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Constraints to Outdoor Recreation: A Multiple Hierarchy Stratification Perspective

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A multiple hierarchy stratification perspective was adopted to investigate outdoor recreation constraints for 3,000 Texans interviewed by telephone in 1998. This theoretical perspective contends that individuals' socio-demographic characteristics are accorded a position in society relative to others and that this position effects the individual's access to services. Logistic regression models tested whether nine outdoor recreation constraints were important to respondents based on age, gender, race/ethnicity and SES. With the exception of time constraints, all other outdoor recreation constraints were most important to elderly, female or minority respondents with lower SES. The probability of experiencing constraints to outdoor recreation is multiplied when respondents had more than one of these statuses. Implications for theory development, outdoor recreation, and service provision are discussed.

Keywords constraints, logistic regression, multiple hierarchy stratification, outdoor recreation, status characteristics

The publication of the state of knowledge text *Constraints to Leisure* (Jackson, 2005) made evident the rapid increase of leisure constraints research. In this text and others (e.g., Jackson & Scott, 1999), the rise in the popularity of constraints research was credited in part to the ability of this research to inform theory in diverse topical areas. For example, constraints research has informed content areas such as outdoor recreation, adolescent leisure, and racial inequality in leisure. Researchers, however, have articulated a need to move beyond the study of individual content areas and bridge gaps among topic areas in constraints research. Specifically, Crawford and Jackson (2005) called for the development of theory to

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investigate the extent to which constraints and negotiation strategies vary systematically by gender, socioeconomic status and other factors. This sentiment was echoed by others who called for theory to describe the multiple systems of inequality (McKay, Messner, & Sabo, 2000) and consider how multiple identities such as gender, race, social class and residence interact and influence leisure preferences (Shinew & Floyd, 2005).

In our study, we built links between four topical areas in constraints research (gender, age, socio-economic status and race/ethnicity) to understand the lived experience of constraints. Since all individuals have multiple status characteristics, we investigated how combinations of statuses affected individuals' constraints to outdoor recreation. By adopting multiple hierarchical stratification as a theoretical perspective/paradigm to guide this research, we addressed the identified need for theory linking content areas in constraints research. In addition, we evaluated the utility of this theoretical standpoint as an overarching perspective to guide the study of outdoor recreation constraints. Last, we sought to extend an understanding of these macrolevel factors known to effect outdoor recreation constraints (Walker & Virden, 2005).

Review of Related Literature

Theoretical Perspective

Recreation constraints are not equally distributed across society, and socio-demographic characteristics play a role in the prevalence and extent of constraints (Jackson, 2005; Jackson & Henderson, 1995; McGuire & O'Leary, 1992; Scott & Munson, 1994; Searle & Jackson, 1985). According to Henderson and colleagues (1996), constraints to leisure may be more acute for people who are in non-dominant groups. Life chances, including recreation opportunities, are shaped by various statuses and roles (Szmatka, Skvoretz, & Berger, 1997). All people have status characteristics that shape their perceptions, opportunities and interactions in daily life.

Multiple hierarchy stratification is a theoretical perspective based on the idea that every person has a position or status in society. According to Lovaglia (2000), "Status position in society is relative to others and arranged in layers. Thus, status positions are not just different from each other; they are ranked" (p. 131). The three most prevalent status characteristics are gender, race and age (Szmatka et al., 1997). In the context of the present day United States, the highest status is accorded to young adults, males, Whites and people at the high end of the socio-economic hierarchy (Jagrowsky, 1996; Yinger, 1993). These status characteristics, along with level of education and income, function as diffuse status markers. These characteristics are labeled diffuse because people use them to judge others' competencies and worth regardless of whether or not these factors are related to the task at hand. Likewise, diffuse status characteristics are highly related to various aspects of behavior, including group interactions, self-presentation, as well as athletic and academic goal setting and achievement (Berger & Fisek, 2006; Lovaglia, 2000; Riordan, Griffith, & Weatherly, 2003). In our study, we focused on how diffuse statuses are related to constraints to participation in outdoor recreation.

The notion that status characteristics are important to a person's social position provides the basis for a multiple hierarchy stratification perspective. While conceptually linked to other sociological theories such as status characteristic and social structural theories, multiple hierarchy stratification has developed as a distinct theoretical perspective. This perspective is supported by published scientific literature that is empirically rooted in the double jeopardy hypothesis. The double jeopardy hypothesis uses two status variables, such as race and gender, to understand why some people are hindered in their access to resources

(Beale, 1970; Klonoff, Landrine, & Scott, 1995; Reid & Kelly, 1994). Multiple hierarchy stratification perspective extends this idea to include two additional status variables. These four statuses (SES, age, gender and race/ethnicity) provide a more complete portrait of an individual's social position and status factors that *jointly* affect an individual's life chances.

According to Markides, Liang and Jackson (1990), the multiple hierarchy stratification perspective was developed to understand how multiple disadvantageous statuses compromised access to a range of public service offerings including leisure resources. When interpreted as a testable theory, multiple hierarchy stratification states that since older females who are poor and members of a minority group represent the lowest end of the stratification hierarchy, they should have the most constraints to service access. In contrast, young, affluent white males represent the high end of the stratification hierarchy and should encounter the fewest constraints to accessing services.

Some studies have used multiple hierarchy stratification to explain leisure preferences (e.g., Shinew et al., 1995), leisure benefits (e.g., Phillip, 1999), and leisure participation (e.g., Cutler Riddick & Stewart, 1994; Floyd et al., 2006; Lee, Scott, & Floyd, 2001). To our knowledge, only one study has employed multiple hierarchy stratification to understand leisure constraints. Arnold and Shinew (1998) adopted this theoretical perspective to analyze the relationship of three diffuse status characteristics (gender, race and income) to participation constraints in a large metropolitan park. Our study investigated how four status characteristics (SES, age, gender, and race/ethnicity) interacted to effect outdoor recreation constraints.

Although multiple hierarchy stratification has been employed little in leisure research, several studies have addressed the relationship of leisure constraints and individual status characteristics. We review these studies after a brief introduction to outdoor recreation constraints.

Constraints to Outdoor Recreation

Constraints are "factors that limit people's participation in leisure activities, people's use of leisure services, or people's enjoyment of current activities" (Jackson & Scott, 1999, p. 301). Constraint research has identified factors that inhibit leisure participation and satisfaction. In this effort, typologies have been introduced that classify constraints to leisure.

The most recognizable of the classification schemes was introduced by Crawford, Jackson, and Godbey (1991). The authors presented constraints as structural, interpersonal and intrapersonal factors that operate in a hierarchy, with intrapersonal constraints being the most proximal and powerful. Stodolska (1998) suggested a different approach. She reasoned that constraints could be conceptualized in two categories according to their temporal nature. Accordingly, Stodolska described some constraints such as discrimination or a lack of access to resources as "static" characteristics because they remained relatively stable over time. Other constraints are "dynamic" and include mutable factors such as lack of familiarity, childcare responsibilities, weather and language proficiency. More recently, Walker and Virden (2005) presented a constraints classification specific to the study of outdoor recreation. They proposed a four-part taxonomy of structural constraints labeled:

1. natural environment structural constraints,
2. social environment structural constraints,
3. territorial structural constraints, and
4. institutional structural constraints.

Moreover, Walker and Virden summarized findings from four large data sets in North America. Across all four studies, outdoor recreation was strongly constrained by a lack of

information, crowding, distance to the recreation area, family commitments, family members in poor health, expense and a lack of companion for outdoor recreation participation. Fear of crime, lack of equipment, high admission fees and poorly maintained facilities and equipment were moderately important constraints to outdoor recreation.

In addition to identifying major constraints to outdoor recreation and proposing a schema for their classification, Virden and Walker (1999) proposed a model of how constraints operate to impact participation. Key components of this model are the recognition that outdoor recreation involves an ongoing interaction with the environment, the notion that constraints are impacted by macro and micro-level factors, and the inclusion of constraint negotiation as a two-stage process. Our study provided information about how macrolevel factors are related to each of nine constraints to outdoor recreation.

Association of SES and Constraints

Researchers linking SES and leisure constraints have consistently documented a greater intensity of constraints among individuals with lower incomes and lower levels of education. For example, a study by Brown et al. (2001) highlighted the role of income in predicting respondents' constraints. This study of 543 mothers of young children identified wide variations in time spent each week in active leisure within groups of varying socioeconomic status. In a study of outdoor recreation constraints, Scott and Munson (1994) observed that people with low incomes perceived far more constraints to park visitation than people with high incomes. Income was also a stronger predictor of perceived constraints to park visitation than sex, age, race and level of education.

Searle and Jackson's (1985) study of the effects of barriers on individuals' desire to participate in a new recreation activity found constraints were related to level of income. Within Searle and Jackson's sample of Canadian citizens, poor respondents were likely to be effected by constraints to participation. For example, work commitments were more likely to effect participation of poorer respondents. Alexandris and Carroll (1997) also reported that the perception of constraints significantly increased among less-educated individuals.

Association of Age and Constraints

To describe the relationship of age and outdoor recreation constraints, we must understand the financial position of U.S. seniors. Although aging adults are healthier and wealthier than in previous generations, more than 20% of older adults living alone fall below the poverty line. This figure increases for African American (22.3%) and Hispanic (38%) women. For seniors who are not impoverished, a reduced income resulting from retirement and reliance on fixed income from social security may constrain expenditures on leisure and recreation.

In addition to constrained incomes, poor health can influence outdoor recreation participation. The Administration on Aging (*A profile of older Americans*, 2002) indicated that 28.8% of Americans between the ages of 65 and 74 limited their activity participation due to a chronic health condition. Further, poor health not only affects participation for the unwell individual, but may also constrain family and friends by limiting transportation, finances, and available partners, and increasing time spent giving care.

Constraints increase with age as observed across contexts including tourism, physical activity participation, park visitation and attendance at special events. For example, Wang, Norman, and McGuire (2005) identified more constraints to visiting Wisconsin's Northwoods among respondents over age 50 compared to younger respondents. Scott and Jackson (1996) reported that poor health, a lack of companions and a fear of crime were more likely to constrain older adults from visiting local parks.

Association of Gender and Constraints

Although constraints affect both women and men, scholars have shown a particular interest in the consequences of constraints for women's leisure. Among the reasons for this emphasis is recognition that women often encounter more constraints than men, women often experience different constraints than men, and men have historically been the subjects of empirical research (Henderson et al., 1996).

Research on the association of gender and constraints described differences in both the quantity and nature of constraints by gender. Regarding quantity, researchers concluded that women were slightly more constrained in their leisure than men (Harrington & Dawson, 1995; Jackson & Henderson, 1995). According to Shaw and Henderson (2005), time stress and a lack of time for one's self are major constraints on women's leisure. While a lack of time can be an intrapersonal constraint, empirical evidence suggested that time is also a structural constraint for women. Women's time scarcity results because women continue to shoulder the majority of household responsibilities regardless of employment outside the home (Hochschild & Manchung, 1990; Pittman et al, 1999). Further, caring behavior may lead women to prioritize others' leisure before their own (Daly, 1996; Harrington & Dawson, 1995; Herridge, Shaw, & Mannell, 2003).

Some research has focused on the relative intensity of constraints for women and men, while other research has described differences in how women and men experience constraints. Among the studies about outdoor recreation, women's heightened fear of crime is the most prevalent difference between sexes. Women were more likely than males to cite fear of crime or victimization as a constraint to visiting parks and recreation areas in urban areas (Riger & Gordon, 1981) and in natural, forested environments (Virden & Walker, 1999). In addition, a fear of crime often alters how or when women participate in outdoor recreation. Women have reported a reluctance to go out on their own after dark or hike alone in forested or shadowed areas (Bialeschki, 2005; Carr, 2000; Whyte & Shaw, 1994).

Women's participation in outdoor recreation may also be constrained in other ways. Researchers have explained nonparticipation among women in terms of females' concerns with body image and appearance, concerns about their skill level, and fear of embarrassment by not fitting in (Frederick & Shaw, 1995; Henderson & King, 1998; James, 2000; Shaw, 1992). Additionally, embarrassment can reduce the desire to participate in leisure when peers deem an activity inappropriate for men or women. For example, Culp (1998) observed that family and peer beliefs about gender roles constrained girls who were interested in outdoor recreation.

Another important constraint for women is a lack of money for outdoor recreation. Deem (1986) was one of the first researchers to identify economic dependency as a structural constraint to many women's leisure. Without an income of their own earning, Deem observed that women were reluctant to spend money on personal leisure.

Association of Race/Ethnicity and Constraints

A number of studies have shown that ethnic and racial minorities experience more constraints to leisure and outdoor recreation than non-minorities. Attempts to explain this disparity have investigated economic factors, a history of discrimination and exclusion, and cultural factors (Stodolska & Yi-Kook, 2005).

First, the socio-economic status of minorities may help explain the higher prevalence of constraints among these groups. Inequities in family income persist and may constrain leisure among people of color. While the gap between the median incomes of Blacks and Whites has been reduced, Black families still earn 63% of what white families earn (U.S. Census Bureau, n.d.). Related to SES status are access and transportation constraints.

Gobster (2002) observed that Latino and Asian recreationists were constrained by physical distance and transportation problems to access the well-developed and well-maintained parks in Chicago. Similarly, West (1989) attributed lower participation among African Americans in Detroit's regional parks to transportation constraints. In addition, work demands and physical exhaustion have been described as potential constraints to outdoor recreation among minorities. Crespo (2000) noted that minorities in general and Hispanics specifically were more likely to be employed in occupations that required higher energy expenditures compared to Whites, which can potentially explain their lower rates of participation in physically active recreation.

Although the importance of structural factors should not be overlooked, interpersonal constraints to outdoor recreation identified have included a fear of crime, perceived discrimination, and the sanctioning of activities as acceptable by peers and family. Johnson, Bowker, and Cordell (2001) found that African Americans were more likely than Whites to report that safety concerns deterred their participation in outdoor recreation activities. A fear of crime at recreation sites was linked to a perception of discrimination. Both Hibbler and Shinew (2002) and Phillip (2000) documented the perception of racial discrimination at leisure sites. An early study by Woodard (1988) examined the extent to which African Americans' social class and regionalism related to the perception and fear of racial prejudice, discrimination, co-racialism, and criticism about leisure participation. While Woodward focused on metropolitan outings, informal domestic activities, and nightlife activities, his findings highlighted the importance of discrimination as a constraint to leisure participation. Focus group data reported by Blahna and Black (1993) revealed four specific forms of on-site discrimination in outdoor recreation experienced by Hispanic and African American college students in Chicago area parks and forest preserves. Students' responses most closely associated with on-site experience were discrimination from other recreationists, from managers or staff, differential upkeep and maintenance of park facilities, and fear of possible discrimination and racism. More recently, Gobster's (2002) study of participation at Lincoln Park in Chicago found racial discrimination was a problem for some park users. One in seven African Americans reported racial discrimination and responded to in a range of ways: feelings of discomfort, reduced enjoyment, and anger as well as altered participation (i.e., displacement, non-use).

In addition to discrimination, researchers (Phillip, 1999; Washburne & Wall, 1980) described how social organizations may sanction particular activities as "black" and "white." Minority group members are either encouraged or discouraged from participation to protect them from additional discrimination that may come from interracial contact in "white" activities (Washburne & Wall, 1980). In two studies, Phillip examined the appeal of activities to Whites and African Americans (Phillip, 1995) as well as their perceived "welcomeness" in several leisure pursuits (Phillip, 1999). The appeal of activities was significantly different by race. African Americans reported feeling significantly less comfortable in half of the activities and unwelcome in activities they perceived as "white" activities.

Beyond frequently documented constraints, the design of recreation facilities may constrain outdoor recreation. Irwin, Gartner, and Phleps (1990) and Gobster (2002) found that Hispanics tended to recreate in larger groups at outdoor recreation sites. Given the design of most American campgrounds and park facilities, a lack of adequate facilities for preferred group sizes may constrain Hispanics' outdoor recreation participation. Similarly, a lack of family-oriented facilities and programs can constrain Muslim-American participants who require single-sex facilities, spaces for communal meetings, and private space for daily prayers (Stodolska & Livengood, 2003). Also, an absence of local kinship ties may constrain outdoor recreation participation among racial and ethnic groups who rely heavily on these ties for social outings and for childcare that enables outings (Stodolska & Yi-Kook, 2005).

Purpose of the Study and Hypotheses

Despite an emerging understanding of how status characteristics are associated with recreation constraints, little is known about how *a combination of statuses* is related to the perception of outdoor recreation constraints. Our paper advances this knowledge by describing how four status characteristics predict respondents' perceived constraints to outdoor recreation. In a previous study, Lee et al. (2001) demonstrated the utility of the multiple hierarchy stratification perspective for understanding outdoor recreation participation among Texans. Our study extends these findings by examining the utility of multiple hierarchy stratification for the study of constraints. Using the same sample of Texas residents, we employed this theoretical perspective to understand the relationship of status characteristics and perceived constraints to outdoor recreation. Logistic regression was used to describe the degree to which SES, age, gender, and race/ethnicity predict the perception of nine constraints to outdoor recreation.

We hypothesized first that respondents who were lower SES, female, older age, and minority race would be more likely to ascribe importance to the nine different outdoor recreation participation constraints than respondents with advantageous status characteristics. Second, we examined the combined effect of SES, age, gender, and race on the prevalence of outdoor recreation constraints. We expected that individuals who occupied the highest end of the status hierarchy would be significantly less constrained by each of the nine constraints to outdoor recreation than respondents in the lowest end of the status hierarchy. Finally, in a departure from previous research using this theoretical perspective, we chose to interpret multiple hierarchy stratification as a testable theory. Thus, we hypothesized that the interaction of each status variable would be a significantly better predictor of each outdoor recreation constraint than the sum of the parameters for each independent variable. In other words, we tested the basic tenet of this theoretical perspective that the effects of status would be multiplied and arranged in a hierarchy.

Methods

Data for this study were from 3,000 computer-aided telephone interviews collected in Texas during 1998. Respondents were randomly selected from each of the ten economic regions identified by the Texas State Comptroller. The sample was apportioned such that each region would have 300 respondents. The survey asked respondents about their outdoor recreation participation, constraints to outdoor recreation participation, and demographic information. Response rates ranged from 57% to 67% across the 10 regions of Texas. The data were weighted according to demographic characteristics within each region.

Nine dependent variables were analyzed. In the original telephone interview, respondents were asked about their perception of 19 different constraints. For our study, a sub-set of these constraint items were selected for analysis based on previous literature that had identified relationships between these constraints and individual status characteristics. The nine constraints included: "Parks and recreation areas are too far away," "The cost is too high," "Don't know where parks and recreation areas are," "A lack of time," "Don't have people to go with," "Being afraid of getting hurt or being attacked," "Family members or you have been in poor health," "Not interested in outdoor recreational activities," and "Don't approve of activities that others might be doing." Respondents were asked, "How important is each factor in your decision to leave home for outdoor recreation?" Response categories were "very important," "somewhat important," or "not important at all." Since we adopted binary logistic regression for analysis, the three response categories of constraint were recoded into two responses: responses of "somewhat important" and "very important"

were combined into one category. Thus, constraints are discussed as either “important” and “not important.”

Binary logistic regression helped understand the relationship between study variables. Logistic regression is particularly useful to determine the probability of an event happening (Hamilton, 1992). Further, this analysis allowed us to place respondents in a hierarchy based on status characteristics. The methodology helped us understand how groups of constituents with multiple status characteristics were likely to be constrained in outdoor recreation. For example, we were able to calculate the probability of an elderly Black woman perceiving transportation constraints and compare this finding to the likelihood of an elderly White male reporting these same constraints. By comparing different strata within the stratification hierarchy, we predicted the prevalence of outdoor recreation constraints for multiple sub-groups of the population.

Five independent variables were included for analysis (i.e., race/ethnicity, gender, age, income, and education) to represent the four variables necessary to test the multiple hierarchy perspective (race/ethnicity, gender, age, SES). Two variables were entered to analyze race/ethnicity: Black and Hispanic. White respondents were the reference category for both variables. Although this approach differed from Lee et al. (2001) who categorized respondents as either majority (White) or minority, using two racial categories allowed us to examine the differential effects of Hispanic ethnicity and African American race on outdoor recreation constraints. Gender was entered into the regression equation as one variable with male serving as the reference category. Age was entered as four variables. Adults 65 years or older served as the reference category for each of three comparison variables: respondents 18–24 years, 25–45 years, and 46–64 years. SES variables were recoded into two groups. Level of education was measured with one dichotomous variable. Respondents who had completed college were the reference category for respondents who had not completed a bachelor’s degree. Income was entered as four variables. An income of \$70,000 or more per year served as the reference category for three comparison variables: incomes less than \$20,000, incomes from \$20,000 to \$39,999, and incomes from \$40,000 to \$69,999.

Data Analysis

Data analyses were undertaken in four stages.

1. Respondent characteristics were described using frequency statistics.
2. Analysis of the individual effect of each independent variable on the nine constraints was examined. As described, logistic regression was used to predict the likelihood of each constraint according to each individual status characteristic.
3. Logistic regression results were used to identify the likelihood that each constraint was important for respondents with a combination of statuses. With five study variables, 120 variable combinations were possible. These 120 variable combinations resulted in 120 different strata predicting nine constraints, which required 1080 regression parameters. To simplify results interpretation and minimize error rate for analysis, an abridged probability table displays seven strata selected for analyses. To begin, the probability of perceiving each constraint was described for respondents with advantageous statuses for all five variables of interest. For each subsequent stratum, one disadvantageous characteristic replaced one advantageous characteristic. Therefore, the sixth and seventh strata represented the likelihood of perceiving outdoor recreation constraints for respondents with low levels of income and education, and who were older, female, and of a minority race/ethnicity.

4. The multiple stratification hierarchy perspective was interpreted and tested as a theory. Thus, we tested whether the effects of disadvantageous statuses multiplied when combined. We expected that adding additional stratification variables would create an interaction effect that would increase the perception of constraint beyond the individual effects of each variable. Although logistic regression does not test this relationship by default, a custom hypothesis using l and k matrices was entered into the regression syntax. We hypothesized that the interaction of each status variable would be a significantly better predictor of each outdoor recreation constraint than the sum of the parameters for each independent variable. [Hypothesis: $\text{Logit}(\pi) = \alpha + \beta_{\text{INC}} \times \text{EDUC} \times \text{SEX} \times \text{AGE} \times \text{RACE} > \text{Logit}(\pi) = \alpha + \sum (\beta_{\text{INC}}, \beta_{\text{EDUC}}, \beta_{\text{SEX}}, \beta_{\text{AGE}}, \beta_{\text{RACE}})$.] This custom test assessed whether the effects of statuses were “true” combination effects.

Results

Characteristics of Respondents

When asked about their race/ethnicity, approximately two-thirds of respondents self identified as White (65%). Hispanic respondents comprised 24% of the sample, and 8% of respondents reported they were Black. Respondents who identified themselves as another race (3%) were not included in the analysis. With regard to SES, most respondents had not completed college (70%). Respondents also reported a wide range of incomes. About 35% of interviewees reported earning less than \$20,000 per year, and another 34% reported annual family incomes of \$20,000–40,000. About one in ten respondents indicated a family income of \$70,000 or greater. Overall, slightly more women (53%) than men (47%) completed the telephone questionnaire. Respondents ranged in age from 16 to 83, with most respondents 25 to 45 years (41%). Another 29% of respondents were 46 to 65 years.

Individual Effect of SES, Age, Gender, and Race/Ethnicity Variables on Constraints

The first hypothesis was tested by investigating the extent to which the four status characteristics affected respondents’ perceived constraints to outdoor recreation. A series of multiple logistic regression models examined the prevalence of outdoor recreation constraints according to *individual* independent variables. Table 1 presents these results and shows the estimated effects of SES, age, gender, and race/ethnicity on the probability of experiencing any constraint to outdoor recreation.

Results from the nine regression models supported the first study hypothesis: For 29 of 36 significant relationships, the disadvantageous status characteristic was significantly related to an increased perception of constraints. For example, having an income less than \$20,000 per year was related to a significantly greater perception of economic and transportation constraints. When significant, constraints related to a lack of transportation, lack of partner, a fear of crime, health problems, and disapproval of what others may be doing were more important to respondents with disadvantageous status characteristics. On the other hand, time constraints were more important to respondents with advantageous status characteristics.

The association of individual status characteristics and outdoor recreation constraints conformed to expectations based on the literature review. Regarding gender, female respondents were significantly more likely to report that a fear of crime was important to their decision to leave the home for recreation. Race was significantly related to five of the nine constraint variables (i.e., transportation, economic, fear of crime, poor health, or disapproval of others). In each case, Black respondents were more likely than White respondents to report each constraint as important to their decision to leave home for recreation.

TABLE 1 Logistic Regression Estimates of the Individual Effects of SES, Age, Gender, and Race on Outdoor Recreation Participation

	Transportation (N = 2338)	Economic (N = 1995)	Knowledge (N = 2005)	Time (N = 2007)	Partner (N = 2332)	Fear (N = 2440)	Health (N = 2005)	Interest (N = 1980)	Disapproval (N = 2007)
Education									
1 = college grad	1.599* (-.469)	1.405* (-.340)	2.028** (-.707)	1.842* (.712)	1.096 (.091)	.722 (-.162)	1.412 (.345)	0.986 (-.014)	.969 (-.032)
Income									
1 < \$20,000/yr	2.588** (.951)	1.971** (.862)	1.038 (.037)	0.795 (-.230)	1.346 (.297)	1.258 (.229)	1.258 (.230)	.860 (-.151)	1.280 (.247)
1 = \$20-39,900/yr	1.399 (.336)	1.297 (.260)	1.040 (.039)	1.093 (.089)	1.163 (.151)	1.107 (.102)	1.238 (.213)	.924 (-.079)	1.280 (.247)
1 = 40-69,900/yr	1.065 (.129)	1.079 (.076)	1.036 (.038)	1.241 (.902)	1.241 (.098)	1.502 (.407)	1.312 (.210)	1.231 (-.041)	1.478 (.391)
Age									
1 = Age 18–25	1.556* (-.505)	1.298 (.261)	2.208* (.707)	4.969** (1.603)	0.588* (-.530)	1.260** (-.231)	.206** (-.1582)	.787 (-.239)	1.171 (-.158)
1 = Age 26–45	1.477* (-.490)	1.747** (.558)	1.800* (.829)	8.690** (2.162)	.589* (-.530)	.976* (-.204)	.269** (-.1.313)	.707 (-.347)	1.026 (.026)
1 = Age 46–64	1.440* (-.043)	1.586 (.461)	1.666* (.510)	3.771** (1.327)	.698 (-.359)	.647* (-.436)	.624* (-.471)	1.004 (.004)	1.233 (.209)
Gender									
1 = female	1.257 (.229)	1.310 (.270)	1.216 (.195)	1.010 (0.010)	1.247 (-.221)	1.348* (.299)	1.063 (.062)	1.079 (.076)	1.043 (.042)
Race									
1 = Black	2.139** (.826)	1.649* (.500)	1.316 (.275)	.512 (-.669)	1.060 (.058)	2.182** (.780)	1.507* (.568)	1.363 (.309)	1.409* (.343)
1 = Hispanic	2.038** (.712)	1.650** (.501)	1.858* (.620)	0.870 (-.139)	1.353 (.303)	2.252* (.812)	1.560* (.445)	1.175 (.162)	1.274 (.242)
Model G ² /df	71/9*	81/9*	56/9	123/9*	19/9	246/9*	1137/9*	69/9	89/9
% Correct Prediction	74.5	78.7	70.1	76.9	65.8	83.1	69.8	63.6	77.2

Logistic regression coefficient ** < .01; * p < .05, (Odds ratio in parentheses), (Binary Dependent Variable, 1 = Constraint is “important.”)

Similar to Black respondents, Hispanic respondents reported higher levels of transportation, economic, knowledge, fear of crime, and health constraints than did Whites. For education and age variables, both advantageous and disadvantageous statuses were linked to increases in reported constraints to outdoor recreation. While college-educated respondents were significantly *less* likely than non-graduates to report transportation, economic, or knowledge constraints, college graduates perceived that time was a significantly *more* important constraint than did non-graduates. Similarly, respondents who were younger than 65 years ascribed *less* importance to transportation, a lack of partner, fear of crime, and health constraints but *more* importance to time and knowledge constraints than did older respondents.

When results were analyzed by constraint type instead of by status characteristic, we observed that a lack of transportation was significantly related to 7 of 10 status variables. A fear of crime was significantly important for 6 of 10 status characteristics. For economic, knowledge, time, and health constraints, 5 of 10 status characteristics registered significant differences. Two of 10 statuses were significantly related to a lack of partner, and just one status was important related to disapproval constraints. No status variables were significantly related to a lack of interest in outdoor recreation.

Combined Effect of SES, Age, Gender, and Race/Ethnicity Variables for Constraints

After the independent effects of SES, age, gender, and race on outdoor recreation constraints were described, the combined effects of these independent variables were examined in an abridged probability table. Table 2 describes the mean probability of experiencing outdoor recreation constraints for seven selected strata. In the first stratum, the probability of a college-educated, White male, under age 65, and earning more than \$20,000 each year experiencing each of the nine constraints was computed. In each subsequent stratum, one advantageous status characteristic was switched to a disadvantageous characteristic. Thus, the sixth and seventh strata in the abridged probability table show the probability of a constraint as important for female minority respondents (i.e., Hispanic and Black, respectively) who were over age 65, did not have a college education, and reported family incomes below \$20,000.

Table 3 presents the probability that each constraint was important for individuals with different statuses. Results suggest, on average, that respondents in stratum 7 were more likely to perceive constraints to outdoor recreation than were respondents in stratum 1. For seven of the nine dependent variables, the second hypothesis was supported: Seven of the nine constraints investigated were most important to respondents in the lowest two strata. In particular, older Hispanic women with lower incomes and a lower level of education were most likely to experience transportation ($\rho = .48$), knowledge ($\rho = .35$), and fear constraints ($\rho = .66$). Older Black women with the same levels of income and education were most likely to experience economic ($\rho = .42$), health ($\rho = .72$), interest ($\rho = .18$) and disapproval ($\rho = .21$) constraints. Two results, however, failed to support our hypothesized expectations. First, among all strata, older men with lower incomes and without a college degree were most likely to experience a lack of partner ($\rho = .33$) as an outdoor recreation constraint. Second, younger White men with a college education and earnings above \$20,000 were most likely to report time constraints ($\rho = .51$).

Thus far, results indicate that for most constraints, a greater number of disadvantageous statuses were related to a higher probability of experiencing outdoor recreation constraints. However, no attempts were made to learn if these findings reflect an incremental increase in constraint for each additional status or if effects are “more than the sum of their parts.” In the final stage of analysis, the multiple hierarchy stratification perspective was empirically

TABLE 2 The Probability of Experiencing Selected Constraints to Outdoor Recreation According to Status Characteristics

	Variables							Probability for Constraints						
	Education	Income	Age	Gender	Race	Transport	Economic	Knowledge	Time	Partner	Fear	Health	Interest	Disapprove
Stratum 1	College	Over \$20,000	Under 65	Male	White	0.098	0.091	0.135	0.507	0.185	0.390	0.294	0.132	0.121
Stratum 2	Non-college	Over \$20,000	Over 65	Male	White	0.209	0.326	0.196	0.482	0.140	0.325	0.403	0.129	0.155
Stratum 3	Non-college	Below \$20,000	Under 65	Male	White	0.192	0.270	0.161	0.257	0.225	0.468	0.625	0.157	0.195
Stratum 4	Non-college	Over \$20,000	Over 65	Male	White	0.142	0.146	0.195	0.368	0.325	0.429	0.679	0.165	0.171
Stratum 5	Non-college	Below \$20,000	Over 65	Female	White	0.297	0.328	0.223	0.484	0.180	0.459	0.236	0.124	0.129
Stratum 6	Non-college	Below \$20,000	Over 65	Female	Hispanic	0.475	0.365	0.353	0.393	0.283	0.656	0.295	0.129	0.146
Stratum 7	Non-college	Below \$20,000	Over 65	Female	Black	0.340	0.415	0.301	0.426	0.196	0.649	0.721	0.184	0.209

TABLE 3 Testing for Significant Differences Between Summative and Interaction Models Ability to Predict Recreation Constraints

	Transportation (N = 2338)	Economic (N = 1995)	Knowledge (N = 2005)	Time (N = 2007)	Partner (N = 2332)	Fear (N = 2440)	Health (N = 2005)	Interest (N = 1980)	Do not approve (N = 2007)
Intxn/Sum	1.286	2.091	1.819	-3.38	4.519	4.339	1.58	1.022	1.027
Significance testing	NS	.032	.047	.023	.001	.001	.050	NS	NS
Intxn > Sum									

$$\text{Sum} = \text{Logit}(\pi) = \alpha + \sum (\beta_{\text{INC}}, \beta_{\text{EDUC}}, \beta_{\text{SEX}}, \beta_{\text{AGE}}, \beta_{\text{RACE}})$$

$$\text{Intxn} = \text{Logit}(\pi) = \alpha + \beta_{\text{INC} \times \text{EDUC} \times \text{SEX} \times \text{AGE} \times \text{RACE}}$$

tested. For six of the nine constraint items, the effects of status characteristics were significantly multiplied when statuses were considered together. Thus, our expectations were confirmed for outdoor recreation constraints including economic constraints, knowledge constraints, time constraints, lacking a partner, a fear of crime, and poor health. For example, the probability of perceiving economic constraints was twice as strong when statuses were considered together rather than separately. The probability of being constrained by a fear of crime or not having a partner with whom to participate were more than four times as likely when status variables were allowed to interact with one another. The impact of time constraints also multiplied when multiple statuses interacted. In the case of time constraints, however, multiple advantageous statuses (i.e., higher levels of education, income, youth) led to the increased perception of constraint. This finding was in direct opposition to the stated hypothesis.

Results demonstrated that for many constraints, considering statuses in *combination* rather than in isolation is important. While research provided a general understanding about how status is associated with constraints to leisure, the experience of constraints can be better understood by testing the interaction of multiple statuses. Then, the experience of constraints for any population of interest can be more accurately gauged.

Discussion and Conclusions

Despite an emerging understanding of how status characteristics are associated with recreation constraints, little is known about how statuses, when combined, are related to the perception of recreation constraints. Our study contributes to the study of constraints in three ways:

1. We described and tested *a theoretical perspective*, which may offer a viable new option for the development of constraints theory.
2. Our findings addressed a related concern that constraint research can *connect topical areas*.
3. Findings provided information on the *outdoor recreation constraints* of sub-groups of the population.

We discuss the results according to these three contributions.

The Theoretical Perspective

Perhaps the most compelling outcome of the current study is the support provided for our third hypothesis. For six of the nine constraints under investigation, the effects of status interaction were significantly greater than the additive effects of each status variable. This finding showed that when tested as a theory, a multiple status hierarchy perspective can offer some insight into the lived experience of constraints. While previous findings described the association of status characteristics and leisure constraints, the multiple hierarchy stratification perspective can provide information on the likely intensity or presence of outdoor recreation constraints for specific sub-groups of the population. Further, these findings suggested that because the perception of some constraints multiplies when statuses interact, the experience of constraints is likely to be greater than what researchers have described to date.

In addition to serving as a testable assertion about constraints, findings also imply that a multiple hierarchy stratification perspective may be a useful framework for the study of constraints as well as other constructs. This suggestion represents a noteworthy advance following critiques about the paucity of viable theoretical frameworks to link constraints

to variables such as socio-demographics, race, and gender (Floyd, 1998; Henderson & Ainsworth, 2001; Shinew & Floyd, 2005). Our results indicated that multiple stratification hierarchy perspectives may usefully be applied to a range of dependent variables. In light of significant results demonstrating multiplied effects when statuses were combined, leisure researchers might consider adopting this theoretical perspective for studies of beyond the topic of outdoor recreation. Studies that investigate the lived experience of leisure as expressed in studies of recreation experiences, leisure constraints, constraint negotiation, or experience satisfaction may benefit from the adoption of a multiple hierarchy perspective.

Findings also provide additional evidence regarding which constraints have “strong” or “moderate” relationships with outdoor recreation. Across a series of large data sets, Walker and Virden (2005) identified structural constraints that were significantly related to individual characteristics. Our study also indicated that among these variables considered strong or moderate constraints to outdoor recreation, poor health, a lack of time, lack of knowledge, economic constraints, and a fear of crime were significantly more important when allowed to interact with respondents’ multiple characteristics. Thus, although already recognized as important constraints to outdoor recreation, interaction effects observed in the study results indicated that the impact of these particular constraints may be greater than previously thought.

Connecting Topical Areas

The popularity of constraints research is partially explained by its ability to give meaning to study across diverse content areas (Jackson & Scott, 1999). In a similar vein, we hope that the continued study of constraints according to diffuse status characteristics will resonate across diverse topical areas. The multiple hierarchy perspective can improve an understanding of the leisure habits of the general population (Jackson & Henderson, 1995; Jackson & Scott, 1999) and improve understanding of how the framing of race, gender, and age in society influences the lives of individuals from marginalized groups. Thus, the systematic study of constraints among various minority subpopulations may pay dividends by stimulating dialogue among leisure researchers working in different topical areas. Equally important, this research area has the potential to inform interdisciplinary research on structural and societal issues.

Outdoor Recreation Constraints

With regard to outdoor recreation constraints, study results extend previous findings that described the relationship of status variables to constraints in other recreation settings. Recognizing that interpretation of findings is limited by the criterion variable adopted for study, however, is important. Specifically, our findings discuss the importance of constraints to outdoor recreation on respondents’ decision to leave home for recreation. As research moves forward in the study of outdoor recreation constraints, using different criterion variables to understand participation outcomes and modifications of population subgroups will be important. For example, had our study focused on a specific recreational site or used enjoyment as a criterion variable, the results may have been different.

Research has consistently documented an increase in the importance of constraints for individuals with lower SES across many contexts including community meetings, physically active recreation, and in park usage (Alexandris & Carroll, 1997; Brown et al., 2001; Scott & Munson, 1994). Since our first hypothesis was supported by current data, our findings add to this body of literature. In line with previous studies about the greater importance of constraints among older adults (Milner, Jago, & Deery, 2003; Scott & Jackson, 1996;

Wang et al., 2005), we also observed a general increase in the importance of constraints to outdoor recreation in respondents over 65 years.

The association of female gender and perceived constraints was not as strong as we may have expected given the breadth of literature that describes women's leisure as constrained. Significant findings however, did link gender to fear of crime and being constrained by a lack of partner. These two constraints have been identified more frequently among women than men in previous research (Aitchison, 2003; Henderson & Bialeschki, 1993; Shaw, 1994; Whyte & Shaw, 1994). Unfortunately, these specific constraints are often particularly difficult for women to negotiate. For example, previous research has identified "going with a partner" as a key negotiation strategy for women to take part in park or forest-based recreation when they encounter a fear of crime (Henderson & Bialeschki, 1993; Manning et al., 2001). Particularly for remote outdoor recreation sites, on-site policies allowing women to engage in other identified negotiation strategies such as visiting with a dog and informing women of safety measures taken (e.g., identifying well-lit areas, indicating the frequency of patrols and emergency communication locations) may be important (Bialeschki, 2005).

An association between race/ethnicity and perceived constraints was evident as anticipated by the first hypothesis. The Hispanic variable best explained three recreation constraints indicators and the Black variable was the best predictor of two constraints. Some previous studies linking leisure constraints to race/ethnicity have described conflicting findings. For example Gobster (2002) and Johnson et al. (2001) described the presence of increased constraints among African Americans while Shinew, Floyd, and Parry (2004) observed fewer perceived constraints among minority populations. We identified an increase in constraints among minorities, which was significantly magnified among racial and ethnic minorities with low SES. Older minority women with low SES had the highest probability of experiencing seven of the nine constraints included in our investigation. These results are similar to findings by Arnold and Shinew (1998), who observed park participation discrepancies between low income African Americans and Whites but not between middle income Whites and Blacks. Our results supported the multiple hierarchy stratification perspective that expects multiple disadvantageous statuses to increase disparities.

Finally, we would be remiss if we did not address the relationship of status and time constraints. Time constraints were most important to respondents with the most advantageous status characteristics. This finding was contrary to our hypothesized expectation that respondents with multiple disadvantageous statuses would report *all* constraints at higher levels than respondents with more advantageous status characteristics. That men should perceive the greatest time constraints was puzzling. Since several empirical studies have consistently documented fewer leisure hours for women than men (Daly, 1996; Deem, 1986; Gershuny, 2000; Hochschild & Machung, 1990; Robinson, Putnam, & Godbey, 1999), alternative explanations of these results must be considered. Since an interest in outdoor recreation was observed among all respondents, findings may reflect the greater importance women ascribed to constraints other than time, or women's own acceptance of their time constraints (e.g., they no longer affect decisions to leave the home). That White respondents should perceive the greatest time constraints was also surprising. This finding calls into question Crespo's (2000) assumption about the character of work across social strata. Future studies using this theoretical perspective might employ mixed methods and examine the character of respondents' work to help uncover the meaning of these relationships.

Although the results provide important information for theory development, immediate application of findings will be a challenge for leisure service providers. Findings add to the growing realization of the complexity of constraints operation on leisure behavior and provide additional rationale to understand why alleviating individual constraints is often unsuccessful in encouraging participation. While constraints research has offered numerous

insights for the provision leisure services, ultimately the value of constraints research to providers was aptly captured by Goodale (1992) who asked, "Why do we study constraints, if not because we want to do something about them, and as a result, make people more free?" (p. 3). Unfortunately, current findings provide insight into why leisure service providers' efforts to alleviate recreation constraint may often prove unsuccessful. For example, a recreation provider may choose to waive entrance fees to his or her outdoor recreation site to encourage participation among citizens with financial constraints to participation. Our findings suggest, however, that this effort may not improve participation since individuals with lower incomes are likely to experience additional constraints related to their other status characteristics (e.g., age and gender related constraints).

Constraints researchers have recognized that reduction of individual constraints may not enable participation. The importance given to testing different criterion variables and developing constraint negotiation models attest to this fact. However, our findings indicated that not only do multiple constraints influence outdoor recreation participation and enjoyment, but status characteristics also combine to help determine the quantity and intensity of outdoor recreation constraints. We hope that continued research into smaller sub-groups of the population as recommended by Jackson and Scott (1999) will offer information for systematically recognizing constraints and in helping recreation and park customers negotiate these constraints. To support leisure providers, researchers must also identify valid and reliable proxy variables that represent the outcome of status combinations. Until this information is available, leisure service providers must continue addressing constraints on an ad hoc basis with individual participants who indicate sufficient motivation to seek agency affordances.

As outlined, working to make recreation offerings inclusive for people with a myriad of individual status characteristics is difficult. However, this effort will be increasingly important to increasing the customer base for leisure services. For example, in Texas today, racial and ethnic minorities account for 50.2% of the state's 22 million residents. Demographic trends indicate that people of all ethnic or racial minority groups are increasing at a faster rate than the U.S. population as a whole (Murdock, 2004). Thus, the United States is shifting from a predominantly European American to an increasingly diverse and multicultural society (Riche, 2000). In addition, women already outnumber men nationally, and the front wave of the baby boom generation is preparing for retirement. These trends suggest that individuals in strata six and seven are rapidly increasing. Thus, as the populations in Texas and the United States undergo ethnic transformation and population aging, policy makers should consider how status characteristics limit access to public outdoor recreation opportunities.

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