men and women to move from the half marathon level to the full marathon level. The significance of behavior and income supports previous literature on serious leisure showing that greater amounts of resources are required as time commitments increase within the serious leisure activity (Stebbins, 1992). This movement also requires stronger attitudes that allow individuals to overcome the barriers of an increased time commitment, reflected in this study by the significant increase in negotiation-efficacy between the half and full marathon.

Perceived family support and marital status were significant factors for women but not for men, suggesting a support system might be more necessary for women at the full marathon level of engagement. While research has shown that family can act as a barrier for women perceived to be primary caregivers (Henderson & Allen, 1991), family support can actually act as a facilitator, allowing for increased involvement with an activity (Goodsell & Harris, 2011). This level of support, however, does not seem to be salient for men running a full marathon distance.

Non-significance in the number of children for women suggests that the barrier of having children may not be salient for women at this stage of involvement, particularly when viewed in conjunction with the high overall mean of perceived family support within this group. This further supports previous literature on spousal support, even though the presence of children, especially young children, can add a potential barrier (Nomaguchi & Bianchi, 2004). Meanwhile, the presence of young children did play a role for men, supporting Nomaguchi and Bianchi's contention that having children under the age of five significantly decreases an individual's ability to participate in physically active leisure. This overall finding seems to contradict the literature that states the presence of young children is more likely to be a barrier for women than men (e.g. Maume, 2008). However, this may be explained by the distinction between the constraints to physical activity in general, and the constraints associated in the pursuit of serious leisure. Nomaguchi and Bianchi's study looked at overall rates of physical activity, but the attitudes and motivations associated with the pursuit of serious leisure eliminate some barriers and create new ones (Stebbins, 2001). Therefore, the differences between the constraint correlates of men and women may be explained by the significant differences for men and women in perceived family support at the marathon level. As women's levels are significantly higher than men's, they may be more able to overcome the barrier of young children because they feel a greater amount of support as they make the decision to take the training time necessary to run full marathons.

In terms of men and women running the same distances, results found that for both half and full marathoners, men were more likely to be older, married, have greater income, and have more children. This suggests that men are more likely to be able to participate in these distances than women after marriage and childbirth, and that at this stage, the ethic of care as suggested by Henderson and Allen (1991) may still be stronger for women than men, as men feel more justified in taking leisure time after marriage and children (Maume, 2008).

Similar to Ridinger et al. (2012), those women who allow themselves the necessary time to train for the full marathon had significantly higher levels of perceived family support and negotiation-efficacy than their male counterparts. Complimenting this finding, non-significance

in negotiation-efficacy and perceived family support across those who ran the half marathon is reflective of the greater percentage of women who are able to participate at this level. A greater level of negotiation attitudes are no longer necessary to participate, as women have populated this distance.

Finally, at the half marathon level, men participated in significantly more running events than women, but this was not evident for those with marathon experience. Similar to the results found between individuals of the same gender running in different races, there is evidence of increased behavioral involvement that comes with higher levels of serious leisure. While certain constraints may preclude women from participating in as many events as men involved at the half marathon level, the commitment associated with running full marathons transcends those constraints for those who run 26.2 miles. Scott and Schafer (2001) contended that at a certain level of commitment and behavioral involvement, individuals have a personal investment that prioritizes the activity among other life facets. Although the percentage of women making the commitment to running full marathons is lower, those who do, prioritize it in their life equally as their male counterparts.

While these findings created a more complete profile of event participants across genders at both the half and full marathon distance, findings of research question two failed to find a link between these correlates and actual participation choice. Participation for both men and women was predicted positively by higher scores in negotiation-efficacy, and negatively predicted by the presence of children under the age of five. The presence of children between the ages of five and 15 also significantly predicted event level for men. There was, however, no significant difference in the strength of their prediction, suggesting that the decision that leads to a difference in participation rates between men and women is not informed merely by family structure or the perceived ability to overcome constraints. Therefore, while negotiation-efficacy appears to be a significant component necessary to move to levels of serious leisure requiring a greater temporal commitment, more research is needed to understand other predictors that are affected by gender.

Implications

This study has both theoretical and practical implications. Theoretically, this study contributes to the sparse conversation on the role of gender in serious leisure. While the topic of serious leisure has been well explored since Stebbins (1982) first coined the phrase, understanding how gender differences operate in this space has received less scholarly attention. Previous literature has shown that serious leisure can operate as a form of resistance and identity for women outside of their gender roles (Dilley & Scraton, 2010; Rainsborough, 2006). To an extent, distance running has become a source of identity, as the activity is no longer gendered in the same way. However, the remaining significant differences across participation levels are still under researched. While results of this study found that gender is associated with different levels of participation, it does not actually inform the choice of which distance to run. Therefore, constraints may not be the answer to understanding why women run the full marathon at significantly lower rates than other distances. Women may simply define their serious leisure with distance running differently, such that the greater time commitment associated with longer distances does not equate to a more serious form of the activity for them. Cohen-Gewerc and Stebbins (2013) have suggested that serious leisure may be a way to carve out a kind of individuality for those engaged in a particular activity, and it may be that women have simply created a different path of personal choice in event distance.

This study also adds to the growing shift from measuring actual structural constraints to a conversation of research that seeks to understand the ways in which participation in leisure, particularly serious leisure, is both created and maintained. While the dialogue surrounding constraints should continue, individual processing of constraints must be theoretically supported through examination of constructs such as negotiation-efficacy. Recent research has examined the relationship among constraints, constraint negotiation, and participation (e.g., Loucks-Atkinson & Mannell, 2007), but the relationship between this process and antecedent constraints such as race, gender, and socioeconomic status has yet to be explored. This study moves the conversation forward by revealing connections between gender and this process in the pursuit of a serious leisure activity.

Practically, the recent surge in recreational running spurred on greatly by the increase in female runners over the past 10 years allows for a unique examination of a single type of physically active leisure that has shifted from being male-dominated to an activity accepted for both sexes. While such gender divisions still exist within other forms of physical activity (e.g., various team sports, yoga, and dance), running has, in some ways, transcended gender expectations. Examining the changes in norms for a particular form of leisure can help illuminate the markers through which the factors that still affect individuals play a role in participation levels.

Limitations/Future Directions

While this study measured more objective constraint correlates along with negotiation-efficacy, it did not measure level of perceived constraint. This study chose to focus rather on the psychological markers exposing intrapersonal constraints that have been shown to be difficult to operationalize (Henderson et al., 1988; Crawford & Jackson, 2005). Therefore, while the differences in negotiation-efficacy suggests different paths through barriers to participation, this study cannot conclude that women's higher negotiation-efficacy scores are directly the result of perceived barriers that are inherent to their gender, only that they are related to the correlates that create actual constraints.

Furthermore, while this study measured the constraint correlates to several intrapersonal, interpersonal, and structural constraints, it did not measure the antecedents to these constraint correlates beyond gender categorically. Specifically, failure to find differences in the actual experiences of leisure between men and women suggests that other attitudes that are informed by social structure may actually be better predictors of differences in manifestations of participation. As Shaw (1994) suggests, the psychological and social gendered mechanisms that affect both preferences to leisure as well as participation often happen outside of the conscious awareness of the individual. Having established that gender plays a role in the attitudes of those engaged in serious leisure, additional work is needed to understand more how this manifests itself in behavior through the effects of social barriers.

As distance running is still a form of serious leisure occupied by predominantly white, affluent individuals (Running USA, 2013), it still filters out individuals based on other antecedent constraints, namely race and socioeconomic status. Therefore, future studies would help to better understand how this filter associated with race and class informs the constraint and negotiation process more acutely for this activity, at least in the United States. Similar to gender, race can serve as a barrier to serious leisure at all points along the continuum, and therefore examining the constraints of other racial groups at different stages of involvement within a given activity would complement understanding how antecedent constraints in general inform serious leisure. Additionally, the extent to which this filter is unique to the social norms of the United States

should be explored. Future research should include additional potential sociological measures to understand the weight of these norms, and compare them to the social barriers that affect individuals in other societies.

Finally, this study focused on one particular form of serious leisure, long-distance running, and the differences that occur across gender at two specific race distances within the overall activity, and therefore the generalizability of these findings are somewhat limited. Assessing differences across individuals in distances shorter than the half marathon and longer than the full marathon might illuminate the factors that inform participation across all levels of engagement. Similarly, comparing the experiences of those who participate in road races more or less frequently might uncover different serious leisure experiences across this continuum. Additionally, this phenomenon should be observed in other forms of serious leisure, and any parallels and differences in the influence of the type of leisure on these correlates should be explored.

Conclusion

Long-distance running has grown in recent years from a male dominated activity to a space of serious leisure occupied by both men and women. However, disparities still exist, as evidenced by the gap in participation at distances of 26.2 miles and longer. This study examined the constraint and negotiation correlates to participating in longer distances, and attempted to uncover any connection in these correlates to gender, itself an antecedent constraint. In exploring the characteristics both demographically and attitudinally across both genders and distances, it attempted to better understand those correlates to constraints that are most salient for a particular gender or a particular level of involvement with the activity, as well as those negotiation correlates that are important in facilitating the level of commitment it takes to participate in long-distance running.

Findings supported the general leisure constraint literature in suggesting that there may be different constraints at different levels of participation for men and women. Furthermore, women who are able to overcome barriers to participation have greater beliefs in their own ability to overcome constraints and also believe that their family supported them in their efforts to achieve this level. Since the seminal work on gender and constraints (e.g., Henderson et al., 1988; Henderson & Allen, 1991; Shaw, 1994), much progress has been made in terms of women's participation in sport and serious leisure activities and is reflected in the growing numbers of women participants in long-distance running. However, while this study's comparison of two levels of the same activity revealed that constraint variations between men and women may still exist, the gender differences did not predict the choice of distance. Therefore, the sole reliance on constraints as a conceptual framework may not be sufficient for understanding participation rates for the full marathon versus those of shorter race distances. The activity of distance running as a serious leisure pursuit may be perceived and defined differently for men versus women, and this requires the integration of broader sociological approaches that highlight potential fundamental differences in expectations between men and women in their leisure pursuits, and the sources of such differences. While the results of this study did not find gender to be significant in predicting event distance, they do suggest the existence of a more complex relationship between gender and serious leisure, and provide an initial conversation surrounding the facets affecting the serious leisure experience of distance running for women and men.

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Toward a Structural Model of Challenge Experience in Adventure Recreation

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Abstract

Perceiving challenge is an important aspect of adventure recreation. Yet few studies have considered the potential outcome of challenge perception among participants in adventure recreation. This study seeks to address this by establishing a comprehensive model of challenge perception in adventure recreation that additionally models the relationship between challenge and its outcome. A self-administered questionnaire is designed to collect empirical data from recreationists who engaged in scuba diving, high-altitude mountaineering, or white-water rafting in Taiwan. Using a structural equation modeling approach, the findings indicate that perception of challenge among recreationists has a positive impact on flow experience and, by extension, on satisfaction, and psychological well-being.

Keywords: *challenge perception, flow experience, satisfaction, psychological well-being, adventure recreation*

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Introduction

Adventure recreation is receiving growing attention in both the academic and business spheres (Wu & Liang, 2011). It is defined as an outdoor activity in which participants deliberately seek challenge through interaction with the natural world (Ford & Blanchard, 1993). Cordes and Ibrahim (2003) show that challenge and stimulation are among the major attractions of adventure recreation. Previous studies confirm that one of the motivations for engaging in adventure recreation is to experience challenge (Ewert & Hollenhorst, 1989; Lee, Graefe, & Li, 2007; Manfredo, Driver, & Brown, 1983), suggesting a close relationship between challenge and adventure recreation.

Recreation operators provide a variety of adventure activities to meet recreationists' expectation of challenge, such as mountaineering, whitewater kayaking, whitewater rafting, and scuba diving. Previous studies on adventure recreation have primarily looked at the psychological and behavioral aspects of participation in adventure activity from different theoretical points of view, including motivation (Lee et al., 2007), specialization (Thapa, Graefe, & Meyer, 2006), flow (Wu & Liang, 2011), fear (Carnicelli-Filho, Schwartz, & Tahara, 2010), and risk (Creyer, Ross, & Evers, 2003). Few studies have looked into psychological and behavioral models for participation in adventure activities from the perspective of challenge perception.

Psychological studies describe challenge as an outcome of stress appraisal. Individuals assess the interplay of person-environment, utilize their resources, and then embrace the potential for gain or growth (Lazarus & Folkman, 1984). Challenge can increase one's personal resource load yet retain the potential for benefit or growth (Lazarus & Folkman, 1984). Among the literature on leisure, challenge perception has been described as an extension of personal limits, a sense of novelty, and the experience of stimulation (Caldwell, Smith, & Weissinger, 1992). In leisure life, challenge can reduce boredom (Barnett, 2005; Caldwell et al., 1992). Priest (1992) believes that challenge is an interaction between external risks and internal abilities, or, in context of adventure recreation, a situation in which participants apply their personal abilities to resolve the risks produced by adventure. The motivation of challenge in adventure recreation embodies the motives of excitement, personal testing, and accomplishment (Pomfret, 2006).

Csikszentmihalyi (1975) defined flow as a situation in which an individual's perception of an activity's challenge matches the individual's perception of his or her personal skill. Flow is also described as the "state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it at great cost, for the sheer sake of doing it" (Csikszentmihalyi, 1992). Challenge therefore plays an important role in recreation participation. The subject of challenge has a long history of development in both the work and education fields. Numerous studies have demonstrated that challenge perception can evoke emotional and behavioral responses in individuals, such as satisfaction (Dewettinck & Buyens, 2006), effective commitment (Dewettinck & Buyens, 2006), positive emotion (Skinner & Brewer, 2004), enjoyment (Koka & Hein, 2003), happiness (Noor, 1995) and working smart (Holmes & Srivastava, 2002). Based on qualitative interviews, Schmidt and Little (2007) note that the sensation of challenge in an activity can trigger a spiritual experience in the participant. Although challenge seems to have positive results for activity participants, few empirical studies have verified the psychological process of challenge perception in adventure recreation participants.

This study attempts to establish a model of challenge perception in adventure recreation from the perspective of personal experience. Past studies have noted that flow state, satisfaction, and psychological well-being are potential outcomes of participation in recreation activi-

ties (Jones, Hollenhorst, Perna, & Selin, 2000; Lee, Shafer, & Kang, 2005; Poon & Fung, 2008). From the vantage of recreation operators, an important business consideration is how to give customers a feeling of satisfaction and happiness. Clarification of the relation between challenge and its outcomes can help companies to develop strategies leading to customer satisfaction. In terms of theory development, exploration and confirmation of a challenge perception model for adventure activity can address a gap in previous research. In sum, the purpose of this study is to examine the potential outcomes of challenge perception, including flow experience, satisfaction, and psychological well-being, among participants in adventure recreation.

Literature Review and Research Hypothesis

Adventure Recreation

Adventure recreation encompasses a broad variety of land, air, and water activities, such as whitewater rafting and kayaking, rock climbing, hiking, paragliding, and scuba diving (Pomfret, 2006). Ewert, Galloway, and Estes (2001) define adventure recreation as “recreational and/or educational activities utilizing a closer interaction with the natural environment, that contain elements of real or perceived risk and danger, in which the outcome, while uncertain, can be influenced by the participant and circumstance.” Robinson (1992) believes that a fundamental element distinguishing adventure recreation from other recreation activities is “duality of experience.” That is, when a participant in adventure recreation has sufficient control over the outcome of an activity, it is likely to evoke a positive experience, such as sense of competence and increased stimulation. On the other hand, when the individual is unable to control the outcome of the activity, the experience is more likely to be characterized by negative feelings, such as fear or anxiety.

Challenge perception. Challenge perception has roots in the stress appraisal theory of Lazarus and Folkman (1984). Stress is defined as a relationship between an individual and the environment related to his or her well-being, where this relationship increases or exceeds personal resource loading (Lazarus & Folkman, 1984). According to the stress appraisal theory, stress may be assessed as a threat or a challenge (Lazarus & Folkman, 1984). A threat refers to the potential for harm or loss that has not yet occurred but is anticipated. An example of a threat appraisal in a stressful recreational situation is “I started to doubt my ability.” Challenge appraisals are generally more positive and reflect the anticipation of mastery or a beneficial outcome. Examples of challenge appraisals are “I feel positive about demanding encounters” and “I am in control of the situation.” Recreationists experience challenge in situations where they need to use resources or capabilities with a positive attitude in order to control the situation (Tsauro, Lin, & Liu, 2013). Thus, recreationists who perceived challenge are more likely to have a positive experience.

Baird and Penna (1996) believed that challenge includes cognitive and affective components that must reach a certain level in order to be perceived. Challenge generally occurs in situations of stress (Skinner & Brewer, 2004). In this context, stress means the hindrance one faces when exerting effort in the overcoming process (Smith & Ellsworth, 1985) and which heightens an individual's level of concentration towards the task at hand (Krohne, 1996). Challenge perception can also increase one's sense of control in specific situations and increase or maintain levels of confidence, sensitivity, and a proper level of arousal (Anshel, 2001).

In a study by Smith and Ellsworth (1985), respondents describe the feeling of challenge as confidence. They believe that, despite the additional effort needed, they could achieve the

expected goal. The perception of challenge was also associated with many positive emotions in addition to confidence, such as eagerness, hope, and excitement (Anshel, 2001; Folkman & Lazarus, 1985). Pintrich and Schrauben (1992) also find that challenge is fundamentally related to the perception of positive feeling and that this perception tends to encourage participation in learning.

The literature on leisure and recreation defines challenge from a number of different perspectives. From the viewpoint of the characteristics of recreation activities, the challenges presented by the activity (and perceived by the individual) are central to the model of flow-producing experiences (Csikszentmihalyi, 1975). Wu and Liang (2011) define challenge as the complexity of an activity based on flow theory. However, most studies proceed from the viewpoint of personal experience to define challenge as a tendency of a person to reach beyond their limits and a recreational experience imparting a sense of novelty and thrill (Barnett, 2005; Caldwell et al., 1992). When high intrinsic challenge is a motivating factor in an activity, participants tend to choose recreational activities that require skills slightly higher than their own (Weissinger & Bandalos, 1995). Moreover, they tend to perceive this state as a challenge and not as a detriment or a threat (Weissinger & Bandalos, 1995). This study is based on stress appraisal theory (Lazarus & Folkman, 1984). The challenge measured is the result of interaction between the individual and the environment. Therefore, this study defines challenge perception as the recreationists' perception of using their abilities to the fullest in an activity, as well as the sense of involvement and excitement (Caldwell et al., 1992).

Outcome of challenge perception: Flow experience, satisfaction, and psychological well-being. The concept of flow presented by Csikszentmihalyi (1975) is a mental state produced when there is balance between the challenge presented by an activity and the skill required to perform the activity. Massimini and Carli (1988) developed a model that operationalized the following four channels of flow: (1) flow occurs when challenge and skill are above one's personal mean, (2) anxiety occurs when challenge is above the personal mean and skill is below, (3) boredom occurs when skill is above the personal mean and challenge is below, and (4) apathy occurs when both challenge and skill are below the personal mean (cited as Jones et al., 2000). The emotions predicted by the flow model are unrelated to the objective nature of the activity and come, rather, from an individual's subjective perception of the challenge of the activity and available skills (Decloe, Kaczynski, & Havitz, 2009). Asakawa (2010) points out that, apart from the balance between challenge and skill, flow is an optimal inner state involving a sense of absorption, high motivation, and a high level of pleasure. Flow is characterized as high involvement, deep concentration, and sense of passage of time (Csikszentmihalyi, 1975; Han, 1988). In physical activity, the experience of flow is considered an especially important factor in raising self-esteem and encouraging future participation (Stein, Kimiecik, Daniels, & Jackson, 1995).

Flow theory explicitly identifies challenge as an important antecedent of flow experience. Many studies demonstrate a positive relationship between challenge perception and flow experience in adventure recreation (Jones et al., 2000; Wu & Liang, 2011). Heo, Lee, McCormick, and Pedersen (2010) noted that flow experience is easily produced in serious leisure activities because these activities typically entail substantive challenge. Challenge perception implies that a participant is focused on the activity at hand, and this focus is an antecedent leading to a flow state (Stein et al., 1995). Wu and Liang (2011) show that rafting activities require greater degrees of concentration as the level of challenge rises, leading to a sense of the rapid passage of time and state of flow. Based on the above, this study makes the following hypothesis:

Hypothesis 1: Challenge perception has a positive effect on flow experience.

Satisfaction can be generally defined from affective and cognitive perspectives. In its affective sense, it is a real experience derived from the inner feelings produced in a visitor through interaction with the destination and activity (Baker & Crompton, 2000). Satisfaction is also an appraisal of the recreation experience overall and creates a state of inner pleasure (Lee et al., 2005). In terms of cognitive dimension, satisfaction is the consumer's response to the conformance between performance and expected standards; or alternately, a subjective assessment as to whether the chosen program meets or exceeds the expectations of the consumers (Oliver, 1980). Looked at broadly, satisfaction is a cognitive-affective state produced by cognitive assessment (including disconfirmation) and the feelings engendered by that assessment (Bigne, Andreu, & Gnoth, 2005).

People engage in adventure recreation for the challenge perception, since challenge is a principle motive (Ewert & Hollenhorst, 1989; Lee et al., 2007). Thus, participants in adventure recreation feel satisfaction when the expectation of challenge is satisfied by the activity. Further, the perception of challenge in recreation is also accompanied by a sense of novelty and thrill. Duman and Mattila (2005) demonstrate that, as the main motivations for participants, novelty and thrill can positively affect satisfaction. Therefore, this study expects challenge perception to have a positive impact on the satisfaction of recreation participants. Based on the above, this study makes the following hypothesis:

Hypothesis 2: Challenge perception has a positive effect on satisfaction.

According to previous studies, psychological well-being has at least three attributes: First, it is a subjective experience denoting the degree of happiness a person feels. Second, it is an expression of positive feeling and reduction of negative feeling. Third, it is a global judgment (Bradburn, 1969). Psychological well-being is defined as the "sum or balance of independent positive and negative feelings emerging from a given quality of life" (Bradburn, 1969). Psychological well-being is measured by the inclination of an individual's perception of happiness or pleasure, based on Bradburn Positive Affect Scales proposed by Bradburn (1969). Iwasaki and Smale (1998) noted that this scale has been among the most frequently used instruments to operationalize psychological well-being.

Some studies note that personal perception of challenge is accompanied by the positive feelings of excitement and pleasure (Dewettinck & Buyens, 2006; Skinner & Brewer, 2004). Dewettinck and Buyens (2006) further note that challenge produces a degree of activation that makes the central nervous system operate more efficiently, produces intelligence, and enhances behavior and positive feelings. Similarly, the concept of novelty inherent in challenge perception has been shown to be conducive to heightening sensory stimulation, enjoyment, arousal, and positive feelings (Duman & Mattila, 2005). The positive feelings mentioned are important components of psychological well-being. Therefore, challenge perception should lead to positive psychological well-being.

Hypothesis 3: Challenge perception has a positive effect on psychological well-being.

Relationships among flow experience, satisfaction, and psychological well-being. Flow experience is an important factor in understanding customer satisfaction (Chhetri, Colin, & Mervyn, 2004). Wu and Liang (2011) show that satisfaction in rafting activities increases with the level of flow experienced by rafters since flow can meet the individual's expectation and then enhance satisfaction. Furthermore, recreationists in a state of flow have a greater sense of control

over their external environment (Han, 1988). From a consumer assessment perspective, sense of control can increase satisfaction since greater sense of control can help the consumer make correct evaluations (Duman & Mattila, 2005). Therefore, when recreationists have an adequate sense of control over the adventure environment, the activity is more likely to proceed according to the recreationists' expectation, imparting a greater feeling of satisfaction. One aspect of flow experience is focused attention, here denoting the level of concentration during participation in recreation activities (Han, 1988). Herrick and McDonald (1992) demonstrate that the difficulty of rapids can enhance overall satisfaction among users of a recreational river. Difficult rapids encourage river users to concentrate, creating an overall sense of satisfaction with the recreation experience. In other words, focused attention can help people to overcome obstacles in the recreation process and gain a sense of satisfaction from achieving anticipated goals. Based on the above, this study makes the following hypothesis:

Hypothesis 4: Satisfaction increases with flow experience

Some studies have noted that psychological well-being can be improved through engagement in leisure activities (Brajša-Žganec, Merkaš, & Šverko, 2012; Staempfli, 2007). However, an activity's ability to positively influence psychological well-being hinges on whether the participant is satisfied with the outcome of the activity (Staempfli, 2007). Staempfli (2007) shows how leisure satisfaction can positively affect psychological well-being in young people, indicating that the more a leisure activity succeeds in satisfying psychological, educational, social, and relaxational motives, the greater the impact of such activity on heightening the physical and psychological health of the participant. Furthermore, Tinsley and Eldredge (1995) indicated participants' sense of psychological well-being from recreation increase with the perception that needs have been satisfied by the activity. Participation in recreation activities can improve recreationists' psychological well-being by meeting certain needs, such as acquisition of skill/knowledge or formation of social relations (Brajša-Žganec et al., 2012; Iwasaki & Smale, 1998). Based on the above, this study makes the following hypothesis:

Hypothesis 5: Psychological well-being increases with satisfaction

Studies have shown that flow experience can positively affect individual well-being (Asakawa, 2010; Wanner, Ladouceur, Auclair, & Vitaro, 2006). People who experience flow can gain joy from and fully immerse in the process of the activity, engendering positive feelings. Looking at participants in sports and games, Wanner et al. (2006) show that the dimensions of flow experience (including sense of passage of time and concentration) can positively affect the positive feelings associated with psychological well-being. They find that immersion in an activity can produce self-confidence in one's ability to control the overall progress of the activity and this creates the potential for greater psychological well-being. Wu and Liang (2011) further note that participants in certain activities (such as whitewater rafting) often become fully immersed in the activity to the point of obliviousness to the passage of time, resulting in pleasure, excitement, and other positive moods. Therefore, this study offers the following hypothesis:

Hypothesis 6: Psychological well-being increases with the flow experience

Methods

Conceptual Framework

Previous studies look at challenge in terms of activity attributes and treat challenge simply as one factor in the formation of the flow experience (Jones et al., 2000). This study, on the other

hand, treats challenge as an important experience in adventure recreation. It also attempts, from the perspective of personal experience (Barnett, 2005; Caldwell et al., 1992), to investigate challenge perception and its outcome among participants in the process of adventure recreation. Furthermore, since a causal relationship is likely to be present among these outcomes, this study also looks at the relationship among flow experience, satisfaction, and psychological well-being. The conceptual framework is shown in Figure 1.

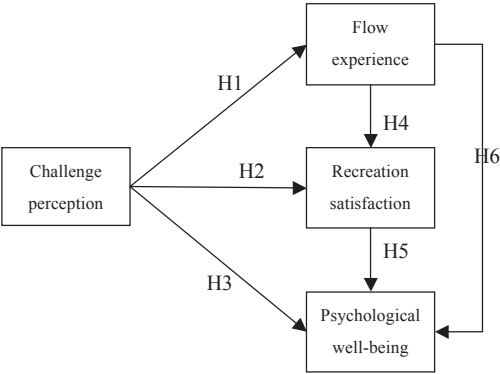


Figure 1. Conceptual Model

Sample Design and Data Collection

The subjects of this study were participants in adventure recreation. Samples were collected for three types of activities: scuba diving, high-altitude mountaineering, and whitewater rafting (Bentley, Page, & Laird, 2001). All samples were amalgamated for further analysis to increase the external validity of the results and generalize the model to other adventure activities.

Scuba diving. As an island, Taiwan is well suited for scuba diving activities. Kenting National Park, located in southern Taiwan, has the greatest abundance and variety of marine resources along the coast of Taiwan and is a popular spot for many foreign and domestic divers (Kenting National Park, 2001). This study conducted a field investigation on Houbihu, a popular diving location at Kenting National Park. Diving in this area is primarily guided. The average diving depth is 10–13m and the average diving time is 30–35 minutes.

High-altitude mountaineering. Taiwan has more than one hundred mountains with altitudes of 3,000 or more meters above sea level, including Yushan, the highest peak in Northeast Asia. Located in Yushan National Park, Yushan rises to an altitude of 3,952 meters. The mountaineering route to the highest peak of Yushan is popular with both locals and foreign visitors, attracting between 40,000 to 50,000 climbers each year. The questionnaires for this study were collected from this group. Visitors can climb individually or participate in itineraries planned by mountaineering associations. It takes at least two days to climb on the highest peak of Yushan, involves at least 10 hours of hiking, and requires some mountaineering skill. At night, climbers can camp on the mountain or stay in cabins.

Whitewater rafting. The Xiuguluan River in Hualien County is the origin of whitewater rafting in Taiwan and the most popular rafting spot for tourists. According to the Tourism Bureau of Taiwan, the American Whitewater Affiliation (AWA) has rated the Xiuguluan River as a

Class II river. However, the river has numerous strong rapids that make it comparable to a class 4 or 5 river. For safety reasons, private rafting is prohibited on the river. All trips must be commercially operated and accompanied by certified lifeguards. The rafts are paddleboats propelled by several passengers with instruction from a guide and require physical strength to operate. The rafting trip takes four to five hours, which includes navigating the rapids that are along the way.

Questionnaires were distributed based on convenience sampling. Recreation participants were asked to fill in the questionnaires at the end of the activity. Since most of the subjects participated in the activities with partners, in order to avoid sample errors caused by high degree of homogeneity, only one person per group was asked to answer the questionnaire. The reviewer asked the first member of the group encountered to fill in the questionnaire. The person sampled was also asked to identify fellow tour members to prevent their inclusion in the survey. A total of 350 samples were obtained for each activity. Nunnally (1978) suggested that in SEM estimation, "a good rule is to have at least ten times as many subjects as variables (p.421)." After eliminating incomplete questionnaire, a total of 949 valid questionnaires were obtained, representing a response rate of 90.4%.

Measurement

This study revised five items for measuring challenge perception based on Schmidt and Little (2007) and Weissinger and Bandalos (1995). The items were examined by two scholars for content validity. Content validity is defined as the degree to which a sample of items constitutes an adequate operational definition of a construct (Polit & Beck, 2006). Therefore, they are categorized according to degree of correspondence with the definition of challenge perception into three states: "clearly corresponding," "slightly corresponding," and "not clearly corresponding." Content validity has been achieved when all of the items were determined to be "clearly corresponding."

This study measured flow experience using the three items proposed by Han (1988), which contains three concepts: sense of control, focus, and sense of passage of time. Three items were used to assess overall recreation satisfaction in reference to Yoon and Uysal (2005). Finally, based on the positive affects scale proposed by Bradburn (1969), a total of five items were used to measure psychological well-being and assess individual inner health (Iwasaki & Smale, 1998). Each item used a five-point Likert scale scoring ranging from *strongly disagree* to *strongly agree*, with scores of one to five, accordingly.

Analysis and Results

Sample Characteristics

The sample comprised more male respondents (69.0%) than females. By age, the most represented group was 26 to 35 (38.1%), followed by 18 to 25 (25.9%), and 36 to 45 (16.5%). Nearly 80% (77.5%) of the respondents had at least a university/college level of education. There was a fairly even distribution by occupation, with students forming the largest group (22%), followed by professionals such as engineers, physicians, or lawyers (18.1%). The preponderance of males around the age of 30 is indicative of the physical strength required for participation in adventure recreation. The characteristics, such as gender or age of the sample in this study, were approximately the same as characteristics in previous research related to adventure recreation (Kyle, Bricker, Graefe, & Wickham, 2004; Thapa et al., 2006).

Measurement Model

In line with the two-step approach proposed by Anderson and Gerbing (1988), a measurement model was tested before testing the structural model. A confirmatory factor analysis was conducted to investigate measurement reliability and validity. The measurement model is detailed in Table 1. The goodness of fit index of the model is: χ^2/df ($df = 98$) = 4.3, GFI = 0.95, SRMR = 0.034, RMSEA = 0.059, CFI = 0.99, and PGFI = 0.68. These index values indicate that the measurement model has an acceptable model fit. Composite reliability (CR) is employed to corroborate internal consistency of measurement. As shown in Table 1, the CR of the all constructs range from 0.79 to 0.89. Most of the values are well above the recommended value of 0.7, indicating internal consistency among the measurements adopted by this study (Jöreskog & Sörbom, 1993).

Convergent validity is present when each indicator's estimated path coefficient mapping to potential constructs is statistically significant ($t > 1.96$) (Bagozzi, Yi, & Phillips, 1991). Convergent validity is also exhibited when the average variances extracted (AVE) from latent variables and their corresponding measurement items exceeds 0.50 (Fornell & Larcker, 1981). Table 1 shows that all items clearly ($p < 0.01$) fall within the construct with a path coefficient between 0.67 and 0.88. Furthermore, the AVE of each construct ranges between 0.55 and 0.66, indicating good convergent validity of the measurements in this study.

Discriminant validity refers to the variance in the measurement of different constructs. It is considered present if the square root of the construct AVE exceeds the correlation coefficient of the other construct (Fornell & Larcker, 1981). The correlation coefficients for all constructs are shown in Table 2. The minimum construct AVE square root value is 0.74, higher than largest correlation coefficient of 0.69 among constructs, indicating that the measurements adopted by this study have good discriminant validity.

Table 1
Confirmatory Factor Analysis of Constructs and Items

Constructs and Items	Factor loading	t-value	AVE	CR
Challenge perception			0.58	0.87
I can amply use my personal abilities.	0.74	25.57		
I need to involve in the activity with full attention.	0.77	26.78		
I am willing to accept the possible uncertainty.	0.73	24.87		
I feel challenging.	0.78	27.42		
I perceive novelty and excitement.	0.78	27.45		
Flow experience			0.55	0.79
I was very focused during the activity.	0.74	24.07		
I felt the time passed quickly during the activity.	0.76	24.96		
I was in control throughout the activity.	0.73	23.50		
Recreation satisfaction			0.66	0.85
Overall, the activity met my expectations.	0.83	29.90		
This activity was worth the time and energy spent.	0.76	26.25		
I am satisfied with the activity overall.	0.85	31.10		
Psychological well-being.			0.62	0.89
I feel on top of the world.	0.81	29.44		
I feel particularly excited and interested.	0.88	33.57		
I feel pleased about accomplishing something.	0.86	32.32		
I feel proud because someone complimented me on completing the activity	0.70	24.22		
Things went the way I had hoped.	0.67	22.55		

Table 2
Correlation Coefficient Matrix among Constructs

Construct	Challenge perception	Flow experience	Recreation Satisfaction	Psychological well-being
Challenge perception	0.76			
Flow experience	0.45**	0.74		
Recreation satisfaction	0.47**	0.44**	0.81	
Psychological well-being	0.48**	0.52**	0.69**	0.79

Note: The diagonal elements are the squared roots of the AVE. The off-diagonal elements are the correlations between the constructs (**p<0.01)

Structural Model

This study utilized maximum-likelihood estimation via LISREL 8 (Jöreskog & Sörbom, 1993) software to examine the hypothesized relationships. The results of hypothesis testing for this study are presented in Table 2. The overall goodness of fit index for the hypothesis model is: $\chi^2 = 421.48$, $df = 98$, $\chi^2/df = 4.3$, $GFI = 0.95$, $RMSEA = 0.059$, $SRMR = 0.034$, $CFI = 0.99$, $NFI = 0.98$, $PGFI = 0.68$, indicating that the structural model and data have a good fit.

First, challenge perception has a significant positive impact on flow experience ($\gamma = 0.55$, $p < 0.01$), satisfaction ($\gamma = 0.33$, $p < 0.01$), and psychological well-being ($\gamma = 0.07$, $p < 0.05$). Therefore, hypotheses 1, 2, and 3 are supported. Secondly, flow experience significantly and positively influence satisfaction ($\gamma = 0.36$, $p < 0.01$) and psychological well-being ($\gamma = 0.24$, $p < 0.01$), indicating that hypotheses 4 and 6 are supported. Finally, satisfaction has a significantly positive impact on psychological well-being ($\gamma = 0.62$, $p < 0.01$), supporting hypothesis 5. In this model, the variance of flow experience, satisfaction, and psychological well-being accounted for 30%, 47%, and 68% respectively.

There are direct and indirect relationships among challenge perception, satisfaction, and psychological well-being. As shown in Table 3, the direct effect of challenge perception on satisfaction is 0.33 and the indirect effect is 0.20. Overall effect is significant at 0.53. Direct effect of challenge perception on psychological well-being is lower at 0.07. However, indirect effect is 0.46. Total effect is 0.53 and it is significant ($p < 0.01$).

Table 3
Direct Effect, Indirect Effect, and Total Effect

Independent variable	Dependent variables		
	Flow experience	Recreation Satisfaction	Psychological well-being
<i>Challenge perception</i>			
Direct effect	0.55**	0.33**	0.07*
Indirect effect	–	0.20**	0.46**
Total effect	0.55**	0.53**	0.53**

Note: * p<0.05; **p<0.01

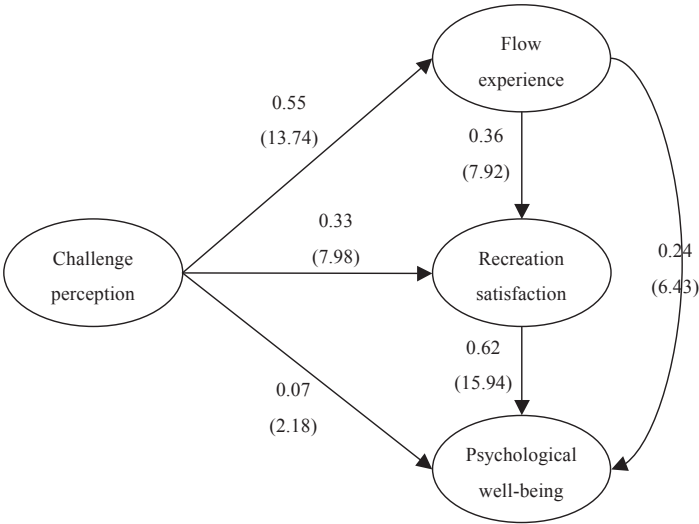


Figure 2. Path Analysis of the Structural Equation Model

Discussion

This study integrates samples from three adventure recreation activities to investigate the outcomes of challenge perception among participants. The model of challenge experience proposed by this study has not been examined in past research. The process of recreational experience among adventure participants can be more broadly understood by comprehensively examining the relationship among the variables in the challenge perceptual model. This study not only demonstrates that challenge perception has an impact on flow, satisfaction, and well-being, but also confirms the relationships among those outcome variables. The resultant findings contribute to the overall understanding of participating adventure activity. Firstly, research results show that perception of challenge can heighten flow experience, satisfaction, and psychological well-being in adventure recreationists. Ryan & Deci (2000) argued that action upon intrinsic motivation helps individual to perceive enjoyment and inherent satisfaction. The pursuit of challenge perception is an important intrinsic motivation for engaging in adventure recreation (Ewert & Hollenhorst, 1989; Lee et al., 2007). Therefore, realizing the motivation of seeking challenge is realized can produce the positive outcome of satisfaction.

Challenge perception is an important antecedent of flow experience: a finding that echoes previous studies (Jones et al., 2000; Wu & Liang, 2011). Compared to general outdoor activities, adventure recreation provides participants with more opportunity to perceive challenge. The greater the challenge perception, the more fully the participants need to dedicate their abilities and concentrate, leading to immersion in the activity, obliviousness to the passage of time, and a flow state. The perceived challenge exists in high-risk and high-competency situations. It means recreationists try to overcome various kinds of difficult situations by their competence in order to attain optimal arousal (Priest, 1992). Priest (1992) suggested that adventure recreationists would pursue the optimal arousal in order to have peak experience similar to flow experience. For example, a diver able to fully utilize his or her skills is more likely to fully enjoy the seascape view, completely focus on the present, and achieve a flow state.

The overall satisfaction of participants in adventure recreation is affected by challenge perception. The results of this study accord with theoretical expectations (Oliver, 1980) that satisfaction results when prior expectations of challenge are realized. In whitewater rafting, for example, challenge often is the main motivation for participation (Lee et al., 2007). Rafters feel stimulation and challenge from the activity and a sense of satisfaction from completing the task. Likewise, adventure recreationists seek adventure activities in fields suitable to testing their personal limits. When individuals perceive challenge, they are satisfied by demonstrating their skill. Challenge perception can also enhance the psychological well-being of recreation participants, although the degree of influence is far lower than that for flow experience and overall satisfaction. This finding mirrors the findings of Poon and Fung (2008), which believes that participation in more challenging physical activity can enhance psychological well-being. For example, high-altitude mountaineering often requires sustained hiking for over 10 hours, posing a major challenge for the climber both physically and emotionally. When the activity is completed, a climber is likely to feel pride and happiness in overcoming the challenge.

Finally, the relationships among flow, satisfaction, and well-being were verified. Previous studies have shown that flow experience affects satisfaction (Wanner et al., 2006; Wu & Liang, 2011). The greater the sense of flow, the more likely that participants in adventure recreation will have a positive assessment of the activity outcome and believe that participation in the activity was worthwhile and consistent with their expectations. For example, the majority of whitewater rafters who feel the rapid passage of time and active absorption during a rafting course feel pleasure and satisfaction in the activity. Secondly, this study corroborates the finding of previous studies (Wanner et al., 2006) that flow experience is conducive to improving psychological well-being. For example, scuba diving is challenging due to professional knowledge and skill required to complete the dive. Divers who achieve a flow state and immerse entirely in the activity feel a sense of pleasure both during and after the activity. Finally, the impact of satisfaction on psychological well-being echoes Staempfli (2007), who finds that the satisfaction of an individual's needs can enhance physical and psychological health. For example, climbers are likely to feel joy and pride from achieving the objective of the challenge (i.e., reaching the mountain peak and enjoying the view).

Implications and Suggestions

Diving, mountaineering, and rafting are popular adventure recreational activities in Taiwan, with many companies planning and operating related activities. The results of this study therefore have significant management implications. Participant satisfaction is a major objective of recreation operators, and participants hope to derive pleasure, happiness, and other positive feelings from recreation activities. This study confirms that challenge perception is an important antecedent in the formation of the positive outcomes of flow state, satisfaction, psychological well-being among participants in adventure recreation. Tour planners would therefore be well advised to consider whether the element of challenge is included in their adventure recreation packages, and to attempt to provide, within safe limits, opportunities for participants to experience challenge to the extent possible. Furthermore, since flow can result in a sense of satisfaction and happiness, operators should help each participant to achieve a flow state. Tour guides and trainers should regularly note the physical and psychological state of each participant and provide due assistance to help them achieve a flow state.

The following limitations and suggestions apply to the findings of this study. First, although the study looks at three different activities, there are numerous types of adventure activities and

the generalizability of the results should therefore be considered with prudence. Future studies could obtain samples from other types of activity to augment the generalizability of the results. Secondly, although care was taken in the collection of data for the study, there remains the possibility of response error from factors such as social desirability and common method variance. Since the questionnaire involved a satisfaction survey, the responses obtained may have been affected by bias toward operator expectations. It is therefore proposed that future studies include social desirability variables to examine whether or not there is bias in the results, as well as use multiple data sources to reduce the problem of common method variance. Thirdly, this study rationalized the model of challenge perception as a linear network based on past theory. However, this model potentially exists in non-linear relationships. Future research can adopt non-linear analysis to test the model of challenge perception from a different perspective. Finally, future studies can extend the theoretical model of this study to further investigate the formative elements of challenge and the other outcomes of challenge perception. Such studies would have significant benefits for theoretical development in the field of adventure recreation.

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An Alternate Conceptualization of the Leisure Constraints Measurement Model

Formative Structure?

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Abstract

In this paper, we question researchers' assumption that the leisure constraints measurement model holds reflective structure and offer an alternative conceptualization consistent with the structure of constraints indicators. We contend that constraints indicators follow a formative structure and that reflective specifications violate the psychometric assumptions underlying the common factors model. After clarifying conceptual distinctions governing formative and reflective measurement, we then offer an empirical example to demonstrate its application and present several guiding criteria for developing and assessing formative indices. By improving our ability to correctly model the constraints measurement model, formative specifications have the potential to resolve a number of confounding measurement issues, advance our understanding of leisure constraint and negotiation processes, and enhance delivery of leisure services.

Keywords: *leisure constraints, formative measurement, structural equation modeling*

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A Problem Exists

Several years ago, Godbey, Crawford, and Shen (2010) provided a thorough review of leisure constraint research conducted over the past two decades adopting the hierarchical model of constraints. The model, originally proposed by Crawford and colleagues (Crawford & Godbey, 1987; Crawford, Jackson, & Godbey, 1991; Jackson, Crawford, & Godbey, 1993), consists of three broad classifications of leisure constraints arranged hierarchically; intrapersonal, interpersonal, and structural. They hypothesized that constraints are experienced sequentially such that eventual leisure behavior is dependent on the successful negotiation of each form of constraint beginning with factors most proximal to the individual (i.e., intrapersonal) to those most distal (i.e., structural). In Godbey et al.'s review, they highlight a variety of issues with which researchers have struggled and provide instructive direction for future research. An issue raised in their review, and the focus of this paper, relates to the assumptions underlying the conceptualization and analyses of constraint measures. Godbey et al.'s discussion highlights concern with the performance of existing constraints scales, noting weak factor loadings and scale reliability. These measurement issues also raise concern over the validity of the dimensional structure of constraints and, ultimately, their hypothesis relating to hierarchical processes.

It is our contention that both their tripartite model and most associated measures are adequate. Rather, the problem lies in authors' conceptualization of the measurement model. Leisure researchers have assumed measures of constraints follow a reflective form where variation in the manifest indicators is accounted for by their latent domain (i.e., the dimensions of constraints). However, we contend that constraint measures more closely approximate the form of what Bollen and Lennox (1991) refer to as "formative indicators" (also referred to as "composite cause" or "cause indicators"; Brown, 2006). Rather than reflecting the latent construct, formative indicators "cause" the latent factor (Bollen & Lennox, 1991; Fornell & Bookstein, 1982). As such, analytical techniques that are more consistent with procedures underlying index construction, as opposed to scale development, are most appropriate (Bollen & Lennox, 1991; Diamantopoulos & Winklhofer, 2001).

The choice of a formative versus a reflective measurement model is driven by the causal priority between the indicator and the latent variable (Bollen, 1989). For reflective models, directionality (see Panel 1, Figure 1) emanates from latent construct to the observed measure. This is based on the assumption that the individuals' responses to the measures are thought to vary as a function of the latent variable (Borsboom, Mellenbergh, & van Heerden, 2004). In this sense, the measures are thought to share a common cause. Alternately, for formative models, the reverse is true; causality flows from the indicator to the latent construct (see Panel 2, Figure 1). In this case, because the latent construct is conceived as an explanatory combination of its indicators, changes in the indicators give rise to changes in the latent construct (Fornell & Bookstein, 1982).

When considering the dimensions of constraints and their accompanying measures, it becomes immediately apparent why a reflective conceptualization is problematic – both conceptually and empirically. For example, authors' measures of structural constraints often include items referencing crowded settings, access to transportation, financial resources, convenience, knowledge of services available, other commitments, and time deficit (e.g., Hawkins, Peng, Hsieh, & Eklund, 1999; Nyaupane & Andereck, 2008; Nyaupane, Morais, & Graefe, 2004; Walker, Jackson, & Deng, 2007; Raymore, Godbey, Crawford, & von Eye, 1993). In this context, it is difficult to imagine that the variation in each of the indicators emanates from a single latent construct. That is, the variation in respondent's perceptions of setting density (crowding) is likely to be indepen-

dent of their financial resources; or their access to transportation is not likely to be tied to their work or personal commitments. Thus, the assumptions underlying reflective models are incongruent with current conceptualizations and measures of the tripartite leisure constraints model.

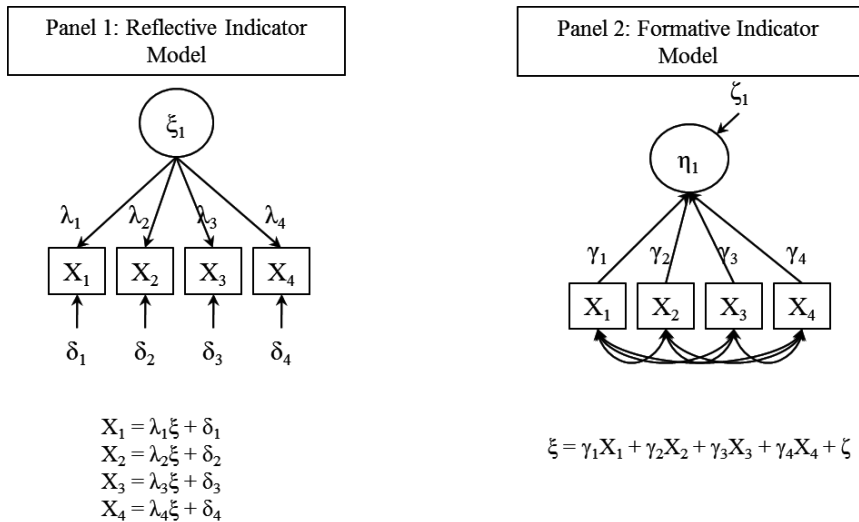


Figure 1. Reflective and Formative Measurement Models

With this in mind, the purpose of the paper is to present an alternative approach for conceptualizing leisure constraint measurement models that enables researchers to move beyond these existing measurement conundrums. We begin by providing insight on the theoretical background underlying the development of formative indicators and metrics for their assessment. Using an exemplar drawn from the literature, we also draw parallels to contemporary measures of leisure constraints and highlight shortcomings of existing analytical procedures that assess their psychometric properties. We then provide an empirical example demonstrating alternate analytical procedures for testing formative models using data from one of our previous investigations. We conclude with a reiteration of the need to revisit conceptualization of the leisure constraints measurement model, and its implications for both leisure research and practice.

Why the Problem Exists: Reflective and Formative Measurement

Conceptual Distinctions

A great deal of attention has been devoted to developing measures of various leisure phenomena (e.g., motivation, specialization, enduring involvement, place attachment, commitment, etc.) with sound psychometric properties over the last 30 years. The advent of structural equation modeling techniques has also further facilitated the use and assessment of multi-item scales. Because many aspects of leisure are assumed latent, particularly those related to individuals' thoughts and feelings about leisure and the contexts in which it is experienced, efforts to measure these phenomena have relied on multi-item scales which are considered to have superior validity and reliability. Researchers studying leisure constraints have continued this line

of thinking. Following a tradition in quantitative social psychology and in accordance with classical test theory (Lord & Novick, 1968), they have almost exclusively conceptualized the leisure constraints measurement model to be reflective (see Panel 1 in Figure 1). In so doing, several key assumptions are made. First, as noted, the direction of causality trails from the latent construct to the measured indicator. As such, variation in the latent variable precedes variation in the indicators (see equations in Panel 1, Figure 1). Consequently, the indicators ought to share a common theme and are interchangeable. This interchangeability, theoretically, enables researchers to measure a specific construct by sampling a few relevant indicators of the domain underlying the construct (Churchill, 1979; Nunnally & Bernstein, 1994). Inclusion or exclusion of one or more indicators from the domain does not materially alter the content or validity of the construct (Bollen, 1989). Because the indicators share a common theme, they are also assumed to be strongly and positively correlated (Brown, 2006). Last, it is also assumed that given the items share a common theme, it is assumed that they will have the same antecedents and consequences (Cenfetelli & Bassellier, 2009).

Alternately, for formative measurement models where the indicators define the construct, directionality flows from the measured items to the latent construct (Bollen & Lennox, 1991; see Panel 2, Figure 1). Unlike the reflective model, this model does not assume that the measures are caused by a single underlying construct. Rather, it assumes that the measures have an impact *on* the construct. As such, no assumptions are made of inter-item collinearity. In fact, Jarvis, MacKenzie, and Podsakoff (2003, p. 202) have suggested that it would be “entirely consistent for formative indicators to be completely uncorrelated.” Given this, measures of internal consistency reliability are not appropriate (Bollen & Lennox, 1991). Also, the consequences of dropping one of the indicators are potentially serious. Decisions guiding the selection of items should best attempt to capture the domain of interest (Coltman, Devinney, Midgley, & Venaik, 2008; Rossiter, 2002). Thus, dropping a causal indicator has the potential to omit an important element of the composite latent construct and change the meaning of the variable. Finally, formative indicators have the same antecedents and consequences (Cenfetelli & Bassellier, 2009). Referring back to the measures often used for structural constraints noted in the introduction (e.g., crowded settings, access to transportation, financial resources), it is unlikely factors influencing people’s perceptions of setting density would also drive their access to transport or financial resources. Similar, the extent to which they impact people’s preference and access to leisure is not likely uniform.

Thus, Table 1 provides a summary of the distinguishing characteristics of formative and reflective measurement models discussed above. Given these distinctions, a construct should be modeled as having formative structure if the indicators manifest the following conditions (Bollen & Lennox, 1991; Jarvis et al., 2003): (a) indicators are viewed as defining characteristics of the construct, (b) changes in the indicators will result in changes in the construct, (c) changes in the construct are not expected to cause changes in the indicators, (d) the indicators do not share a common them, (e) removing an indicator can change the conceptual meaning of the construct, (f) a change in the value of one of the indicators is not assumed to be associated with changes in other indicators from the same domain, and (g) the indicators are not assumed to have the same antecedents and consequences.

The Issue of Psychometric Assessment

The conceptual distinctions outlined above have empirical implications that also inform our understanding of the measurement model. Where procedures for assessing reflective indicator scales have been around for over 100 years (Spearman, 1904) along with other complimentary psychometric assessments, formative indicator models have a comparatively brief history.

Table 1*Summary: Framework for Assessing Reflective and Formative Models*

Considerations	Reflective Model	Formative Model
Direction of causality	From the construct to the indicators Variation in the construct causes variation in the indicators	From the indicators to the construct Variation in the indicators causes variation in the construct
Characteristics of indicators used to measure the construct	Indicators are manifested by the construct - Indicators share a common theme - Indicators are interchangeable - Adding/dropping an indicator does not change the meaning of the construct	Indicators define the construct - Indicators share a common theme - Indicators not interchangeable - Adding/dropping an indicator can change the meaning of the construct
Indicator intercorrelations	Indicator should have high positive intercorrelation Measures should possess internal consistency reliability	Indicators should share the same valence with little covariation Internal consistency not a consideration
Nomological net of construct indicators	Indicators expected to have the same antecedents and consequences	Indicators not expected to have the same antecedents and consequences

While growing in popularity in business, marketing, and organizational behavior research (for reviews, see Diamantopoulos et al., 2008; Diamantopoulos & Winklhofer, 2001; Jarvis et al., 2003), they have yet to appear in the leisure literature. From this developing literature, several authors have begun to make recommendations on potential metrics for assessment (Diamantopoulos et al., 2008; MacKenzie, Podsakoff, & Podsakoff, 2011) while others have rejected these metrics claiming that assessments of validity and reliability are inappropriate.

Suggestions for potential reliability assessment with formative indicators include test-retest (DeVillis, 2003) or correlating indicators with an alternate measure of the focal construct (MacKenzie et al., 2005). Alternately, for validity, Bollen (1989) has suggested examining that the γ -parameters that reflect the effect of the formative indicators on the latent construct. A significant effect implies item-level validity. Similarly, at the construct level, several authors have also suggested examining the constructs' effect on theoretically relevant outcomes (Bollen & Lennox, 1991; Diamantopoulos et al., 2008). In this case, validity would be demonstrated through statistically significant prediction.

Authors who resist the use of quantitative assessments of validity and reliability for formative indicators typically cite the measures' lack of covariation that undermines assessment of internal consistency and convergent validity (Rossiter, 2002; Straub, Boudreau, & Gefen, 2004). For constraints indicators, we cite two other pragmatic concerns that warrant consideration. For reflective indicators that comprise a scale designed to measure a particular latent phenomena, establishing validity and reliability is considered an important goal. This allows the researcher to measure the particular phenomena across a range of contexts, populations, and time. For constraints indicators, however, the development of a valid and reliable scale that transcends context makes little conceptual sense. Given that the constraints to leisure (and just about any behavior for that matter) are influenced by a range of factors (e.g., gender, race, ethnicity, lifecycle, time

period), it is unlikely that a single universal scale could be developed to reasonably be administered in the field. Consequently, researchers often draw from the pool of items available in the literature and/or develop their own context-specific items. Arguments for the use of generic indicators with a history of solid psychometric performance have the potential to miss the salient constraints relevant to the population of interest.

Another concern relates to the potential exclusion of an item owing to a low factor loading and/or its influence on a dimension's internal consistency. Given both factor loadings and internal consistency are driven by the covariance structure among a set of indicators (Brown, 2006) there is potential to exclude items not because of the degree to which they reflect a salient constraint but, rather, because of how well they relate to other items within the particular dimension. Consequently, in the context formative measurement, use of the pillars of psychometric assessment that govern the performance of reflective scales has potential to guide the researcher in directions detrimental to their research objectives.

An Exemplar Taken from the Literature

To provide an example of the issues associated with considering constraints indicators as reflective, we drew on Raymore et al.'s (1993) study of leisure constraints among high school children using the hierarchical model. From the outset, we emphasize that our critique is not directed toward the quality of their research, the conceptual foundations underlying the hierarchical model, or even the indicators themselves. Our concern lies with their conceptualization of the measurement model, the associated analysis, and metrics used to evaluate the model. While it could be considered unfair to apply contemporary understandings of empirical adequacy to analyses conducted over 20 years prior, the issue remains prevalent in the literature (see Casper, Bocarro, Kanters, & Floyd, 2011; Hawkins et al., 1999; Hubbard & Mannell, 2001; Jun & Kyle, 2011; Nyaupane & Andereck, 2008; Nyaupane et al., 2004; Walker et al., 2007) and, to date, has not been questioned. We choose Raymore et al.'s paper to focus our discussion largely due to several authors pointing to this work as "validating" the hierarchical model (Godbey et al., 2010; Mannell & Iwasaki, 2005). We contend that incorrect assumptions concerning the nature of the measures and the resulting empirical evidence undermines such claims.

Beginning with empirical evidence, the data presented in Table 2 contains the observed measures, factor solution, and composite reliabilities¹ reported by Raymore et al. (1993, p. 106). First, with regard to the strength of the factor loadings, one can see the values are conspicuously low. While Raymore et al. report that their model fit the data well (e.g., GFI=.938, RMSR=.054), establishing model fit is a necessary but insufficient condition for evaluating the plausibility of the measurement model (Brown, 2006). In reviews of the business and organizational behavior literatures conducted by Diamantopoulos, Riefler, and Roth (2008) and MacKenzie, Podsakoff, and Jarvis (2005), they reported that model fit indices (e.g., CFI, GFI, SRMR and RMSEA) can fail to detect model misspecification. Consideration of parameter estimates is also required to provide substantive evidence in support (or lack) of the hypothesis being tested (i.e., the three-dimensional structure is a valid representation of leisure constraints). Raymore et al. established that the predicted variance/covariance matrix (Σ) adequately resembled the sample variance/covariance matrix (S), but it did not substantively address concern over what is being measured. The issue is intimately tied to construct validity; i.e., what is the relationship between the observed indicator and the latent construct for which it was designed to reflect. Factor loadings

¹Raymore et al. (1993) did not report composite reliabilities in their original work. We derived these from their reported factor loadings and calculated using Raykov's (1997) procedure.

provide empirical evidence of this association (Brown, 2006). At a more stringent level, Fornell and Larcker (1981) have suggested that latent constructs failing to capture at least 50% of the variance in their manifest indicators are questionable. This requires factor solutions generating loadings equal to or greater than .708 (i.e., $.708^2 = .5$). As displayed in Table 2, no loading approaches this value with the highest value being .595. While we think most would agree that the Fornell and Larcker cut-off is a very (perhaps overly) demanding requirement of data collected outside of a laboratory environment, concern remains even when applying more relaxed tolerances. In the context of applied research, Hair, Anderson, Tatham, and Black (1998, p. 111) noted that “factor loadings greater than ± 0.30 are considered to meet the minimum level; loadings of ± 0.40 are considered more important; and if the loadings are ± 0.50 or greater, they are considered practically significant.” Thus, while four of Raymore et al.’s 21 items were below the .3 cutoff suggested by Hair et al., more troubling is that only two items had loadings above .5. Raymore et al. defend their decision of retaining items with small loadings because of their significant *t*-values². Several authors, however, have noted that significance even for low loadings can be achieved owing to sample size (Byrne, 1998; Cudeck & O’Dell, 1994). With an *N* of 363 responses, this appears to be the case.

Other empirical concerns over construct validity stemming from Raymore et al.’s (1993) factor solution are also reflected in the average variance extracted (AVE; Fornell & Larcker, 1981) which we calculated for each dimension of constraints. Fornell and Larcker’s AVE measures the amount of variance captured by a latent construct with values of .5 and higher providing evidence of convergent validity. As displayed in Table 2, all three AVEs for the constraint dimensions are equal to or less than .30. Last, while the composite reliability (i.e., measure of scale reliability) estimates approach the acceptable threshold value of .7 (Hair et al., 1998), their values are being inflated by the number of items loading on each factor (Raykov & Marcoulides, 2011). For example, the removal of the two weakest items (X_3 & X_5) loading on the “intrapersonal” dimension lowers the composite reliability from .74 to .62. The same issues are evidenced in each of the other dimensions.

This example illustrates that when evaluating the Raymore et al. (1993) and subsequent published leisure constraints measurement models using the rubric accompanying reflective measurement, a number of questions can be posed concerning the adequacy of the measures. For researchers who report the solutions of their measurement models (and many don’t), use of the previously discussed indicators of validity (e.g., strength of factor loadings, inter-item correlations, AVE) and reliability (e.g., composite reliability) provide limited empirical evidence in support of the dimensional structure of leisure constraints. The root of these empirical conundrums can be traced back to model misspecification; (a) indicators don’t share a common theme, (b) construct does not account for variation in the indicators, (c) indicators are not correlated, and (d) indicators are not likely to share the same antecedents (e.g., factors influencing perceptions of crowding are not likely to influence respondents’ access to money) or outcomes. In the following section we provide an empirical illustration for testing a formative measurement model in comparison to reflective models using data collected by the first author.

²T-values test the H_0 that parameter estimate equals 0. Values ≥ 1.96 allow the researcher to reject the H_0 .

Table 2

Raymore et al. (1993) Factor Loadings and Factor Correlations

Intrapersonal ($\rho_{xx}=.74$; AVE=.30)		λ	λ^2	δ
Y ₁	I'm too shy to start a new leisure activity	.331	.110	.890
Y ₂	I am more likely to start a new leisure activity that my family would think is alright	.479	.229	.771
Y ₃	I am unlikely to do a new leisure activity that makes me feel uncomfortable	.292	.085	.915
Y ₄	I am more likely to do a new leisure activity that my friends thought was alright	.415	.172	.828
Y ₅	I am more likely to do a new leisure activity that is in keeping with my religious beliefs	.307	.094	.906
Y ₆	I am more likely to do a new activity that doesn't make me feel self-conscious	.541	.293	.707
Y ₇	I am more likely to do a new leisure activity that doesn't require a lot of skill	.347	.120	.880
Interpersonal ($\rho_{xx}=.68$; AVE=.28)				
Y ₈	The people I know live too far away to start a new leisure activity with me	.498	.248	.752
Y ₉	The people I know usually don't have enough time to start a new leisure activity with me	.428	.183	.817
Y ₁₀	The people I know usually have enough money to begin a new leisure activity with me	.023*	.001	.999
Y ₁₁	The people I know usually have too many family obligations to start a new leisure activity with me	.349	.122	.878
Y ₁₂	The people I know usually know what new leisure activities they could do with me	.152	.023	.977
Y ₁₃	The people I know usually don't have enough skills to start a new leisure activity with me	.280	.078	.922
Y ₁₄	The people I know usually don't have transportation to get to a new leisure activity with me	.595	.354	.646
Structural ($\rho_{xx}=.69$; AVE=.26)				
Y ₁₅	I am more likely to do a new leisure activity if the facilities I need to do the activity are not crowded	.470	.221	.779
Y ₁₆	I am unlikely to do a new leisure activity if I have other commitments	.165	.027	.973
Y ₁₇	I am more likely to do a new leisure activity if I have transportation	.430	.185	.815
Y ₁₈	I am more likely to do a new leisure activity if I know what is available	.319	.102	.898
Y ₁₉	I am unlikely to do a new leisure activity if the facilities I need to do the activity aren't convenient	.456	.208	.792
Y ₂₀	I am unlikely to do a new leisure activity if I don't have time	.263	.069	.931
Y ₂₁	I am more likely to do a new leisure activity if I have money	.326	.106	.894
Latent Factor Correlations		ρ		
Intrapersonal ↔ Interpersonal		.420		
Intrapersonal ↔ Structural		.693		
Structural ↔ Interpersonal		.695		

* Not statistically significant at $p < .05$

An Empirical Application

Context and Data

The data we used was collected in 2002 from subscribers to Cleveland Metroparks' *Emerald Necklace* publication. For greater detail on the study context and the population from which the sample were drawn, we direct readers to Kyle, Mowen, and Tarrant (2004). Survey instruments were distributed using a modified Dillman (2000) procedure which yielded 860 completed survey instruments (a 57.3% response rate).

Scale Development

While the constraint indicators were not explicitly developed with the principles of formative measurement in mind, our intent at the time was to develop a battery of items that covered the breadth of constraints that could potentially inhibit access to Cleveland Metroparks' services and facilities. The protocols we used to develop the constraint scale were consistent with criteria outlined by Diamantopoulos and Winklhofer (2001). The first step involved establishing content specification, which centers on the definition of the latent construct. This is also intimately tied to indicator specification (i.e., what indicators should be used to measure the construct) (Nunnally & Bernstein, 1994). In the context of the dimensions of constraints, while their definitions transcend context, the constraint indicators often vary across activities and populations (Godbey et al., 2010). Appropriately, leisure researchers have tended to develop indicators that are sensitive to issues confronted by specific populations in addition to those constraints endemic to the activity. While dimensionality has been a contentious issue within constraints research (Auster, 2001; Godbey et al., 2010; Shaw & Henderson, 2005), for the purpose of this illustration, we make the assumption that the definitions of the dimensions (intrapersonal, interpersonal, and structural) are narrow and unambiguous while reflective of the phenomena. The classification of the indicators into the constraint domains was comparable to past work (Raymore et al., 1993).

The second step relates to indicator specification. Unlike reflective indicators where a set of items are "chosen randomly from the universe of items relating to the construct of interest" (DeVillis, 1991, p. 55), a census of indicators is required for a formative specification (Bollen & Lennox, 1991). This implies that the items used as indicators must cover the entire scope of the latent variable as reflected in its definition. In the context of constraints measurement, indicators should accurately capture the breadth of constraints faced by populations of interest relative to the activity of interest. This does not mean that index purification is not possible through the removal of items. Rather, it stresses the need to select indicators that sufficiently capture the construct's domain content. Our goal was to include items that best reflected the most salient factors constraining Cleveland residents' access to Cleveland Metroparks facilities and services. Consequently, the constraints items were adapted from earlier studies in addition to consultation with staff from Cleveland Metroparks (Buchanan & Allen, 1985; McGuire, 1984) and consisted of 19 items; five measuring intrapersonal constraints, three measuring interpersonal constraints, and 11 measuring structural constraints. The items were prefaced with a question asking respondents to indicate if they felt they visited Cleveland Metroparks as often as they would like; 63.4% indicated "no." Respondents were then requested to indicate the extent to which the 19 items reflected reasons for not visiting as often as they would like. Items' measurement anchors were "not a reason" (1) through "major reason" (5).

Modeling and Identification

The issue of model identification is especially important for formative models (Diamantopoulos & Winklhofer, 2001) and has some bearing on our choice of measures and the models that we choose to estimate. As with all structural equation models, the ability to estimate parameters is dependent on having sufficient information to be able to solve each of the equations (i.e., the number of unknowns not exceeding the number of knowns) (Brown, 2006). The knowns refer to elements of the input matrix to be analyzed and unknowns refer to the parameters to be estimated. Reflective measurement models with at least three indicators (or two indicators if correlated with another latent factor comprised of two or more indicators) are algebraically identified; six parameters to be estimated (three factor loadings and three error variances) and six input elements (three variances and three covariances). Measurement models consisting solely of formative indicators like the one displayed in Panel 1 of Figure 2, however, are not identified. MacCallum and Brown (1993) have indicated that many identification problems of formative indicator constructs stem from indeterminacies associated with the scale of measurement and the construct-level error term (i.e., the ζ s in Figure 2). For scaling, Edwards (2001), advised standardizing the formatively measured construct by fixing its variance to unity given that fixing path parameters precludes estimating standard errors of theoretically interesting relationships. Additionally, for identifying the construct-level error term, three approaches have been broadly applied (Diamantopoulos et al., 2008); (a) add at least two unrelated reflectively-measured constructs as outcome variables (Panel 2 in Figure 2), (b) adding two theoretically appropriate reflective indicators to the formatively measured construct (Panel 3 in Figure 2), or (c) a mixture of these two approaches that would include a single reflective indicator and a reflectively-measured construct as an outcome variable (Panel 4 in Figure 2).

Beyond fixing the variance of the dimensions of constraints to unity, we chose to estimate a model conceptually similar to that displayed in Panel 2 of Figure 2. Our decision to test a model of this form was driven by the absence of single reflective indicators of the constraint dimensions. No such indicators were included on the instrument. The model we tested, displayed in Figure 3, has the three dimensions of constraints predicting four dimensions of place attachment (Williams & Roggenbuck, 1989; Kyle, Graefe & Manning, 2005; Jorgensen & Stedman, 2001). Place attachment was comprised of four reflective dimensions measured with 16 items: (1) place dependence—examines the functional utility people ascribe to place based on the setting's ability to support desired outcomes (Stokols & Schumaker, 1981); (2) affective attachment—reflects people's emotional ties to the physical environment (Low & Altman, 1992); (3) social bonding—the social ties that bind people to place (Low & Altman, 1992); and (4) place identity—the extent to which the self is imbedded in the landscape (Proshansky, 1978). Building from past work demonstrating an association between place interaction and place attachment (Hidalgo & Hernandez, 2001), we anticipated that those least constrained would express strongest attachment to Cleveland Metroparks setting and facilities.

Analyses

We analyzed the data using LISREL (V8.8). The pattern of missing data followed a missing completely at random distribution (MCAR). Multiple imputation was used to impute missing values in PRELIS (11%; Little & Rubin, 2002). An examination of normality revealed a mild departure from normality. In response, we chose to use the Satorra-Bentler scaled χ^2 (Satorra & Bentler, 1988) to evaluate the fit of the measurement models; both reflective and formative.

While partial least squares (PLS) approaches to estimating formative models are prevalent in the literature, our decision to test the hypothesized model using a covariance-based (CB)

estimation procedure was driven by the approach's ability to account for error. In PLS, the focal construct (η) is assumed to be fully determined by its indicators (Centefelti & Basselier, 2009; Diamantopoulos, 2011). That is, the variance of the disturbance term (ζ) is assumed to be zero. This assumption makes the overall assessment of the formative measurement model problematic given that it is not possible to evaluate how well the indicators collectively function in explaining the construct (Williams, Edwards & Vandenberg, 2003). Covariance-based procedures also provide the user with an assessment of overall model fit. This allows the researcher to determine the extent to which the hypothesized model fits the collected data and to compare against potential competing explanations (Henseler, Ringle, & Sinkovics, 2009). Last, CB software such as LISREL also offer a number of diagnostics (e.g., modification indices and expected parameter changes) which can assist with model respecification.

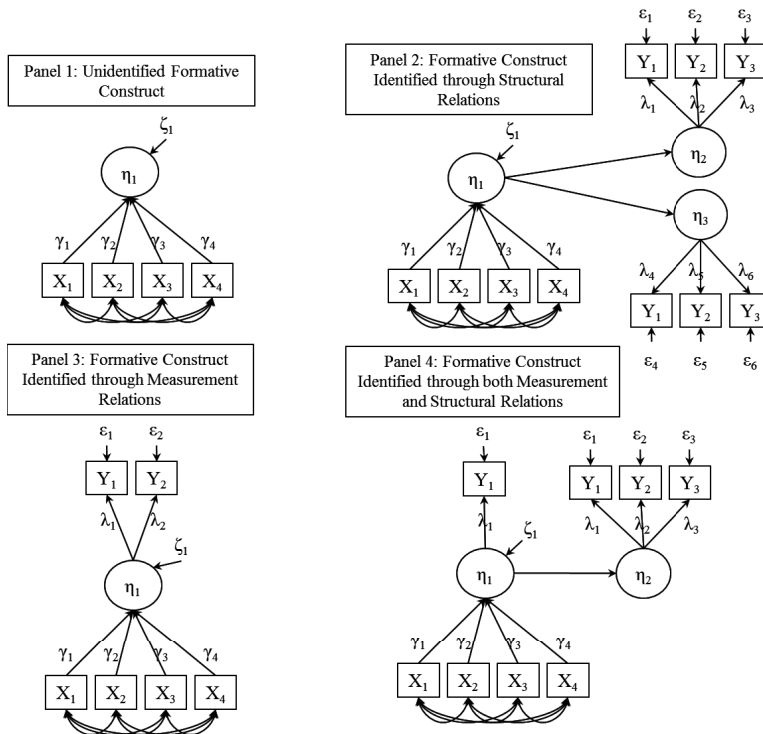


Figure 2. Assessing Identification Status (Adapted from Jarvis et al., 2003)

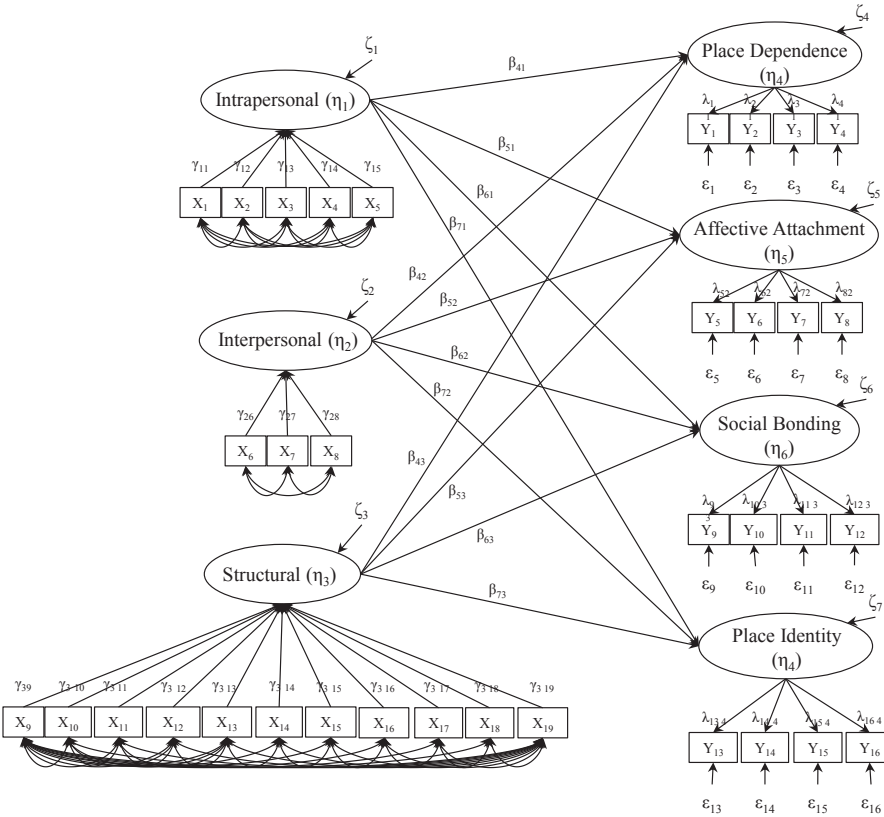


Figure 3. Formative Structural Model

Assessing the Reflective Conceptualization

Before testing the formative measurement model, for comparison, we also tested a reflective conceptualization of the constraints measurement model. The confirmatory factor solution is displayed in Table 3. Beyond a poor fit to the data ($SB\chi^2_{(df=149)}=2737.360$, $RMSEA=.163$, $NNFI=.688$, $NFI=.718$, $CFI=.728$), 10 of 19 loadings fell below .40; indicating that the dimensions of constraints were accounting for less than 16% of the variation in each of these indicators. Typically, the next step in the analysis would be to parse poorly performing items (i.e., items with low factor loadings; see Hair et al.'s [1998] criteria noted above) and rerun with the goal of arriving at a well-fitting and parsimonious model. As noted, however, the removal of items has potential to remove important factors that may constrain leisure preference and engagement. While factor loadings provide insight on the relationship between the indicator and its latent construct, it does not provide an assessment of the degree to which individual constraint indicators could be relevant factors inhibiting the leisure experience. Thus, like the exemplar we discussed earlier, model misspecification is evidenced in the fit indices and parameter estimates. This misspecification is directly attributable to the criteria outlined in Table 1.

Table 3*Leisure Constraints Reflective Measurement Model*

Intrapersonal ($\rho_{xx}=.60$; AVE=.25)		λ	t	λ^2	ϵ
Y ₁	Poor health	.242	-	.059	.941
Y ₂	Fear of crime	.314	4.980***	.099	.901
Y ₃	Not at ease in social situation	.435	5.531***	.189	.811
Y ₄	Pursue recreation in areas other than parks	.637	5.924***	.406	.594
Y ₅	Don't like to participate in nature or outdoor recreation activities	.380	5.327***	.144	.856
Interpersonal ($\rho_{xx}=.57$; AVE=.31)					
Y ₆	No one to go with to parks	.498	-	.248	.752
Y ₇	Friends/family prefer to recreate elsewhere	.525	11.521***	.276	.724
Y ₈	Conflicting schedules with my spouse/companion	.636	12.879***	.404	.596
Structural ($\rho_{xx}=.91$; AVE=.59)					
Y ₉	The lack of information about existing parks and park programs in Northeast Ohio	.209	-	.044	.956
Y ₁₀	The lack of time	.787	5.761***	.619	.381
Y ₁₁	Work commitments	.700	5.710***	.490	.510
Y ₁₂	Parks are too far away	.261	4.587***	.068	.932
Y ₁₃	I have no way to get to parks	.122	2.916**	.015	.985
Y ₁₄	Park facilities and programs cost too much	.367	4.249***	.135	.865
Y ₁₅	Parks and facilities are too crowded	.302	5.143***	.091	.909
Y ₁₆	Parks and facilities are over-developed	.805	4.851***	.648	.352
Y ₁₇	Too busy with other activities	.742	5.770***	.551	.449
Y ₁₈	Too busy with family responsibilities	.105	5.737***	.011	.989
Y ₁₉	Lack of transportation	.209	2.596**	.044	.956
Latent Factor Correlations		r			
Intrapersonal ↔ Interpersonal		.813			
Intrapersonal ↔ Structural		.660			
Structural ↔ Interpersonal		.753			

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

Goodness of fit indices: $SB\chi^2_{(df=149)}=2737.360$, RMSEA=.163, NNFI=.688, NFI=.718, CFI=.728

The Formative Conceptualization

Before testing the formative measurement model, we examined the indicators' collinearity using the indicators' variation inflation factor scores (VIF; Diamantopoulos et al., 2008; Götz & Liehr-Gobbers, 2004). As we noted earlier, excessive collinearity is undesirable in formative models. The highest correlation we observed was $r=.784$ among two structural constraint indicators: "I have no way to get to parks" and "parks are too far away." We then regressed the two structural constraint indicators on a measure of visitation over the preceding 12 months (in SPSS). The analysis produced a VIF of 2.48; a value well below threshold of 10 that Hair et al. (1998) indicated problematic. Most other items were weakly correlated.

For the formative measurement model, the analysis illustrated that model fit the data well (see bottom of Table 4: $SB\chi^2_{(df=309)}=733.356$, RMSEA=.040, NNFI=.971, NFI=.972, CFI=.983) demonstrating adequate congruence between the observed data and the values expected under the model tested. For the individual parameter estimates, six of the 19 indicators had a significant influence on the endogenous constraint dimensions. For intrapersonal constraints, significant predictors were constraints related to health (X_2 , $\gamma=.394$, $p<.01$) and preference for other settings (X_4 , $\gamma=.678$, $p<.01$). For structural constraints, significant factors were issues

related to the lack of information about existing parks and programs in the area (X_{10} , $\gamma=-.488$, $p<.01$), parks being too far away (X_2 , $\gamma=.359$, $p<.01$), not having any transportation to the parks (X_2 , $\gamma=.271$, $p<.05$), and parks being over developed (X_2 , $\gamma=.455$, $p<.01$). The interpersonal constraint measures were not significant.

Table 4
Leisure Constraints Formative Index (γ_i on η_i)

Intrapersonal		γ	t
X_1	Fear of crime	.142	-
X_2	Poor health	.394	2.655**
X_3	Not at ease in social situations	.286	1.594
X_4	Pursue recreation in areas other than parks	.678	2.797**
X_5	Don't like to participate in nature or outdoor recreation activities	.241	-1.225
Interpersonal			
X_6	Friends/family prefer to recreate elsewhere	.468	-
X_7	No one to go with to parks	.542	1.023
X_8	Conflicting schedules with my spouse/companion	.163	1.032
Structural			
X_9	The lack of time	.032	-
X_{10}	The lack of information about existing parks and park programs in Northeast Ohio	.488	3.061**
X_{11}	Work commitments	.034	.073
X_{12}	Parks are too far away	.359	2.786**
X_{13}	I have no way to get to parks	.271	2.030*
X_{14}	Park facilities and programs cost too much	.070	.0352
X_{15}	Parks and facilities are too crowded	.064	.983
X_{16}	Parks and facilities are over-developed	.455	2.989**
X_{17}	Too busy with other activities	.153	1.866
X_{18}	Too busy with family responsibilities	-.062	-.495
X_{19}	Lack of transportation	.178	-.025

Goodness of fit indices: $SB\chi^2_{(df=309)}=733.356$, $RMSEA=.040$, $NNFI=.971$, $NFI=.972$, $CFI=.983$

Using some of the metrics that have been reported in the literature to assess reliability and validity portrays the scale questionable. For example, for reliability, McKenzie et al. (2005) have suggested correlating indicators with an alternate measure assessing the focal construct. While we did not have a global measure of constraints, we did have a measure of visitation over the previous 12 months. we anticipated that those most constrained would report visiting less. The resulting correlations were relatively weak ($r<.2$) and varied in valence. Perhaps indication of respondents having negotiated many of the listed constraints. For validity, Bollen's (1989) suggestion to examine the influence of the indicators (γ s) on the latent construct (η s) might also raise suspicion given that only six of 19 indicators had statistically significant influence. In both instances, for the reasons outlined earlier, assessment of validity and reliability of constraint indicators is antithetical to the intent of the scale's development; i.e., to identify factors constraining leisure preference and participation.

Summary of Structural Relationships

For the structural coefficients (see Table 5; place attachment factor solution presented in appendix), to varying degrees, only intrapersonal and structural constraints were statistically significant predictors of the dimensions of place attachment. Intrapersonal constraints were

a negative predictor of all four dimensions of place attachment; place dependence ($\beta = -.273$, $p < .01$), affective attachment ($\beta = -.167$, $p < .01$), social bonding ($\beta = -.235$, $p < .01$), and place identity ($\beta = -.153$, $p < .05$). As anticipated, the more personally constrained respondents felt, the less attached they were to Metroparks settings and facilities. Individual item effects are displayed in Table 5. Constraints associated with poor health (X_2 indirect effect: place dependence = $-.108$, $p < .01$; affective attachment = $-.066$, $p < .01$; social bonding = $-.093$, $p < .01$; place identity = $-.060$, $p < .05$) and preferences for other recreation sites (X_5 indirect effect: place dependence = $-.108$, $p < .01$; affective attachment = $-.113$, $p < .001$; social bonding = $-.159$, $p < .001$; place identity = $-.104$, $p < .001$) each negatively influenced the dimensions of place attachment.

Table 5

Summary of Direct Effects (γ_i on η_i)

Place Dependence	β	SE	t	R^2
Intrapersonal (β_{41})	-.273	.023	-2.908**	.125
Interpersonal (β_{42})	.055	.008	.512	
Structural (β_{43})	-.223	.035	-2.868**	
Affective Attachment				
Intrapersonal (β_{51})	-.167	.014	-2.581**	.063
Interpersonal (β_{52})	-.053	.006	-.540	
Structural (β_{53})	-.144	.023	-2.442*	
Social Bonding				
Intrapersonal (β_{61})	-.235	.021	-2.765**	.072
Interpersonal (β_{62})	-.016	.004	-.292	
Structural (β_{63})	-.104	.025	-1.856	
Place Identity				
Intrapersonal (β_{71})	-.153	.021	-2.535*	.045
Interpersonal (β_{72})	-.058	.011	-.548	
Structural (β_{73})	-.099	.031	-2.001*	

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

Similarly, structural constraints were a negative predictor of place dependence ($\beta = -.223$, $p < .01$), affective attachment ($\beta = -.244$, $p < .01$), and place identity ($\beta = -.099$, $p < .05$) (see Table 3). The more inclined respondents were to indicate structural factors inhibited their access to Cleveland Metroparks settings and facilities, the less likely they were to express an attachment to these settings and facilities. Specifically, issues related to the lack of information about existing parks and programs in the area (X_{10} indirect effect: place dependence = $-.109$, $p < .01$; affective attachment = $-.052$, $p < .05$), parks being too far away (X_{12} indirect effect: place dependence = $-.080$, $p < .05$), not having any transportation to the parks (X_{13} indirect effect: place dependence = $-.060$, $p < .05$), and parks being over developed (X_{16} indirect effect: place dependence = $-.101$, $p < .05$; affective attachment = $-.066$, $p < .05$; social bonding = $-.047$; place identity = $-.018$) were most significant in inhibiting the development of place attachment (see Table 6).

Table 6
Summary of Indirect Effect (γ_i on η_j)

		Indirect Effect			
		Place Dependence	Affective Attachment	Social Bonding	Place Identity
Intrapersonal					
X ₁	Fear of crime	.039	.024	.033	.022
X ₂	Poor health	-.108**	-.066**	-.093**	-.060*
X ₃	Not at ease in social situations	-.078	-.048	-.067	-.044
X ₄	Pursue recreation in areas other than parks	-.185***	-.113***	-.159***	-.104***
X ₅	Don't like to participate in nature or outdoor recreation activities	-.066	-.040	-.057	-.037
Interpersonal					
X ₆	Friends/family prefer to recreate elsewhere	.026	-.025	-.007	-.027
X ₇	No one to go with to parks	.030	-.029	-.009	-.031
X ₈	Conflicting schedules with my spouse/companion	.009	-.009	-.003	-.009
Structural					
X ₉	The lack of time	-.007	-.005	-.003	-.003
X ₁₀	The lack of information about existing parks and park programs in Northeast Ohio	-.109**	-.070*	-.051	-.048*
X ₁₁	Work commitments	-.008	-.005	-.004	-.003
X ₁₂	Parks are too far away	-.080*	-.052*	-.037	-.036
X ₁₃	I have no way to get to parks	-.060*	-.039	-.028	-.027
X ₁₄	Park facilities and programs cost too much	-.016	-.010	-.007	-.007
X ₁₅	Parks and facilities are too crowded	-.014	-.009	-.007	-.006
X ₁₆	Parks and facilities are over-developed	-.101*	-.066*	-.047*	-.045
X ₁₇	Too busy with other activities	-.034	-.022	-.016	-.015
X ₁₈	Too busy with family responsibilities	.014	.009	.006	.006
X ₁₉	Lack of transportation	-.040	-.026	-.019	-.018

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

Problem Solved?

The purpose of this paper was to critique leisure researchers’ misconceptualization of the leisure constraint measurement model and present an alternative analytic approach that is more consistent with the form of constraints indicators. We have argued that because contemporary measures of leisure constraints follow a formative structure, factor analytic approaches are inappropriate owing to incorrect assumptions concerning the measurement model. Conventional metrics for assessing validity and reliability, designed for more traditional reflective measurement models, are also inappropriate. To date, most leisure constraint researchers have assumed their measures are reflective (see Godbey et al., 2010 for review) where correlations among the observed measures associated with a specific latent constraint dimension are directly attributed to that dimension. With formative indicator models, however, causality extends from the observed measure to the latent construct (Bollen, 1989; Bollen & Lennox, 1991). No expectation is assumed for inter-item correlation. This distinction has direct implications for the type of analyses that are appropriate for each type of measure. Factor analytic approaches that have governed leisure constraint research for the past 20-plus years have produced a body of empirical evidence

that undermines claims on the tenability of the dimensional structure underlying the hierarchical model (i.e., the existence of intrapersonal, interpersonal, and structural constraints). Propositions related to the temporal structure and negotiation of the modes of constraint have also been overshadowed by concerns related to construct validity and scale reliability. It is our contention that these issues could be resolved by conceptualizing constraint measures as formative and using analyses that are congruent with this type of measurement. Our empirical example provided an illustration of one latent variable modeling technique for analyzing formative indices along with discussion of the conceptual and empirical issues that must be addressed when conducting the procedure. While not quite “solving the problem” just yet, the technique responds to the theoretical assumptions that underlie the formative measurement characteristics of leisure constraint indicators. Continued testing in varied contexts will begin to reveal the bounds of the procedure along with building on a literature related to formative analysis that remains in its infancy. Most importantly, the procedure has the potential to lay to rest many of the lingering concerns underlying the measurement of constraints. These issues have hindered the testing of hypotheses that have implications for understanding leisure behavior among diverse populations and across a range of contexts.

By embracing the potential for using formative measures, researchers also are better positioned to utilize indicators that are specific to the population or context of concern. In our pursuit of external validity, researchers have striven to develop scales that transcend context and have the potential for broad application across people, place, activity, and time. The abstraction of context, however, has the potential to ignore important information germane to the context of interest. We argue, especially in the context of constraints measurement, that the blind adherence to “established” measures and the psychometric rules governing their adequacy undermines the advancement of constraints research. Generic measures, produce generic findings that are applicable only to nonexistent generic populations. Tailoring measures to be sensitive to the nuance of context and utilizing analytical tools that are consistent with the assumptions underlying their measurement properties will undoubtedly produce stronger findings that are of theoretical and applied value. In the context of constraints research, the generalizability of the hierarchical model lies primarily in its classification of constraint domains and the propositions related to how these domains are temporally distinguished and negotiated. The use of context-specific indicators does not violate the propositions related to the model. Rather, it better situates the researcher to minimize Type 1 and Type 2 error when testing hypotheses driven by the model's tenets.

The modeling procedures we have described in this paper also have the potential to provide better insight for understanding which individual constraints most strongly hinder participation or access. Factor analyses of reflective scales do not directly inform the researcher of which individual items are constraining. Factor loadings only provide insight on the nature of the relationship between the manifest indicators and their latent factors (Brown, 2006). When we regress the latent factors onto other endogenous constructs, the information provided by the regression weight(s) also only provides insight on the latent factor's influence on these other outcomes. Alternately, as displayed in Table 4, we can immediately determine which items have the strongest influence on the latent outcomes (i.e., dimensions of place attachment). An understanding of which constraints most directly hinder access, participation, preference, or even attachment provides an agency with specific information on how they might be able to deliver their services in ways that limit or mitigate the constraint.

A limitation to note concerning our investigation relates to the selection of constraint indicators. First, the indicators that we chose to include for interpersonal constraints were limited and, in retrospect, may not reflect the breadth of constraints that may fall within this dimension as reflected in Raymore et al.'s (1993) investigation. Consistent with the suggestion offered by Diamantopoulos and Winklhofer (2001), decisions on the selection of constraint items should be driven by the need to capture the range of factors that might constrain behavior. Beyond having little influence on the dimensions of attachment at both the item and construct level, the limited number also prevent other useful analyses. Bollen and Ting (2000) introduced an approach (vanishing tetrad test: VTT) that can empirically assist the researcher to determine if their measures are formative or reflective. Unfortunately, the test requires at least four indicators per construct. The test, however, would be a useful complement to the framework outlined in Table 1.

Finally, a flurry of recent publications in the management and information sciences literature illustrates that consensus on the conceptualization and analyses of formative scales has yet to fully develop (Aquirre-Urreta & Marakas, 2012; Bagozzi, 2011; Bollen, 2011; Cenfetelli & Bassellier, 2009; Diamantopoulos, 2011; Edwards, 2011; Hardin, Chang & Fuller, 2008a, 2008b; Jarvis, MacKenzie, & Podsakoff, 2012; Kim, Shin, & Grover, 2010; Marakas, Johnson & Clay, 2007; Petter, Straub, & Rai, 2007). The contrasting opinions among scholars is diverse. Some authors question the validity of formatively measuring latent constructs (Edwards, 2011; Hardin et al., 2008a; Kim et al., 2008), others fervently oppose the claim (Marakas et al., 2007), and others have highlighted problems of biased parameter estimates emerging from misspecified formative models (Cenfetelli & Bassellier, 2009; Jarvis et al., 2012). While these arguments, in both support and opposition, will likely play on for several more years, the need for empirical evidence remains. The growing acceptance of formative measurement has the potential to reflect a paradigm shift in the manner in which we conceptualize and analyze latent phenomena. Leisure researchers can contribute to resolving these issues by testing measurement models of constraint indicators and other constructs that follow a formative structure.

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Appendix A: Place Attachment Reflective Measurement Model

Place Dependence ($\rho_{xx}=.89$; AVE=.67)		λ	t	λ^2	ϵ
Y ₁	I prefer Cleveland Metroparks over other public recreation settings/facilities	.673	-	.453	.547
Y ₂	For the recreation activities that I enjoy most, the settings and facilities provided by Cleveland Metroparks are the best	.787	20.173	.619	.381
Y ₃	For what I like to do, I couldn't imagine anything better than the settings and facilities provided by Cleveland Metroparks	.853	21.491	.728	.272
Y ₄	I enjoy visiting Cleveland Metroparks more than any other sites	.813	20.715	.661	.339
Affective Attachment ($\rho_{xx}=.89$; AVE=.67)					
Y ₅	Cleveland Metroparks means a lot to me	.696	-	.484	.516
Y ₆	I am very attached to Cleveland Metroparks	.809	21.385	.654	.346
Y ₇	I feel a strong sense of belonging to Cleveland Metroparks and its settings/facilities	.814	21.514	.728	.272
Y ₈	I have little, if any, emotional attachment to Cleveland Metroparks and its settings/facilities	.637	17.174	.661	.339
Social Bonding ($\rho_{xx}=.63$; AVE=.36)					
Y ₉	My friends/family would be disappointed if I were to start visiting other settings and facilities	.620	-	.384	.616
Y ₁₀	If I were to stop visiting Cleveland Metroparks' sites, I would lose contact with a number of friends	.479	10.917	.229	.771
Y ₁₁	Many of my friends/family prefer Cleveland Metroparks over other sites	.688	13.871	.473	.527
Place Identity ($\rho_{xx}=.83$; AVE=.63)					
Y ₁₂	I feel Cleveland Metroparks is a part of me	.864	-	.746	.254
Y ₁₃	I identify strongly with Cleveland Metroparks	.878	30.835	.771	.229
Y ₁₄	Visiting Cleveland Metroparks says a lot about who I am	.602	18.756	.362	.638

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

•Item reverse coded

Goodness of fit indices: $SB\chi^2_{(df=71)}=387.144$, RMSEA=.074, NNFI=.974, NFI=.972, CFI=.978

Reexamining the Relationship Between Leisure and Stress Among Older Adults

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Abstract

This study examined whether leisure self-determination and leisure social support were related to acute stress and chronic stress among older adults. Participants were 141 older nursing home residents with high stress levels and 322 older community dwellers with low stress levels. Data were collected using face-to-face surveys, which included measures of leisure self-determination, leisure social support, and acute stress. Chronic stress was measured using an electrocardiogram. Data were analyzed using regression analysis. The results indicated that leisure self-determination and leisure social support were negatively correlated with acute stress among nursing home and community participants. However, leisure self-determination and leisure social support were not correlated with chronic stress in these two groups of older adults. Implications of the results are discussed.

Keywords: *leisure self-determination, leisure social support, acute stress, chronic stress*

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Introduction

People are particularly vulnerable to the effects of stress in older age (Cairney & Krause, 2008). Among older adults, the effects of stress involve the development of physical and psychological health conditions, such as a decreased autonomic nervous system function (Chang, 2014a), decreased immune function (McNaughton, Smith, Patterson, & Grant, 1990), and an increase in anxiety (Zhang, Shi, Wang, & Liu, 2012) and depression (Kwag, Martin, Russell, Franke, & Kohut, 2011). In addition to morbidity, stress increases the mortality risk of older adults (Fredman, Cauley, Hochberg, Ensrud, & Doros, 2010; Vasunilashorn, Gleib, Weinstein, & Goldman, 2013). Therefore, managing stress levels of older adults is a key to maintaining optimal health and increasing life spans.

Empirical evidence has suggested that leisure is considerably and negatively related to stress; for example, participating in leisure activities can reduce occupational stress for female workers even when they must perform extra work at home (Filho, DaCosta, & Ribeiro, 1998), and leisure participation is correlated with stress management among adolescents (Lee, Wu, & Lin, 2012). This relationship between leisure and stress has been shown to be particularly strong among older adults (Chang, 2014b; Fitzpatrick, Spiro III, Kressin, Greene, & Boss, 2001; Patterson, 1996). Despite existing research that has established the relationship between leisure and stress, research has not yet determined which leisure-generated constructs may substantially contribute to stress reduction. Determining such constructs is crucial to develop effective intervention programs for older adults (Chang & Yu, 2013).

In a central study of leisure, Coleman and Iso-Ahola (1993) indicated that leisure self-determination and leisure social support were two crucial leisure-generated constructs that moderated the negative effects of stress on health. Leisure self-determination refers to the belief that participants are allowed to freely choose their leisure activities. Leisure social support pertains to the belief that participants are cared for by leisure companions and that adequate support is available when they need it. Craike and Coleman (2005) demonstrated that leisure self-determination might mitigate the negative effects of stress on psychological health among older adults. Recently, leisure self-determination and leisure social support were observed to exert mitigating effects on stress among older adults (Chang & Yu, 2013). Thus, enhancing levels of leisure self-determination and leisure social support should be an effective method to reduce stress among older adults.

Stress can be divided into acute stress and chronic stress (Hammen, Kim, Eberhart, & Brennan, 2009). Acute stress refers to short-term stress, whereas chronic stress is constant long-term stress, and people hardly recover from the changes of this type of stress. Acute stress is usually assessed by identifying conditions within 12 months before the interview. Stress is coded as chronic if the negative events have occurred for more than 12 months (McGonagle & Kessler, 1990). Chronic stress exerts a more substantial effect on health than acute stress (Cohen et al., 1998; McGonagle & Kessler, 1990). This effect is particularly substantial among older adults (Hugo et al., 2008; Mausbach et al., 2010). Previous studies have examined the relationship between leisure self-determination or leisure social support and acute stress among older adults (Chang & Yu, 2013; Craike & Coleman, 2005; Sasidharan, Payne, Orsega-Smith, & Godbey, 2006). However, how leisure self-determination and leisure social support affect chronic stress is unclear. Therefore, examining the relationships between the leisure self-determination and leisure social support of older adults and their chronic stress is necessary to explore any observed benefits of the constructs.

The psychological health benefits of leisure are not necessarily substantial for participants with low stress levels (Reich & Zautra, 1981). Only when stress is initially high does leisure exert a powerful impact (Craike & Coleman, 2005). According to these findings, leisure self-determination and leisure social support appear to be more related to chronic stress among older adults experiencing high levels of chronic stress compared with those experiencing low levels of chronic stress. However, studies clarifying the relationships between the constructs and chronic stress among older adults with various levels of chronic stress are lacking. Older nursing home residents frequently report higher chronic stress than older community dwellers (Lim, 2002); therefore, examining whether leisure self-determination and leisure social support are substantially and negatively related to chronic stress in these two groups of older adults is essential.

Literature Review

Stress Among Older Adults

Stress is primarily produced by appraising a stressor (Lazarus & Folkman, 1984). Two types of appraisal exist: primary and secondary appraisals. Primary appraisal involves determining whether a negative event is a stressor. Secondary appraisal involves identifying actions that are most likely to enable people to manage the negative events designated as stressors during the primary appraisal (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Coping refers to the behavioral or cognitive efforts used to manage the demands of a designated stressor. Two forms of coping have been identified: (a) problem-focused coping, which directly deals with a stressor, and (b) emotion-focused coping, which reduces the stress experienced as a result of a negative event (Folkman, Lazarus, Gruen, & DeLongis, 1986). According to this theory, older adults may feel stress when they ineffectively cope with a negative stressful event (Tak, Hong, & Kennedy, 2007).

Health-related concerns are the most frequently reported stressors among older adults (Hunter & Gillen, 2009; Tak, 2006). Mourning a friend, relative, or spouse is also a frequently reported stressor (Fitzpatrick et al., 2001; Norris & Murrell, 1990). Older adults face many severe stressors they cannot remove, such as chronic disease, disability, and the loss of loved ones; however, emotion-focused coping can still enable older adults to cope with these stressors (Ong & Bergeman, 2004). Thus, developing an emotion-focused stress-coping strategy is essential for older adults.

Role of Leisure-Generated Constructs in Reducing Stress

Numerous studies have suggested that self-determination and social support are two basic human needs (Niyonsenga et al., 2012; Parker, Jimmieson, & Amiot, 2013), particularly among older adults (Ortega-Smith, Payne, Mowen, Ho, & Godbey, 2007; Sikma, 2009). Self-determination refers to the free choice and initiative in the activities performed by older adults. Social support corresponds to receiving or perceiving adequate support from family and friends. When satisfied, these two needs contribute to psychological health (Deci & Ryan, 2008). Recent studies have indicated that self-determination can facilitate a full processing of emotions related to stressful events over time, thereby promoting enhanced emotional health and decreasing stress (Ntoumanis, Edmunds, & Duda, 2009; Weinstein & Ryan, 2011). Moreover, social support can reduce stress levels through emotion-focused comfort or aid from others to solve problems (Lou et al., 2010). Gerontological studies have also demonstrated that enhancing levels of self-determination and social support is an emotion-focused effective method to reduce the stress faced by older adults (Chang & Yu, 2013; Tak et al., 2007).

Participation in leisure activities can provide older adults with opportunities to exercise self-determination (Chang, 2012). Leisure activities are available to most retired adults and provide pleasurable experiences to supplement the routines of daily life (Chang, 2014a; Hutchinson & Nimrod, 2012; Iso-Ahola, 1980). Participation in leisure activities appears to be an ideal opportunity to promote the self-determination of older adults. Furthermore, the desire to affiliate with strangers decreases in older age when time is perceived as limited (Carstensen, 1995). However, limiting social interactions and meaningful relationships can still lead to affective well-being. Leisure for older adults is thought to be vital because it affords opportunities to interact with family and friends, and receive or perceive social support (Burnett-Wolle & Godbey, 2007). Promoting self-determination through leisure activities refers to leisure self-determination, whereas receiving or perceiving social support from family and friends in leisure contexts refers to leisure social support. In brief, participation in leisure activities for older adults is crucial to promote leisure self-determination and enhance leisure social support.

The stress-buffering hypothesis of Coleman and Iso-Ahola (1993) posits that leisure self-determination and leisure social support can effectively moderate the negative effects of stress on health. Iwasaki and Mannell (2000) also proposed similar concepts, namely hierarchical dimensions of leisure stress coping that include leisure coping beliefs and leisure coping strategies. Leisure coping beliefs refer to general beliefs that leisure enables people to cope with stress. For example, one of the beliefs (leisure self-determination) was reported to act as a buffer against stress to maintain health in the general population (Coleman, 1993; Iso-Ahola & Park, 1996). Leisure coping strategies are actual stress-coping situation-grounded behaviors or cognitions that are accessed through leisure activities. For example, people experiencing stress may become motivated to socialize with others (e.g., leisure companions) after intensely working alone for several consecutive days. Iwasaki (2003) and Iwasaki, Mannell, Smale, and Butcher (2005) have verified that social support from leisure companions can reduce stress. In addition, gerontological studies have indicated that leisure self-determination and leisure social support can enable older adults to reduce stress (Chang & Yu, 2013; Hutchinson, Yarnal, Staffordson, & Kerstetter, 2008).

Relationships Between Leisure-Generated Constructs and Chronic Stress

Since the work of Holmes and Rahe (1967) on life events and illness, acute life events have been a central focus of stress research. Acute life events, such as arguments and movements, refer to acute stress, which differs from chronic stress. However, many studies have indicated that chronic situations, such as chronic disease and disability, are mentioned more often than acute life events when people describe their major sources of stress (Mattlin, Wethington, & Kessler, 1990), and that chronic stress is a stronger predictor of health than acute stress (Cohen et al., 1998; McGonagle & Kessler, 1990). Gerontological studies have also demonstrated that chronic stress exerts a particularly substantial negative effect on health among older adults (Hugo et al., 2008; Mausbach et al., 2010). Therefore, chronic stress should be emphasized when investigating stress in older populations.

To date, research has only examined the acute stress of older adults and explored whether leisure self-determination and leisure social support were substantially related to acute stress (Chang & Yu, 2013; Craike & Coleman, 2005; Sasidharan et al., 2006). Therefore, to understand the role of leisure on stress among older adults, examining the relationships of the constructs with chronic stress is necessary.

Other research has measured chronic stress as the cumulative impact of minor incidents and hassles, such as humid climate and noise, and suggested that these events may have salient

effects on the health of people over time (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982; Kanner, Coyne, Schaefer, & Lazarus, 1981). Schubert et al. (2009) adopted an objective approach to measure chronic stress; they indicated that continuous changes in sympathetic and parasympathetic neural impulses exhibit alterations in heart rate (HR) and cause oscillations of the R-R. R is a point corresponding to the peak of the QRS complex and R-R is the interval between two successive Rs. The QRS complex is a name for the combination of three of the graphical deflections seen on a typical electrocardiogram. Chronically stressed people exhibit a decreased heart rate (Lucini, Di Fede, Parati, & Pagani, 2005). Thus, this study used a parameter based on HR to measure chronic stress. The study examined the relationships between the leisure self-determination and leisure social support of older adults and their chronic stress.

Effects of Leisure-Generated Constructs on Stress in Different Groups

Leisure has been regarded as a stress buffer (Coleman & Iso-Ahola, 1993; Iso-Ahola & Park, 1996), which refers to a factor that is related to health only for people under stress (Cohen & Wills, 1985). According to these studies, leisure may reduce the negative effects of stress on health primarily for people under stress. When their stress levels are low, the effects of leisure will be negligible.

Reich and Zautra (1981) conducted an experiment to examine the relationships among life events, personal activities, and psychological well-being. After completing a series of questionnaires, three randomly selected groups of participants were instructed to (a) engage in 12 activities from a self-selected list of pleasurable leisure activities, or (b) engage in two activities from that list, or (c) return after one month for retesting with no specific instructions for leisure. After the experiment ended, data were collected and analyzed. A prior negative life change was treated as a factor in this experiment, and this life event interacted with the activities. Participants who reported many prior negative changes exhibited less psychiatric distress and more pleasantness than other participants when instructed to engage in 12 activities, rather than two or none. Reich and Zautra indicated that engaging in pleasurable leisure activities increased the positive aspects of the general well-being of the participants, but might only reduce distress for participants who experience high levels of acute stress. Craike and Coleman (2005) also stated that leisure might have a considerable mitigating effect on acute stress among older adults when their levels of acute stress are initially high. In other words, the psychological health benefits of leisure may not necessarily be substantial for older adults who experience low levels of acute stress. Instead, leisure may exert a powerful effect only when acute stress is initially high. Therefore, leisure self-determination and leisure social support may more substantially contribute to acute stress reduction among older adults who experience high levels of acute stress than among those with low levels of acute stress. However, a study of the effects of the constructs on chronic stress among older adults with various levels of chronic stress is lacking.

Many older adults in poor health experience life crises because they must move into nursing homes away from their families and depend on people other than relatives (Choi, Ransom, & Wyllie, 2008; Hunter & Gillen, 2009; Tsai & Tsai, 2008). Older adults residing in nursing homes generally view other residents as acquaintances and rarely form close relationships with them, turning instead to their families for emotional comfort (Carstensen, 1995). Older adults residing in nursing homes frequently experience life adaptation problems. Numerous studies have indicated that chronic health problems, living without families, and life maladaptation are severe stressors (Fitzpatrick et al., 2001; Hunter & Gillen, 2009; Norris & Murrell, 1990). In other words, older adults residing in nursing homes may experience higher levels of chronic stress

than older adults living at home. Therefore, this study compared the chronic stress levels of older nursing home residents and community dwellers and examined whether the relationship between leisure self-determination or leisure social support and chronic stress is stronger among older nursing home residents than among older community dwellers.

Hypotheses

Based on the relevant literature, this study proposed four specific hypotheses: (a) leisure self-determination and leisure social support are significantly and negatively correlated with acute stress among older nursing home residents and community dwellers, (b) leisure self-determination and leisure social support are significantly and negatively correlated with chronic stress among older nursing home residents and community dwellers, (c) path coefficients between the constructs and acute stress are stronger among older nursing home residents than among older community dwellers, and (d) path coefficients between the constructs and chronic stress are stronger among older nursing home residents than among older community dwellers. Study findings are expected to provide healthcare practitioners and leisure providers with information to develop strategies for reducing acute and chronic stress among older adults.

Methods

Participants

Two nursing homes in Taichung City, Taiwan, were randomly selected in 2012. A councilor in Taichung City, an alumnus of our university, visited the directors of the nursing homes to request assistance in recruiting participants from the residents. Sampling was conducted after the directors gave their permission. Participants were required to meet three eligibility criteria: (a) They were aged 65 years or older, (b) they could participate in leisure activities, and (c) they were free from mental health conditions (such as dementia or depression). Participants were excluded if the director of their nursing home reported that a doctor had diagnosed them with a mental health condition. This study recruited 141 older nursing home residents. Each resident received a small gift (a pair of stainless steel eco-chopsticks). This sample was purposively selected for their expected high stress and low activity profile.

Also in 2012, older community dwellers were selected as participants for comparison. This study recruited older community dwellers who were frequently involved in various programs for older adults, such as folk dancing and karaoke. These programs were operated by the Social Affairs Bureau of Taichung City. The councilor called relevant officials to request assistance in recruiting participants. The same eligibility criteria were applied to the community participants. This study recruited 322 older community dwellers who received the same small gift. This community-based sample was purposively selected for their expected low stress and high activity profile.

Measures

To ensure the quality of the data, face-to-face surveys were conducted. For illiterate participants, a full-time assistant with a master's degree read aloud the assessment items.

Leisure self-determination was measured using the scale of Chang and Yu (2013), which is a modified version of the Leisure Self-Determination Scale (LSD) of Weissinger and Bandalos (1995). The scale contains six items related to how older adults perceive themselves as being free to make choices regarding their leisure activities. The following are two examples of the items: (a) I freely choose my leisure activities, and (b) I perceive freedom when participating in leisure activities. The participants were asked to rate the degree to which they agreed with each of the

items on a 5-point ordinal scale, from 1 (*not at all*) to 5 (*completely*). Scores on the LSD ranged between six and 30, and high scores indicated great leisure self-determination.

Leisure social support was measured using the scale of Chang and Yu (2013), which is a modified version of the Leisure Social Support Scale (LSS) of Iwasaki and Mannell (2000). This 16-item scale measures the degree to which older adults feel adequately supported by their leisure companions, and it contains subscales related to emotional support, esteem support, informational support, and perceived aid. Examples of the items referring to each subscale are listed as follows: (a) I feel emotionally supported by my leisure companions, (b) I feel that I am respected by my leisure companions, (c) My leisure companions give me advice when I am in trouble, and (d) My leisure companions will lend me things if I need to borrow them. The participants were asked to rate the degree to which they agreed with each of the items on a 5-point ordinal scale, from 1 (*not at all*) to 5 (*completely*). Scores on the LSS ranged between 16 and 80, and high scores indicated a strong perception of leisure social support.

Acute stress was measured using the 14-item Perceived Stress Scale (PSS) of Cohen, Kamarck, and Mermelstein (1983). Two examples of the items are as follows: (a) In the last month, how often have you successfully coped with life hassles (reverse item)? and (b) In the last month, how often have you felt that you were unable to control the important things in your life? The participants were asked to rate the degree of stress they felt regarding each of the items on a 5-point Likert scale, from 1 (*never*) to 5 (*always*). Scores on the PSS ranged between 14 and 70, and high scores indicated high stress levels.

Chronic stress was measured using an electrocardiogram (SA-3000P, Medi-Core, South Korea), which is widely used to analyze heart rate variability (HRV) related to the autonomic nervous system function and chronic stress status (Chang, 2014a; Huang, Chien, & Chung, 2013). HRV parameters were calculated on normal-to-normal (NN) inter-beat intervals (or NN intervals) caused by normal heart contractions, paced by sinus node depolarization (according to the operation manual of the SA-3000P). The participants rested for 30 minutes before electrocardiographic recordings were conducted for approximately 5 minutes. Chronic stress was assessed according to the physical stress index, which reflects the long-term accumulated outcome of pressure on the heart. The participants with chronic stress scores exceeding 50 were deemed to be under the effects of chronic stress (Chang, 2014a).

Data Analysis

Descriptive statistics were used to describe the characteristics of the participants. Care was taken to ensure the data were normally distributed through inspection of the normal probability plots prior to all analyses. T-tests were conducted to examine whether the acute and chronic stress of nursing home participants were significantly higher than those of community participants. These were done to confirm that comparing nursing home and community participants was appropriate to determine whether leisure self-determination and leisure social support significantly contributed to reducing acute and chronic stress among older adults when their levels of acute and chronic stress were initially high. Regression analyses were performed to examine the relationships between the leisure self-determination and leisure social support of the participants and their acute and chronic stress. Demographic variables were selected as control variables to see if there was a relationship between the constructs and stress (acute and chronic). The demographic variables in this study comprised age, gender (0 = women; 1 = men), education levels, and marital status (0 = single including unmarried, divorced, and widowed statuses; 1 = married status).

Results

The ages of nursing home participants ranged from 65 to 90 years, with a mean age of 79.41 years ($SD = 7.10$). Most of these participants were female and widowed, and had completed primary school. The ages of community participants ranged from 65 to 89 years, with a mean age of 76.20 years ($SD = 6.58$). Most of these participants were female and married, and had completed primary school (Table 1).

Table 1
Characteristics of Participants

Characteristic	Nursing Home Participants		Community Participants	
	<i>n</i>	%	<i>n</i>	%
Gender				
Female	88	62.4	193	59.9
Male	53	37.6	129	40.1
Education				
Illiterate	44	31.2	62	19.2
Primary School Graduates	66	46.8	204	63.4
High School Graduates	16	11.4	36	11.2
University Degree and Above	15	10.6	20	6.2
Marital Status				
Unmarried	16	11.3	4	1.2
Divorced	12	8.5	9	2.8
Widowed	102	72.4	140	43.5
Married	11	7.8	169	52.5

The average leisure self-determination, leisure social support, acute stress, and chronic stress scores of nursing home participants were 14.30 ($SD = 3.38$), 40.87 ($SD = 10.22$), 45.10 ($SD = 11.95$), and 181.15 ($SD = 404.59$), respectively. Community participants scored 21.10 ($SD = 4.19$) for leisure self-determination, 55.96 ($SD = 10.37$) for leisure social support, 40.82 ($SD = 12.13$) for acute stress, and 110.07 ($SD = 144.60$) for chronic stress (Table 2). The acute and chronic stress of nursing home participants were both significantly higher than those of community participants ($t_{AS} = 3.51, p < 0.01$; $t_{CS} = 2.03, p < 0.05$); what this study needed was a “high stress” group and a “low stress” group and this was achieved by sampling in a high stress setting (nursing home) and low stress environment (community).

The results derived from the regression analyses were as follows: First, marital status was significantly and negatively correlated with acute stress ($\beta = -0.11, p < 0.05$) and chronic stress ($\beta = -0.13, p < 0.05$) among community participants; namely, the acute and chronic stress of married community participants were significantly lower than those of single community participants. Second, leisure self-determination and leisure social support were weakly related to acute stress among nursing home participants ($\beta_{LSD} = -0.15, p = 0.09$; $\beta_{LSS} = -0.17, p = 0.06$), whereas the constructs were significantly correlated with acute stress among community participants ($\beta_{LSD} = -0.18, p < 0.01$; $\beta_{LSS} = -0.24, p < 0.01$). The greater the leisure self-determination of community

Table 2
Differences in Constructs Between Nursing Homes and Community Participants

Construct	Nursing Home Participants			Community Participants			<i>t</i>	<i>p</i>
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>		
Leisure Self-Determination	141	14.30	3.38	322	21.10	4.19	18.46	<0.01
Leisure Social Support	141	40.87	10.22	322	55.96	10.37	14.48	<0.01
Acute Stress	141	45.10	11.95	322	40.82	12.13	3.51	<0.01
Chronic Stress	141	181.15	404.59	322	110.07	144.60	2.03	0.04

participants, the lower was their acute stress; similarly, the more their leisure social support, the lower was their acute stress. Third, leisure self-determination and leisure social support were not related to chronic stress among nursing home and community participants. An increase in leisure self-determination or leisure social support did not lead to changes in chronic stress in these two groups of older adults. Fourth, the path coefficients between the constructs and acute stress were weaker among nursing home participants than among community participants; namely, leisure self-determination and leisure social support more substantially contributed to acute stress reduction among community participants than among nursing home participants. Fifth, the path coefficients between the constructs and chronic stress were not significantly different among nursing home and community participants. Leisure self-determination and leisure social support did not contribute to chronic stress reduction in these two groups of older adults (Table 3).

Table 3
Regression Analysis for Factors Predicting Acute Stress and Chronic Stress

Factor	Nursing Home Participants						Community Participants					
	Acute Stress Model			Chronic Stress Model			Acute Stress Model			Chronic Stress Model		
	<i>B</i>	β	<i>p</i>	<i>B</i>	β	<i>p</i>	<i>B</i>	β	<i>p</i>	<i>B</i>	β	<i>p</i>
Age	0.17	0.10	0.23	3.68	0.07	0.45	0.13	0.07	0.19	1.97	0.09	0.11
Gender	-0.99	-0.04	0.63	-38.04	-0.05	0.60	-0.47	-0.02	0.71	-8.34	-0.03	0.61
Education	-1.06	-0.08	0.32	15.55	0.04	0.68	-0.60	-0.04	0.48	-9.09	-0.05	0.40
Marital Status	-3.19	-0.07	0.38	-69.16	-0.05	0.59	-2.72	-0.11	0.03	-38.44	-0.13	0.02
Leisure Self-Determination	-0.54	-0.15	0.09	-8.05	-0.07	0.48	-0.51	-0.18	<0.01	-2.12	-0.06	0.33
Leisure Social Support	-0.21	-0.17	0.06	-4.06	-0.10	0.28	-0.29	-0.24	<0.01	-1.29	-0.09	0.15
<i>F</i>		2.77			0.77			11.24			3.38	
<i>R</i> ²		0.11			0.03			0.18			0.06	

Discussion

This study examined whether leisure self-determination and leisure social support were related to acute and chronic stress among older nursing home residents and community dwellers after controlling for demographic variables. The results of the regression analyses in these two groups of older adults exhibited similar patterns. In each group, leisure self-determination and leisure social support were correlated with acute stress after controlling for marital status, whereas the constructs were not associated with chronic stress. Implications of the results are discussed in the next sections.

Marital Status is an Effective Control Variable

The results of the regression analyses indicated that marital status was significantly and negatively correlated with acute and chronic stress among community participants. The results were consistent with the findings of Chang and Yu (2013) which observed that the stress of married older adults was significantly lower than that of single older adults in their sample of 256 older community dwellers in Taiwan. Therefore, marital status is believed to be an effective control variable for stress. When the variable is entered into the regression models, it can precisely be seen whether leisure self-determination and leisure social support are actually correlated with acute and chronic stress in a given population.

Although marital status was not related to acute and chronic stress among nursing home participants, their marriage rate was low, at only 7.8% of participants reporting spouses. Thus, the results failed to provide sufficient statistical variance to generate precise results. Insufficient data pertaining to the marriage rate hindered precisely examining whether marital status was correlated with these two types of stress.

Leisure-Generated Constructs Are Correlated With Acute Stress

The first hypothesis reasoned that leisure self-determination and leisure social support are significantly and negatively correlated with acute stress among older nursing home residents and community dwellers. The results of the regression analyses supported the first hypothesis and were consistent with findings from previous studies conducted in different cultural settings (Chang & Yu, 2013; Hutchinson et al., 2008). Therefore, higher levels of leisure self-determination and leisure social support appear to be universally related to lower levels of acute stress among older adults.

The results indicate a crucial theoretic implication. Specifically, older adults are unable to remove most stressors they encounter; however, they possess an emotion management capability (Carstensen & Mikels, 2005) that can enable them to reduce acute stress effectively by employing an emotion-focused coping style (Ong & Bergeman, 2004). Because leisure self-determination and leisure social support can facilitate complete emotional processing (Deci & Ryan, 2008; Weinstein & Ryan, 2011) to cope with acute stress (Chang & Yu, 2013; Coleman & Iso-Ahola, 1993), enhancing levels of leisure self-determination and leisure social support may be an effective emotion-focused stress-coping method for older adults.

The results also provide healthcare practitioners with key information regarding efforts for mitigating acute stress to reduce the risk of morbidity and mortality among older adults. Because participation in leisure activities can provide older adults with opportunities to promote leisure self-determination and receive or perceive leisure social support (Chang & Yu, 2013; Craike & Coleman, 2005), practitioners should prioritize offering older adults increased opportunities to engage in feasible leisure activities.

Relationships Between Leisure-Generated Constructs and Chronic Stress Are Mixed

The second hypothesis reasoned that leisure self-determination and leisure social support are significantly and negatively correlated with chronic stress among older nursing home residents and community dwellers. The results of this study did not support the second hypothesis and were not consistent with the stress-buffering hypothesis of Coleman and Iso-Ahola (1993) and the hierarchical dimensions of leisure stress coping of Iwasaki and Mannell (2000). The results have two implications. First, leisure self-determination and leisure social support may not be effective predictors of chronic stress. As such, future studies must identify other crucial constructs to predict chronic stress. Second, the present leisure self-determination and leisure social support may be measurements of only a temporary state, a perception in the short term. A

short-term state predictor may not effectively predict a long-term accumulated state responder; therefore, future studies must develop new scales that can assess long-term accumulated outcomes of leisure self-determination and leisure social support. Only when such scales are developed can chronic stress be effectively predicted.

Relationships Between Leisure-Generated Constructs and Stress in the Different Groups

The third hypothesis posited that path coefficients between the constructs and acute stress are stronger among older nursing home residents than among older community dwellers. The results of this study indicated that leisure self-determination and leisure social support were weakly associated with acute stress among nursing home participants, whereas the constructs were significantly correlated with acute stress among community participants. In other words, the results did not support the third hypothesis. The results were also not consistent with findings from previous studies (Craike & Coleman, 2005; Reich & Zautra, 1981). This may be because nursing home participants engaged less in leisure activities and had fewer opportunities to promote leisure self-determination and receive leisure social support than community participants. For example, the leisure self-determination and leisure social support of nursing home participants were significantly lower than those of community participants (Table 2). It seems that low levels of leisure self-determination and leisure social support may not significantly contribute to acute stress reduction among nursing home participants. According to the results, increasing levels of leisure self-determination and leisure social support should be considered an essential element of acute stress reduction programs designed for older nursing home residents.

The results also indicated that leisure self-determination and leisure social support were not related to chronic stress among nursing home and community participants. Because path coefficients between the constructs and chronic stress in these two groups of older adults were not significant, comparing the path coefficients in these two groups of older adults (the fourth hypothesis) was not meaningful.

Strengths, Limitations, and Suggestions

This study has two strengths. First, this study examined the critical topics of leisure and coping with stress. Although many studies have examined the relationships between leisure-generated constructs and acute stress among older adults (Chang & Yu, 2013; Craike & Coleman, 2005; Sasidharan et al., 2006), little research has explored the relationships between leisure-generated constructs and chronic stress. Even though hypotheses related to chronic stress were not supported, investigation of this construct is warranted as it is the primary stress factor related to health and wellness among older adults. Second, nursing home participants were randomly recruited; therefore, the results more precisely reflected population parameters obtained from older nursing home residents.

Two limitations must be acknowledged as well. First, cause-effect conclusions cannot be directly drawn from the results because of the correlational analyses of this study. Second, the results of the survey from community participants must be carefully interpreted. Although nearly all of the older community dwellers who were involved in the programs operated by the Social Affairs Bureau of Taichung City were recruited, this group was purposively selected. Many factors, such as a predisposition for social engagement, depression, physical health, and socioeconomic status, are related to stress among older adults. The characteristics of purposive sample when involving these factors do not ensure the same characteristics in the population; therefore, the results may not be generalizable to all older community dwellers.

This study suggests that future studies should perform the following tasks to reach robust conclusions: First, this study did not examine the relationship between leisure self-determina-

tion or leisure social support and acute stress among solitary older adults or cerebral stroke survivors who may participate in fewer leisure activities and experience less leisure self-determination and leisure social support than older nursing home residents; therefore, future studies should explore the relationship in these two groups of older adults to clarify whether low levels of leisure self-determination and leisure social support can reduce acute stress. Second, future studies should develop new scales that can be used to assess long-term accumulated outcomes of leisure self-determination and leisure social support, and then examine whether long-term leisure self-determination and leisure social support are significantly correlated with chronic stress to clarify the relationships between the constructs and chronic stress. Third, future studies should determine the effects of leisure self-determination and leisure social support on acute and chronic stress, using an experimental design, to identify any causal relationships between the constructs and stress (acute and chronic).

Conclusion

The results suggested that leisure self-determination and leisure social support contributed to acute stress reduction among older nursing home residents and community dwellers. Although the contribution path patterns of the constructs were similar in these two groups of older adults, the contributions were particularly significant among older community dwellers with high levels of leisure self-determination and leisure social support. Therefore, enhancing levels of leisure self-determination and leisure social support is crucial for older adults, particularly older nursing home residents.

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Leisure in Urban China

General Patterns Based on a Nationwide Survey

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Abstract

This paper examines national-level leisure time availability and participation patterns among urban residents of China. The findings show that Mainland Chinese enjoy relatively little leisure time and that strong contrasts exist in regional distribution of free time availability. People of all ages, genders, and incomes show a general preference for passive/media and other home-based activities while displaying low participation rates in exercise. Regional comparisons show that residents of the Northeast are busiest and engage most frequently in home-based activities while people in the West have more leisure time and engage in social activities most frequently. Differences in leisure time availability and leisure participation based on gender, age and income are also explored.

Keywords: *leisure time; leisure activity; Mainland China*

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As the second largest and one of the most rapidly growing economies in the world, China's economic development has been a remarkable success. A number of changes in government policies introduced in the last two decades, including a 5-day work week and annual three week-long vacations, have led to a significant increase in leisure time availability for Chinese residents (Yin, 2005) and to the development of leisure infrastructure (Dong, Li, & Kim, 2013). Moreover, over the past two decades, individual disposable income has grown significantly in China, while globalization and Western cultural influences have led to an increased demand for Western goods, including those related to leisure and travel (Liang & Walker, 2011). Under such favorable conditions, a large portion of the Mainland Chinese population has developed an interest in pursuing higher quality and a greater variety of leisure activities (Dong et al., 2013). Dong et al. described this as a "contemporary popular culture that is steeped in consumerism" (p. 281) and argued that it creates a climate of "exciting new opportunities" and "terrifying new pressures" for the Chinese society at the time of cultural and economic transition.

These trends have triggered a renewed interest among Chinese and foreign scholars in the leisure experiences of the Chinese population. While the literature on leisure behavior among Chinese immigrants in the U.S. and Canada is quite extensive (e.g., Spiers & Walker, 2009; Walker, Halpenny, & Deng, 2011; Walker, Halpenny, Spiers, & Deng, 2011), empirical studies on the leisure patterns among the Mainland Chinese are only developing. The literature has shown that despite recent economic developments, and due to the influence of Confucianism and Taoism, the value of leisure has been generally less recognized in China than in North America (Li, 2009; Walker, Deng, & Chapman, 2007; Walker & Wang, 2008). Most scholars have also observed that Mainland Chinese primarily engage in passive activities and place less emphasis on physical activity (e.g., Freysinger & Chen, 1993; Jim & Chen, 2009; Lee & Zhang, 2010). It has been suggested that because the philosophical traditions of Confucianism and Taoism have a strong influence on Chinese society (Gong, 1998; Schutte & Ciarlante, 1998), Mainland Chinese are not necessarily free to pursue leisure activities of their choice, but must consider family or social obligations first and use quiet and solitary activities (e.g., learning) as a justification to engage in leisure (Ap, 2002). Time available for leisure and leisure participation patterns among the Chinese vary based on people's demographic characteristics such as gender and age. For instance, Jim and Chen (2009) found that middle-age respondents spent more time on work activities and taking care of their families, while younger people were able to allocate more time to leisure. Studies by Wang, Zhang, and Gong (1999) and by Wang, Liu, and Xu (2003) indicated that although men and women enjoy roughly equal amounts of leisure time, their leisure preferences differ. In Wang's et al. (2003) study, female residents of Shanghai, Tianjin, and Harbin engaged more frequently in activities related to self-improvement and community service than their male counterparts. The existing research also shows that residents of urban areas in China face constraints on leisure, such as overwork, lack of free time, lack of money, lack of partners, and family responsibilities (Dong & Chick, 2012; Zheng & Zhu, 2006). Moreover, Mainland Chinese students were found to be more intra- and interpersonally constrained than their Canadian counterparts (Walker, Jackson, & Deng, 2007, 2008).

Unfortunately, the majority of the existing studies on leisure behavior of the Mainland Chinese have been based on small samples, had only local or regional focus, and were quite narrow in scope. This exploratory study aims to address these limitations by taking advantage of a large scale, country-wide survey ("Survey of the Chinese Economic Life" [SCEL]) to explore leisure behaviors of Chinese residents. The specific objectives of this study were (a) to examine national-level leisure time availability and leisure participation patterns among Chinese urban

residents; (b) to explore regional differences in leisure time availability and leisure participation patterns among Chinese urban residents; and (c) to examine demographic differences (based on gender, age, and income) in leisure time availability and leisure participation patterns among urban Chinese population.

Methods

The data for this study were obtained from the Survey of the Chinese Economic Life (SCEL) covering all 31 provinces, autonomous regions, and municipalities of Mainland China. The survey was designed by the Peking University, Beijing International Studies University, and China Central Television, administered by China's National Bureau of Statistics (CNBS), and delivered by the General Post Office of China. The survey was conducted from May 2011 to February 2012. One hundred thousand questionnaires were distributed across Mainland China by local postal employees. Each city/village post office was given a certain number of questionnaires based on the population of the area and asked to randomly distribute them to local residents. In order to minimize omissions, improperly completed surveys and to overcome the problem of limited literacy, postal employees recorded the responses to the survey. The postmen were then responsible for mailing the surveys to the Computing Center of CNBS. This process yielded 73,622 complete questionnaires with a valid response rate of 86.6%. Only the data collected from the urban part of the sample were used in this study. More than 52,000 (52,092) surveys from 99 urban areas were analyzed.

The questionnaire included 14 questions focusing on the consumption patterns, social issues, income expectation, health expenditures, happiness, leisure time, and leisure activities. The two questions that pertained to leisure that were used in this study included "How much leisure time (except for sleeping, schooling, and eating) per day, on average, did you have in the last year?" The response categories ranged from none to more than five hours. Respondents were also asked to choose their three most often participated in leisure activities out of the list of nine pastimes (including watching TV, surfing the Internet, reading books, shopping, eating out or party, fitness and exercising, resting at home, going to cinema/theater/stadium, and playing cards). Socioeconomic questions included age, gender, income, education, and marital status.

All of the measures from the original Simplified Chinese questionnaire were translated into English by the bilingual first author of this paper and his translation was verified by another individual fluent in both languages. Subsequently, in order to account for the significant differences between geographic regions of the country and to allow for regional comparisons, the sample was sub-divided into four regions based on different levels of economic development in China: East, Center, West and Northeast (CNBS, 2010) (Table 1 and Figure 1).

Based on the categories developed by Wang, Zhang, and Gong (1999), Wang, Liu, and Xu (2003), and Zhou, Li, Xue, and Lei (2012), leisure activities were grouped into five categories: passive/media-based (watching TV and surfing the Internet), other home-based (reading books, resting at home, and playing cards), exercising (fitness and exercising), social (eating out/party, going to cinema/theater/stadium), and shopping (shopping). Midpoint values were assigned to leisure time categories (e.g., 1.5 to 1-2h category, 5.5 to over 5 hours category).

The data analysis consisted of three stages: (a) General leisure patterns in leisure time availability and activities participation were analyzed by frequency and percentage distribution; (b) Differences in leisure time availability and leisure activities participation among the four regions were analyzed using descriptive statistics and ANOVAs with LSD post-hoc tests; and (c) Cross-tabulations, t-tests, and ANOVAs with post-hoc tests were used to examine differences in leisure

Table 1

Regional Distribution of Respondents

Region	Number of cities	Number of respondents	GDP per capita (Local currency)	GDP per capita (U.S. dollars)
East	39	23385	57455.50	8895.90
Northeast	9	4241	40412.33	6257.00
Center	27	10907	29187.50	4519.17
West	24	13559	28564.67	4422.42
Total	99	52092		

Note. According to different levels of economic development, the entire Mainland Chinese administrative territory is divided into 4 regions: the eastern, the central, the western and the northeast (CNBS, 2010). Data of per capita GDP have been extracted from CNBS (2010).



Figure 1. Map of Chinese Four Regions Identified in the Study

time availability and leisure activities participation based on gender, age, and income. Due to a possibility that statistical significance might have been influenced by a large sample size, a probability level of $p < .001$ was used as a cut-off point for statistical significance. The effect sizes were calculated for all relationships of interest (Cohen, 1992; Lantz, 2013).

Results

Sociodemographic Characteristics of the Sample

The sample included slightly more men (58.7%) than women (Table 2). The majority of respondents (91.6%) were young or middle aged and married (68.7%). Almost half (49.6%) had graduated from high school or technical secondary school. Close to half (43.1%) of the respondents made between 20,000-50,000 Yuan (\$3,218-\$8,045) per year and 34.1% less than 20,000 Yuan (\$3,218) per year.

Table 2*The Sociodemographic Characteristics of Respondents*

Variable	Frequency	Percentage (%)
Gender		
Male	30,578	58.7
Female	21,514	41.3
Age (year)		
18-35	23,806	45.7
36-59	23,910	45.9
Over 60	4,376	8.4
Marital status		
Unmarried with significant other	7,605	14.6
Unmarried without significant other	6,095	11.7
Married	35,787	68.7
Divorced	1,667	3.2
Widowed	938	1.8
Education		
Primary school and below	4,376	8.4
High school and technical secondary school	25,838	49.6
Junior college	16,461	31.6
Bachelor degree or above	5,522	10.6
Income (Yuan, RMB per year)		
0-20,001	17,763	34.1
20,000-50,001	22,452	43.1
50,000-100,000	9,689	18.6
>100,000	2,188	4.2

There were significant regional differences in the sociodemographic characteristics of the respondents. Men were overrepresented in each region, but in particular in the Northeast and East (62% and 60% of the sample, respectively) ($\chi^2=88.6$; $v=3$; $p < .001$). Of all regions, respondents from the Center included the highest proportion of older people (9.2%), while those from the Northeast had the highest proportion of people in the youngest age category (49.4%) ($\chi^2=133.6$; $v=6$; $p < .001$). Income levels were also significantly different by region, with residents of the East being overrepresented in the highest income category (5.1% making more than 100,000Y/year), while residents of the Northeast being overrepresented in the lowest income bracket (50% with incomes below 2,000Y/year) ($\chi^2=1113.9$; $v=9$; $p < .001$).

National-level Leisure Time Availability and Leisure Participation Patterns

Leisure time availability. On average, Chinese respondents enjoyed 2.17 hours of leisure time per day. The highest proportion of the respondents (27.2%) indicated having between 1–2 hours of leisure time per day (Figure 2). The majority of the sample (73.7%) had less than 4 hours of leisure a day and only 6.6% had more than 5 hours of leisure time per day.

Leisure participation patterns. More than three quarters (77.1%) of the respondents engaged in passive/media-based leisure (watching TV and surfing the Internet), 71.6% in other home-based activities (reading books, resting at home and playing cards), 21.9% in exercising, 40.6% in socializing, and 33.8% in shopping (Figure 3).

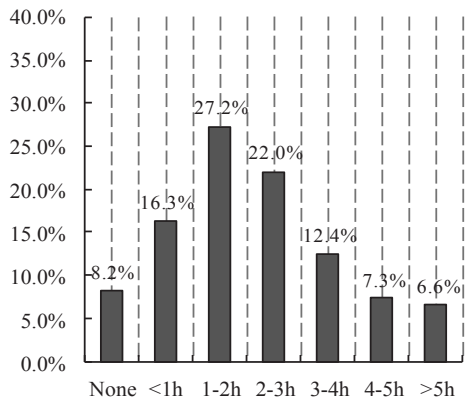


Figure 2. Frequency Distribution of National-Level Leisure Time Availability

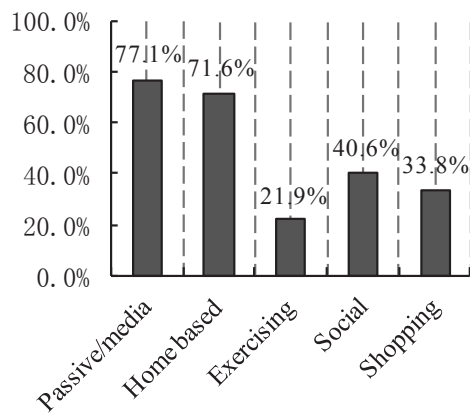


Figure 3. Frequency Distribution of National-Level Leisure Activity Participation

Regional Differences in Leisure Time Availability and Leisure Participation Patterns

Regional differences in leisure time availability. Similar patterns of leisure time distribution were observed in all regions (Table 3). However, the residents of the Northeast reported less leisure time than others, while the residents of the West enjoyed more leisure time than those residing in other regions. The results of the ANOVA confirmed significant differences in leisure time availability ($F=41.639$, $v=3$, $p < .001$, $ES=0.002$). LSD post-hoc tests showed that there were significant differences between the East and the West ($SE=0.0165$, $p < .001$); the East and the Northeast ($SE=0.0255$, $p < .001$); the Northeast and the West ($SE=0.0269$, $p < .001$); the Northeast and the Center ($SE=0.0276$, $p < .001$); and the Centre and the West ($ES=0.0196$, $p < .001$).

Table 3*Frequency Distributions of Leisure Time for Four Geographic Regions*

	East		Northeast		Center		West	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
None	1810	7.7%	357	8.4%	926	8.5%	1194	8.8%
Less than 1 hour	3764	16.1%	935	22.0%	1868	17.1%	1907	14.1%
1-2 hours	6717	28.7%	992	23.4%	2962	27.2%	3472	25.6%
2-3 hours	5294	22.6%	882	20.8%	2364	21.7%	2927	21.6%
3-4 hours	2746	11.7%	551	13.0%	1332	12.2%	1855	13.7%
4-5 hours	1571	6.7%	323	7.6%	768	7.0%	1126	8.3%
More than 5 hours	1483	6.3%	201	4.7%	687	6.3%	1078	8.0%
Total	23385	100.0%	4241	100.0%	10907	100.0%	13559	100.0%

Table 4*ANOVA Leisure Time by Four Geographic Regions*

Multiple comparison Leisure time LSD						
Region		Mean	SE	<i>p</i>	95% Confidence Interval	
					Lower Bound	Upper Bound
East	Centre	.0138	.0177	.435	-.021	.049
	West	-.1445***	.0165	.000	-.177	-.112
	North East	.1002***	.0255	.000	.050	.150
Northeast	East	-.1002***	.0255	.000	-.150	-.050
	Centre	-.0864***	.0276	.002	-.141	-.032
	West	-.2448***	.0269	.000	-.297	-.192
Center	East	-.0138	.0177	.435	-.049	.021
	West	-.1583***	.0196	.000	-.197	-.120
	North East	.0864***	.0276	.002	.032	.141
West	East	.1445***	.0165	.000	.112	.177
	Centre	.1583***	.0196	.000	.120	.197
	North east	.2448***	.0269	.000	.192	.297

Note. ***. Denotes difference significant at $p < .001$ level.

Regional differences in leisure participation patterns. The ranking of participation in leisure activities was the same across all four geographic regions, with passive/media activities being the most popular, followed by home-based activities, social activities, shopping, and exercising (Table 5). The participation rates in passive/media, home-based, and social activities were significantly different across the regions. People from the West participated in social activities most frequently (43.76%; $\chi^2=95$; $v=3$; $p < .001$; $d = 0.043$), while those from the East participated in passive/media activities more frequently than people from other regions (78%; $\chi^2=28.3$; $v=3$; $p < .001$; $d=0.023$). In contrast, residents of the Northeast participated in home-based activities more often than others ($X^2=28.5$; $v=3$; $p < .001$; $d = 0.023$).

Demographic Differences in Leisure Time Availability and Leisure Participation Patterns

Gender. The results of a t-test showed that men had significantly more leisure time than women ($F=27.30$, $p < .001$, $ES=0.064$), although the absolute difference was small (Table 6). Leisure time distribution among men and women was quite similar (Figure 4). Both men and women were most frequently engaged in passive/media-based activities and home-based activities. However, there were significant variations in leisure participation patterns based on gender

Table 5

Frequency Distributions of Leisure Activities for Four Geographic Regions

	East		Center		West		Northeast		
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Passive/media	18199	78.00%	8235	75.77%	10323	76.29%	3290	77.94%	$\chi^2=28.3$; $v=3$; $p<.001$; $d=0.023$
Home-based	16502	70.72%	7818	71.93%	9754	72.09%	3145	74.51%	$\chi^2=28.5$; $v=3$; $p<.001$; $d=0.023$
Exercising	5033	21.57%	2451	22.55%	3022	22.33%	864	20.47%	$\chi^2=10.7$; $v=3$; $p=0.013$
Social	9380	40.20%	4108	37.80%	5921	43.76%	1668	39.52%	$\chi^2=95$; $v=3$; $p<.001$; $d=0.043$
Shopping	7913	33.91%	3566	32.81%	4598	33.98%	1460	34.59%	$\chi^2=6.2$; $v=3$; $p=0.101$

Table 6

T-Test Leisure Time by Gender

T-test leisure time by gender - Group Statistics					
	Gender	N	Mean	SD	SE Mean
Leisure time	Male	30583	2.206	1.5451	.0088
	Female	21509	2.109	1.5026	.0102

T-test leisure time by gender -Independent Samples Test									
		Levene's Test for Equality of Variances		t-test for Equality of Means				95% Confidence Interval of the Difference	
		F	p	T	v	p (2-tailed)	Mean Difference	SE Difference	
Leisure time	Equal variance assumed	27.301	.000	7.175	52090	.000	.0976	.0136	Lower Upper
	Equal variance not assumed			7.210	47079.980	.000	.0976	.0135	.0710 .1241

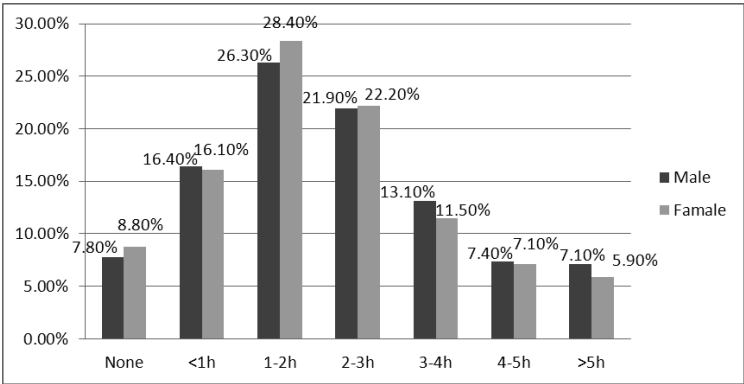


Figure 4. Leisure Time by Gender (Comparison by Categories)

(Table 7). In particular, more men than women participated in home-based activities (72.5% vs. 70.4%; $\chi^2=25.8$; $v=1$; $p < .001$; $d = 0.012$), exercising (23.1% vs. 20.1%; $\chi^2=66.4$; $v=1$; $p < .001$; $d = 0.036$), and social activities (41.7% vs. 38.9%; $\chi^2=39.9$; $v=1$; $p < .001$; $d = 0.028$). Women participated more frequently in only one type of activity – shopping (41.3% vs. 28.5%; $\chi^2=920.2$; $v=1$; $p < .001$; $d = 0.133$).

Table 7*Cross Tabulation Leisure Activity by Gender*

	Leisure Activity				
	Passive/media %	Home-based %	Exercising %	Social %	Shopping %
Male	77.5%	72.5%	23.1%	41.7%	28.5%
Female	76.5%	70.4%	20.1%	38.9%	41.3%
	$X^2=7.7$; $v=1$; $p=.005$	$X^2=25.8$ $v=1$; $p<.001$ $d=0.012$	$X^2=66.4$ $v=1$; $p<.001$ $d=0.036$	$X^2=39.9$ $v=1$; $p<.001$ $d=0.028$	$X^2=920.2$ $v=1$; $p<.001$ $d=0.133$

Age. The results of the ANOVA revealed significant differences in leisure time availability depending on age ($F=415.208$, $v=2$, $p < 0.001$, $ES=0.016$). The results of LSD post-hoc tests confirmed that there were significant differences between the young and older adult categories ($SE=0.0250$, $p < .001$) and between the middle aged and older adult categories ($SE=0.0250$, $p < .001$) (Table 8). Overall, the amount of free time decreased slightly between the young and the middle age categories and then sharply increased for the oldest age category (Figure 5).

Table 8*ANOVA Leisure Time by Age*

Multiple Comparisons Leisure time LSD						
Age	Age	Mean Difference	SE	p	95% Confidence Interval	
Young	Middle aged	.0010	.0139	.945	-.026	.028
	Older adult	-.6907***	.0250	.000	-.740	-.642
Middle aged	Young	-.0010	.0139	.945	-.028	.026
	Older adult	-.6916***	.0250	.000	-.741	-.643
Older adult	Young	.6907***	.0250	.000	.642	.740
	Middle aged	.6916***	.0250	.000	.643	.741

Note. ***. Denotes difference significant at $p<.001$ level.

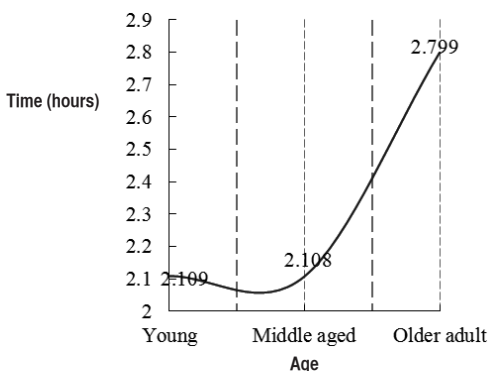


Figure 5. Leisure Time by Age (General Trend)

Leisure activity patterns differed depending on age (Table 9). Older respondents had the highest proportion of participants in home-based activities (77.3%; $\chi^2=161.8$; $v=2$; $p < .001$; $d = 0.056$) and, interestingly, exercising (30.9%; $\chi^2=263.1$; $v=2$; $p < .001$; $d = 0.071$). The youngest respondents had the highest proportion of participants in passive/media activities (78.5%; $\chi^2=166.4$; $v=1$; $p < .001$; $d = 0.057$) and shopping (35.4%; $\chi^2=77.1$; $v=2$; $p < .001$; $d = 0.039$). Participation in socializing was lowest among the middle aged people (39%; $\chi^2=42.6$; $v=2$; $p < .001$; $d = 0.028$). In general, participation in home-based activities and in exercising increased with age, participation in passive/media-based activities and in shopping decreased with age, and participation in social activities showed a U-shaped pattern.

Table 9
Cross Tabulation Leisure Activity by Age

	Leisure Activity				
	Passive/media %	Home-based %	Exercising %	Social %	Shopping %
Young	78.5	69.2	19.9	41.9	35.4
Middle aged	77.0	73.0	22.2	39.0	33.0
Older adult	69.6	77.3	30.9	41.8	29.0
	$\chi^2=166.4$; $v=2$; $p<.001$	$\chi^2=161.8$ $v=2$; $p<.001$	$\chi^2=263.1$ $v=2$; $p<.001$	$\chi^2=42.6$ $v=2$; $p<.001$	$\chi^2=77.1$ $v=2$; $p<.001$

Income. The results of the ANOVA revealed that leisure time availability increased with people’s income ($F=169.740$, $v=3$, $p < .001$, $ES=0.01$) (Figure 6). The results of LSD post-hoc tests confirmed that there were significant differences between people in each income category except between those in the 50,000-100,00Y and over 100,000Y categories. People in the lowest income category had on average 1.97 hours on free time per day, while those in the highest income category had 2.39 hours (Table 10).

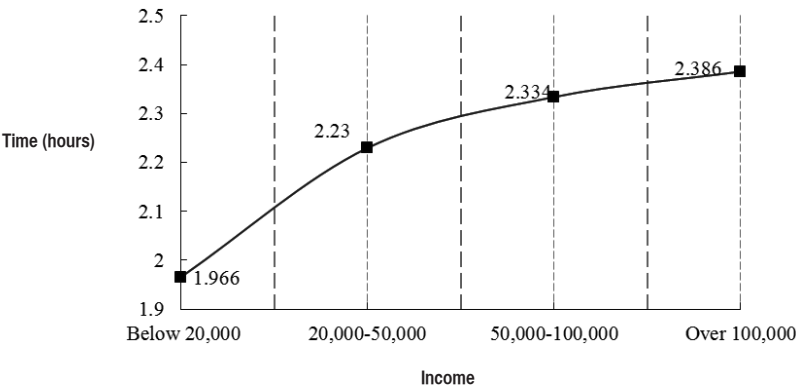


Figure 6. Leisure Time by Income (General Trend in Yuan)

Table 10*ANOVA Leisure Time by Income*

Multiple Comparisons Leisure time LSD						
Annual household income (Yuan)	Annual household income	Mean Difference	SE	<i>p</i>	95% Confidence Interval	
					Lower	Upper
0-20,000	20,000-50,000	-.2632***	.0153	.000	-.293	-.233
	50,001-100,000	-.3676***	.0192	.000	-.405	-.330
	>100,000	-.4191***	.0344	.000	-.486	-.352
20,001-50,000	<20,000	.2632***	.0153	.000	.233	.293
	50,001-100,000	-.1044***	.0185	.000	-.141	-.068
	>100,000	-.1559***	.0340	.000	-.223	-.089
50,001-100,000	<20,000	.3676***	.0192	.000	.330	.405
	20,001-50,000	.1044***	.0185	.000	.068	.141
	>100,000	-.0515	.0359	.152	-.122	.019
>100,000	<20,000	.4191***	.0344	.000	.352	.486
	20,001-50,000	.1559***	.0340	.000	.089	.223
	50,001-100,000	.0515	.0359	.152	-.019	.122

Note. ***. Denotes difference significant at $p < .001$ level.

Leisure activity patterns varied greatly for people with different income levels (Table 11). Participation in passive/media activities was the highest among people with lowest incomes (79.7%, $\chi^2=468.7$; $v=3$; $p < .001$; $d = 0.095$) and decreased with increasing income. The same trend was observed for participation in home-based activities (72.7%, $\chi^2=70.1$; $v=3$; $p < .001$; $d = 0.037$). Participation in exercising (30.5%, $\chi^2=161.4$; $v=3$; $p < .001$; $d = 0.056$) and in social activities (52.7%, $\chi^2=479.9$; $v=3$; $p < .001$; $d = 0.096$) showed a reverse trend. Participation in shopping showed an inverse U-shaped pattern. It was the highest among people with incomes between 50,001–100,000Y (36.8%, $\chi^2=71.1$; $v=3$; $p < .001$; $d = 0.037$).

Table 11*Cross Tabulation Leisure Activity by Income*

	Leisure Activity				
	Passive/media %	Home-based %	Exercising %	Social %	Shopping %
0- 20,000 Yuan	79.7	72.7	20.4	36.9	31.8
20,001-50,000	78.9	72.2	21.1	39.0	33.9
50,001-100,000	70.5	69.6	24.4	48.0	36.8
More than 100,000	67.2	65.8	30.5	52.7	34.8
	$\chi^2= 468.7$	$\chi^2= 70.1$	$\chi^2= 161.4$	$\chi^2= 479.9$	$\chi^2= 71.1$
	$v=3$; $p<.001$	$v=3$; $p<.001$	$v=3$; $p<.001$	$v=3$; $p<.001$	$v=3$; $p<.001$
	$d=0.095$	$d=0.037$	$d=0.056$	$d=0.096$	$d=0.037$

Discussion

The findings indicate that, compared to leisure time availability in developed countries such as the U.S., New Zealand, and Japan, Chinese enjoyed relatively little leisure time (Bureau of Labor Statistics, 2008; Ministry of Internal Affairs and Communications, 2006; Statistics New Zealand, 1999; Zhou et al., 2012). We can attribute this to three factors. First, the traditional labor intensive nature of the Chinese agriculture and manufacturing is likely responsible for the low availability of free time among large parts of its population. Second, the unfavorable attitudes to leisure (Li, 2009; Liu, Yeh, Chick, & Zinn, 2008) associated with the traditional Chinese culture and the higher value placed on work in Chinese society (Wang & Stringer, 2000) may partly explain the low levels of leisure time in China. Third, the availability of leisure time is likely influenced by the general lower level of economic development of the country and the corresponding low levels of disposable income that, in turn, constrains leisure participation and leisure time availability (Deng, Walker, & Swinnerton, 2005; Dong, Hou, & Zhou, 2010).

In terms of regional variations, differences were shown to exist in the distribution of free time availability in China, although the effect size was small (Lantz, 2013). The fact that people in the West had the most time available for leisure and people from the Northeast had less leisure time than those in the East and West can be attributed to the regional differences in industry, with the Northeast being the biggest traditional manufacturing base (Wang, Zheng, & Shi, 2006), while the West is a less industrially developed region (Qing, Wang, & Dong, 2011). Moreover, the sample from the Northeast included the highest proportion of people with low incomes who tend to have least time available for leisure.

The overall pattern of preference for passive/media and other home-based activities, combined with the low participation rates in exercise evident across all genders, ages, and income categories is consistent with findings from existing research (e.g., Jackson & Walker, 2006; Walker & Wang, 2008, 2009). Chinese people's preference for passive activities is deeply rooted in the traditional culture that prioritizes work and learning and contrasts physical activity with mental or intellectual capacities (Walker & Deng, 2004; Wang & Stringer, 2000).

The findings also indicated that men had on average slightly more leisure time than women, although the effect size was small. Moreover, women engaged in shopping more often than men, while men engaged more frequently in social activities, home-based leisure, and exercising. These gender differences in leisure time availability and allocation can be attributed to cultural influences. Chinese women's leisure lives are still affected by the traditional Confucian value system of feminine virtue and morality that prescribes that the public domain is the sphere of men whereas the private domain is the sphere of women (Guo, 2005). This helps to explain why men were engaged in more social activities, such as eating out, partying, and going to events than women. With respect to age, a U-shaped pattern of leisure time availability was detected. Such trends are observable not only in China, but in the Western countries as well (Kleiber, Walker, & Mannell, 2011), as middle aged people usually care for their children and have to deal with the pressures of work. Regarding the effects of age on activity patterns, not surprisingly, the rates of involvement in home-based activities were the highest among people in older age categories, which confirms the trend observed in other countries (Kleiber et al., 2011). Interestingly, however, the rates of participation in passive/media activities have decreased with age and participation in exercising has gone up. This is likely attributable to the fact that participation in passive/media activities was affected by the involvement in on-line leisure and that in China it is the older population that typically engages in low-impact exercising such as tai-chi. Income

was also found to affect leisure time availability and leisure participation patterns, although the effect size was small (Lantz, 2013). More economic resources provided more freedom to enjoy leisure time and to engage in activities of choice (Borodulin, Laatikainen, Lahti-Koski, Jousilahti, & Lakka, 2008). Furthermore, Chinese participants with higher discretionary incomes displayed an increased awareness of Western leisure lifestyles (Wang, 2001), which promoted their participation in active pastimes and in shopping, while reducing participation in home-based and passive/media leisure.

The findings of this study provided useful preliminary information on the distribution of leisure time and activity participation among the urban Chinese population. Our study is one of the first attempts to provide insights into the leisure behavior among a cross-section of the population of this entire country. Our findings also underscore the importance of recognizing the regional diversity, as well as the rapid cultural, social, and economic changes taking place in China. Although this study generated some innovative findings, it also had a number of limitations. The scope of analysis was hindered by the design of the survey instrument, which contained only two items pertaining to leisure behavior. Moreover, the manipulation of the survey data introduced additional limitations since midpoint values were assigned to leisure time categories and an arbitrary value of 5.5 hours was used for the "over 5 hours" category, which could have introduced a downward bias. Lastly, the effects sizes discovered in the study were small, which underscores the need to treat the results of the study with caution. It would be desirable if future research provided more detailed information to help to account for the regional differences in leisure behavior in China and certain findings obtained in this study that are difficult to explain based solely on the results of a survey.

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Urban Parks and Psychological Sense of Community

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Abstract

Parks and other urban natural spaces are increasingly becoming recognized as valuable for supporting socially healthier urban communities. Currently, however, there remains a relative shortage of empirical research specifically evaluating the relationship. This study explores psychological sense of community (PSOC) and its relationship to urban parks, using survey data collected in Norfolk, Virginia. Regression, *t*-test, and chi square analyses were used to examine how park use frequency and proximity are related to overall PSOC and its components. Our findings suggest that park use has a relationship to PSOC among respondents in our sample. More significantly for park planners and managers, our results also suggest that the presence of nearby parks, regardless of visitation, also has a positive relationship to PSOC.

Keywords: *psychological sense of community; urban parks; park use; park proximity; park perceptions*

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Research suggests that urban areas suffer from social problems including urban crime and safety issues, decreasing levels of civic engagement and social connectedness (Chavis & Wandersman, 1990; Gospodini, 2002), and lower psychological sense of community (PSOC) (Milgram, 1970; Park, 1967). Currently, nearly 84% of the U.S. population lives in 366 metropolitan areas, with major cities accounting for significant population growth within states, and New York City and Los Angeles' combined citizenry accounting for 10% of the U.S. population (Mackun & Wilson, 2011). Concerned with urban quality of life, researchers and community planners are seeking to create PSOC in urban areas via public spaces such as parks and civic centers that "serve as symbols of civic pride and sense of place which promote the notion of community" (Talen, 1999, p. 1364). Little is known about the relationship between urban parks and their impact on the social health of communities (Glover, Shinew, & Parry, 2005; Stodolska, Shinew, Acevedo, & Izenstark, 2011) and additional research is needed (Baur & Tynon, 2010). The present research explores the role that urban parks play in fostering PSOC in city neighborhoods as well as the relationship between PSOC and urban park use, frequency of use, and three aspects of proximity: adjacent/non-adjacent to a park, walking distance, and perceived distance.

Literature Review

Social Capital and Psychological Sense of Community

Sense of community is a complex idea, but it can be understood through sociological and community psychology theory. Sociologists developed the concept of social capital that provides a social structural understanding of sense of community (Pooley, Cohen, & Pike, 2005). Bourdieu (1986) argues that social capital is the product of relationships. Individuals and groups make explicit efforts at establishing and maintaining productive connections to each other for some desired outcome. Like Bourdieu, Coleman (1988) conceived social capital as a way to generate personal advantage through the mobilization of social network connections based upon trust and reciprocity. According to Putnam (2000), community social capital is created through civic engagement and trust, both of which increase social capital levels through mutually beneficial relationships among community members. Central to the social capital construct is the notion of a structure of relations out of which resources become available directly or indirectly (Carpiano, 2006). Higher levels of social capital would be indicated by stronger sense of community in a neighborhood where residents know their neighbors, trust them, and feel empowered to rely upon each other for practical and emotional support (Carpiano, 2008; Portes & Mooney, 2003; Wilkinson, 2007; Wilson, 1997).

The community psychological perspective on sense of community, first proposed by Sarason (1974), exhibits overlap with the social capital concept, but rather than focusing on the social structural nature of community relationships, focuses instead on individuals' psychological sense of community. McMillan and Chavis (1986) suggested that PSOC primarily relates to feelings of belonging to a group. McMillan and Chavis distinguished between four dimensions of PSOC: (a) *membership*, (b) *influence*, (c) *integration*, and (d) *shared emotional connection*. Membership is a sense of feeling one has as a member of a group. Influence refers to the importance of an individual to the group and the influence the group exerts upon its members. Integration was seen as an expectation that members' needs will be met by the resources provided by the group. Lastly, shared emotional connection was described as a feeling of shared history within a community. Schweitzer and colleagues (Cantillon, Davidson, & Schweitzer, 2003; Crew, Kim, & Schweitzer, 1999; Schweitzer, Kim, & Mackin, 1999) developed a PSOC scale based on McMillan and Chavis (1986). Schweitzer et al. added safety as a component of PSOC. Safety is especially

important to consider in the present context as it is commonly cited as a reason for not using urban parks (Henderson, 2006; Humpel, Owen, & Leslie, 2002; Stodolska et al., 2011).

Proximity's Role in the use of Urban Parks and PSOC

Park proximity¹ is defined as the distance away from a park, and whether or not that distance affects use of or benefits derived from the park (Anderson, Wilhelm Stanis, Schneider, & Leahy, 2008). Conceptualization of park proximity, its operationalization, and its relationship to park use have varied from study to study (Crompton, 2005; Kaczynski & Henderson, 2007; Nicholls & Crompton, 2005; Walker & Crompton, 2012). Urban park professionals have used distance as a proxy for service area proximity, with the operationalization of distance ranging from a quarter of a mile from a park to a half a mile, depending on the size and extent of a park's service area (Lund, 2003; Mutter & Westphal, 1986).

Proximity and distance to urban neighborhood parks is important to consider because these characteristics impact which neighborhoods are receiving benefits from a park. For example, Anderson et al. (2008) found that distance is a factor mitigating the benefits derived from a recreation site. Similarly, Kearney (2006) found that a view of an urban green area from one's home, in addition to visitation, is related to positive feelings about a neighborhood. Thus, there is some indication that parks and other urban green spaces contribute to community quality of life regardless of visitation (Shafer, Lee, & Turner, 2000; Sullivan, Kuo, & DePooter, 2004).

Urban Park Use and PSOC

Research has revealed that use of urban parks provide opportunities for restoration, social integration, and bonding (Harnik, 2006; Peschardt, Schipperijn, & Stigsdotter, 2012; Sugiyama, Francis, Middleton, Owen & Giles-Corti, 2010). Parks are particularly suited to promoting general social health (Kearney, 2006) and facilitating social interaction among neighbors (Peters, Elands, & Buijs, 2010). Urban planners have utilized parks as physical planning units to increase social cohesion and PSOC in neighborhoods (Cochrun, 1994; Jacobs & Appleyard, 1987; Lund, 2003). Kweon, Ellis, Leiva and Rogers (2010) remarked that the mere presence of natural areas has a strong effect on peoples' evaluation and perception of their neighborhood. However, research on the relationship between urban parks and PSOC has had mixed results (Gidlow & Ellis, 2011; Stodolska et al., 2011) and warrants further investigation. The current study used regression analysis to evaluate the relationship between PSOC and its components and park use and park proximity using Schweitzer and colleagues' definition of PSOC (Cantillon, Davidson, & Schweitzer, 2003), and also used t-tests to compare differences between frequent and infrequent park visitors' perceptions of PSOC.

Methods

Targeted Neighborhoods, Participants, and Data Collection

The data were collected in Norfolk, Virginia. Five parks/neighborhoods were chosen according to amenities conducive for social interaction. Neighborhoods were demographically and socioeconomically diverse. Using Lund's (2003) suggestion, selected blocks were within one half mile radius of each park because of its acceptance in the planning literature as a comfortable walking distance. The surveys and interviews were administered door to door between the fall

¹The history of the concept of proximity has been noted elsewhere (Walker & Crompton, 2012), and it is our intent to be illustrative of the history and development, rather than exhaustive.

of 2004 and 2006 to residents over 18 years old, who had lived in each neighborhood for at least one month. Excluding vacant homes, houses in the service areas totaled 420 on 27 blocks. A total of 119 usable surveys were collected (28.3% response rate).

Instrumentation and Measurement

Interviews lasted 20 to 45 minutes. A total of 20 items were used to measure four dimensions of PSOC (Table 1). Answers were given on a 5-point scale, ranging from 1 (*strongly disagree or definitely not true*) to 5 (*strongly agree or definitely true*). Frequency of park use (*parkuse*) was coded as 0= never/hardly ever, 1= monthly, 2= weekly, 3= several times per week, and 4= just about daily. Proximity to the park was measured by asking the approximate time, in minutes, it takes to walk to the park (*walkpark*), and the perception of whether the park was too far (*toofar*), using the 5-point agreement scale noted earlier. Researchers recorded whether or not there was a physical barrier (e.g., major thoroughfare) separating neighborhoods from a park. The barrier demarcated a neighborhood's proximity as adjacent or non-adjacent to an urban park.

Results

Descriptive Statistics

With the convergence of the scree plot and Kaiser's criterion, four factors were retained in the final analysis, explaining 69.7% of the variance. Table 1 shows the factor loadings and factors after rotation. The items that cluster on the same factors suggest that factor 1 represents emotional connection (EMCN, $\alpha = .93$), factor 2 is integration or met needs (MTND, $\alpha = .91$), factor 3 is block membership (MSHP, $\alpha = .86$) and factor 4 is safety-related block issues (SFTY, $\alpha = .74$).

Demographic characteristics. Out of 119 respondents surveyed, 66.4% were female. Respondents' ages ranged from 16 to 89 ($M = 51.8$). The racial/ethnic background of the respondents was: White (74.0%), Black (19.3%), Latino (0.9%), and Native Americans (1.8%). Additionally, 55.1% considered the quality of life in their neighborhood as high and only 3.4% as low. On average, residents lived on their block 16.6 years, with a range from three months to 64 years.

Use and proximity of urban parks. The frequency of park use of respondents ranged from almost never to daily, with an average value of 0.93, which approximates a monthly use of the neighborhood park. Over half (53.8%) reported never/almost never using their neighborhood parks, whereas 16.8% used parks monthly, 12.4% used parks weekly, 8.8% several times per week, and 6.2% used parks daily. Self-reported walk time to the neighborhood park ranged between 1 and 45 minutes with an average walking time of 7.5 minutes. Approximately 32% reported a walking time of 5 minutes or less to the nearest park.

Regression Analyses

Multiple regression analyses were used to test if *parkuse*, *walkpark*, and *toofar* significantly predicted participants' ratings of PSOC and its dimensions: EMCN, MSHP, and SFTY.² The results of the regression for PSOC ($R^2=.38$, $F(3,96)=11.28$, $p<.0001$) indicated that *walkpark* ($\beta = -.30$, $p<.001$) and *toofar* ($\beta = -.34$, $p<.0001$) significantly predicted PSOC, while *parkuse* ($\beta = .09$, $p=.333$) did not significantly impact overall PSOC. The results of the regression for EMCN ($R^2=.37$, $F(3,96)=18.99$, $p<.0001$) indicated that *toofar* ($\beta = -.56$, $p<.0001$) significantly predicted EMCN, while *walkpark* ($\beta = -.15$, $p=.078$) and *parkuse* ($\beta = .04$, $p=.648$) did not significantly impact EMCN. Results of the regression for MSHP ($R^2=.12$, $F(3,96)=4.49$, $p=.005$) indicated

²Regression analyses for the MTND dimension of PSOC are not included as none of the independent variables were significant predictors of MTND.

Table 1

Four factor Psychological Sense of Community (PSOC) exploratory factor analysis, Maximum Likelihood extraction, Promax Rotation with 25 max iterations (N=119)

Items	<i>M</i>	<i>SD</i>	<i>h</i> ²	Factor Loadings				
				EMCN	MTND	MSHP	SFTY	
<i>Future</i> -residents care about neighborhood's future	3.28	1.47	0.83	0.914	-0.221	0.127	0.116	
<i>Help</i> -when problems, it's easy to get help from neighbors	3.12	1.14	0.85	0.888	0.218	-0.235	-0.034	
<i>Trust</i> -people in neighborhood trust each other	3.16	1.29	0.69	0.838	-0.048	0.042	-0.133	
<i>Isolated</i> - people in neighborhood do not feel isolated	3.15	1.29	0.69	0.835	-0.065	0.015	0.040	
<i>Move</i> -I would not move from this neighborhood	3.26	1.42	0.70	0.819	0.092	0.057	-0.090	
<i>Watchout</i> -people in neighborhood watch out for each other	3.94	0.95	0.69	-0.043	0.735	-0.020	0.185	
<i>Belong</i> -people in neighborhood feel they belong here	3.95	0.81	0.43	-0.049	0.729	0.037	-0.230	
<i>Give ride</i> -people in neighborhood give rides to each other if needed	3.86	0.76	0.57	0.113	0.698	-0.229	0.259	
<i>Connect</i> -people in neighborhood feel connected to each other	3.33	0.91	0.57	-0.047	0.660	0.204	-0.102	
<i>Community</i> -people in neighborhood think themselves as community	3.72	0.97	0.78	0.075	0.579	0.255	0.152	
<i>Know</i> -people in this neighborhood know each other	3.78	0.92	0.56	-0.099	0.562	0.327	-0.272	
<i>Talk</i> - people in neighborhood talk to each other about community	3.64	0.94	0.61	0.096	0.535	0.292	-0.007	
<i>Socialize</i> -people in neighborhood socialize with each other	3.60	0.98	0.67	-0.075	0.060	0.783	-0.015	
<i>Socact</i> -people participate in social activities together	3.28	1.23	0.72	0.070	0.140	0.783	-0.089	
<i>Comintpr</i> -neighbors take part in community improvement	3.39	1.07	0.63	0.091	-0.019	0.687	0.200	
<i>Improve</i> -neighbors help to improve the neighborhood	3.74	1.18	0.50	-0.053	0.051	0.565	0.194	
<i>Crimact</i> -criminal activity in neighborhood is minimal	3.42	0.96	0.41	-0.088	-0.161	-0.108	0.738	
<i>Ohhsafe</i> -compared to other neighborhoods, this neighborhood is safe	3.81	0.90	0.49	0.011	0.041	0.102	0.626	
<i>Safefive</i> -neighbors make neighborhood a safe place to live	3.73	0.91	0.66	-0.095	0.335	0.083	0.516	
<i>Safewalk</i> -it is safe to walk in this neighborhood at night	3.40	1.12	0.32	0.037	-0.102	0.191	0.515	
Eigenvalue				7.298	3.889	1.688	1.064	
% of Variance				36.490	19.445	8.440	5.314	
Cronbach's α				0.928	0.907	0.858	0.735	
Min								
Max								

KMO=0.886, Bartlett's Test of Sphericity is significant at $p < 0.0001$
Note: Factor loadings $> .40$ are in boldface.
EMCN = Emotional Connection Subscale; MTND = Met Needs/Integration Subscale; MSHP = Membership Subscale; SFTY = Safety Subscale

that *walkpark* ($\beta = -.31, p=.002$) significantly predicted PSOC, while *toofar* ($\beta = -.08, p=.403$) and *parkuse* ($\beta = .04, p=.681$) did not significantly impact MSHP. Lastly, results of the regression for SFTY ($R^2=.13, F(3,96)=4.95, p=.003$) indicated that *parkuse* ($\beta = .26, p=.009$) significantly predicted SFTY, while *walkpark* ($\beta = -.18, p=.077$) and *toofar* ($\beta = -.13, p=.194$) did not significantly impact SFTY.

Chi-square and *t*-test Analyses

We separated park users ($n = 55, 46.2\%$) from non-users ($n = 64, 53.8\%$) to see if there were differences in PSOC and its dimensions based on usage. Non-users were coded as “0” if they chose “0” (*never/hardly ever*) as a response and users were coded as a “1” if they chose any other response. There was no significant relationship between gender and users/non-users, $\chi^2(1, N=113) = 1.3, p = .25$. Norfolk park users ($M=3.67, SD=0.53$) had significantly higher PSOC than did non-users ($M=3.37, SD=0.64$), with $t(117) = -2.72, p < .01$. Norfolk park users ($M=3.89, SD=0.59$) had significantly higher MTND than did non-users ($M=3.62, SD=0.76$), with $t(117) = -2.20, p < .05$. Users ($M=3.65, SD=0.86$) had significantly higher MSHP than did non-users ($M=3.27, SD=1.02$), with $t(117) = -2.18, p < .05$. Lastly, park users ($M=3.91, SD=0.48$) had significantly higher sense of SFTY than did non-users ($M=3.45, SD=0.82$), with $t(117) = -3.75, p < .0001$. No significant differences were found related to EMCN and users/non-users.

Although the data met the assumptions of performing an independent samples *t*-test, the n ($n=39$) of respondents whose home was separated from a park by a barrier (e.g., a major road) was substantially lower than the n of the adjacent group ($n=80$); however, Levene’s test found no violation of homogeneity of variance ($p = .736$) between the two groups. The *adjacent* group ($M=3.66, SD=0.59$) was significantly higher in their PSOC than the *barrier* group ($M=3.22, SD=0.55$), with $t(117) = 3.95, p = .0001$. The *adjacent* group ($M=3.42, SD=1.18$) was significantly higher in their EMCN than the *barrier* group ($M=2.73, SD=1.01$), with $t(117) = 3.11, p = .002$. Lastly, *adjacent* group ($M=3.73, SD=0.81$) was significantly higher in their MSHP than the *barrier* group ($M=2.89, SD=1.02$), with $t(117) = 4.86, p = .0001$. No significant differences were found related to MTND or SFTY in *adjacent/barrier* groups. Additionally, there was no significant relationship between adjacent/non-adjacent and users/non-users, $\chi^2(1, N=119) = .000, p = .99$.

Discussion

Implications

PSOC and park use. Our findings indicate a significant relationship between park use and safety on the block. Either parks engender safer neighborhoods, or neighborhoods have to be safe for people to use the parks. Thus, we concur with previous research on the matter of safety and park use (Henderson, 2006; Stodalska et al., 2011). In previous studies, it was found that leisure can strengthen social trust via recreation activities involving onsite social interaction in outdoor settings (Glover, 2004; Glover et al., 2005).

Park administrators in Norfolk should encourage community outreach programs that help establish connections between people in the neighborhood and the parks, thereby encouraging community ownership of the parks. This could be accomplished by working with neighborhood organizations, civic leagues and local advocacy groups to establish community block parties, programming, or cleanups in neighborhood parks. Engagement at this level may lead to increased sense of safety and social trust, as well as the establishment of “natural guardians” of the neighborhood park giving rise to safer and stronger neighborhoods (Hilborn, 2009).

The regression analysis indicates no significant prediction of *parkuse* and overall PSOC; we suspected this was due to over half the sample not using parks. Users of urban parks had higher PSOC than non-users. Although the frequency of usage did not have an impact on PSOC, using the parks in some capacity (over not using them at all) has some influence on PSOC, which corroborates previous research (Cochrun, 1994; Jacobs & Appleyard, 1987; Kweon et al., 2010; Lund, 2003). In addition to urban park users having significantly higher PSOC than non-users, park users also experience higher neighborhood needs being met, a higher sense of membership in the neighborhood, and a higher sense of safety over non-users—a further argument for park advocacy.

PSOC and proximity. We explored the relationship between subjectively-rated proximity and PSOC to find out if perceived distance (*toofar*) or reported walking distance to the park (*walkpark*) had any association with PSOC. Our assumption in testing these relationships reflected Kearney's (2006) notion of opportunities for park visitation and views of nature and Shafer, Lee and Turner's (2000) notion of being able to see natural areas. We found support for the relationship between both aspects of proximity and PSOC. Both *toofar* and *walkpark* significantly impacted overall PSOC, indicating that the closer to the park, and the less time it takes to get to the park, the greater the overall PSOC.

These findings relate to Lackey and Kaczynski's (2009) suggestion that aesthetics of the urban park (destination) and the walk to the park itself may be variables of interest. Further indication that proximity to a park increases sense of community in a neighborhood came from our findings indicating that adjacent residents were significantly higher in their overall PSOC, feelings of neighborhood membership, and that the neighborhood was meeting their needs, than those residents experiencing some physical barrier to using the neighborhood park. Our results are consistent with previous research (Walker & Crompton, 2012). Facilitating greater access to Norfolk parks via urban design for users, or greater park information dissemination regarding the benefits, location, and amenities for non-users, will create more use, safer neighborhoods, and greater overall PSOC. Admittedly, we acknowledged that if one lives closer to a park, one is apt to use the park more than one who lives further away. However, the chi-square analysis indicated no relationship between use/non-use and adjacent/non-adjacent areas.

Limitations

Considering our sample size, statistical analyses and interpretation must be viewed cautiously. While we had an adequate representation regarding gender, our sample was overrepresented by Whites and those with higher incomes and education. Arguably, this has an effect on generalizability beyond these neighborhoods, and should be viewed as a case study, especially given our low response rate. The study is also limited to the exploration of PSOC variables and does not consider park use in the context of other popular recreation theories, such as social contact theory. We also recognize the limitations on how we operationalized proximity, and the issues related to inclusion of streets only within the park service area, given residents could use parks outside of their neighborhood (Anderson et al., 2008; Kaczynski & Havitz, 2009; Walker & Crompton, 2012). Related to this, blocks containing schools, apartment buildings, and religious organizations were excluded from the study. While we recognize that this would provide a unique perspective on park use, exclusion of blocks with these characteristics was due to accessibility (i.e., being buzzed into apartments) and safety concerns, as well as the potential influence of community institutions (schools, religious, or social organizations) on the recreation and leisure patterns in the neighborhood, and the recognized influence they have on neighborhood sense of community (McMillan & Chavis, 1986), at both the individual and community level (Brodsky, O'Campo, & Aronson, 1999).

Future Research

Two years after the completion of our study, Chavis, Lee, and Acosta (2008) created a revised SCI-2, which addressed previous concerns regarding the original SCI, but did not incorporate a safety component in the revision. Our recommendation for future researchers is either to use the current scale we created for purposes of cross-validation, or use the SCI-2, but add the additional safety component when assessing PSOC in neighborhoods. Future studies should explore the role of walking in the neighborhood, enjoyment of urban green space, and the impact this has on PSOC. Exploration of walking in neighborhoods and urban parks could bridge the recreation and social health research with recent contributions to recreation and physical health (Kaczynski & Henderson, 2007; Kaczynski & Havitz, 2009; Mowen & Confer, 2003; Mowen, Orsega-Smith, Payne, Ainsworth & Godbey, 2007). Future studies should also consider the inclusion of perceived recreation benefits and other variables, such as length of time living within the neighborhood. Gómez and Malega (2007) found perceived benefits of recreation to be a critical and often ignored precursor to participation. Additionally, Anderson et al. (2008) noted that benefits differ by distance from the recreation site, and studies support a relationship between length of time living in a community, and knowledge of recreational opportunities.

Conclusions

The premise for this study began with the notion that the U.S. will continue to be more urbanized, and that densely populated cities are more likely to have lower sense of community in their neighborhoods than suburban areas. Given the urbanization trend, more studies are needed on urban parks and residents. We sought to complement current research on healthy living and physical activity and urban parks, with an exploration into social aspects of neighborhoods and urban parks. This study explored the relationship between urban parks and psychological sense of community. The analyses reinforce the need to include a safety dimension when researching neighborhood PSOC. The relationship between urban park use and PSOC was supported only for the safety dimension. However, park users were significantly higher in their PSOC than non-users. Both aspects of proximity (perceived distance, and reported distance) in this study were significantly related to PSOC. Furthermore, proximate (adjacent to the park) residents were stronger in PSOC than distant (nonadjacent/barrier) residents.

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