

Visitor Constraints to Physical Activity in Park and Recreation Areas: Differences by Race and Ethnicity

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EXECUTIVE SUMMARY: Health benefits of physical activity are well recognized and documented, yet inactivity and obesity rates remain high in the U.S., particularly among racially and ethnically diverse populations. A greater understanding of factors that constrain physical activity in parks and recreation areas across various racial and ethnic groups may improve an agency's ability to address obesity and sedentary lifestyles. Previous research has begun to document constraints to physical activity, as well as differences in both general leisure constraints and physical activity by race/ethnicity. However, additional work is needed to specifically examine constraints to physical activity of racially and ethnically diverse park visitors due to their increase in population proportion and risk for health issues. Therefore, this study examined differences in perceived constraints to physical activity in park and recreation areas among four racial and ethnic groups (Asian, Black/African American, non-Hispanic/Latino Whites, and Hispanic/Latinos of all races) while controlling for the effects of age, education, gender and recreation site location. Onsite questionnaires were administered to visitors in four park and recreation areas in the U.S. Two sites, one urban-proximate (city park) and one urban-distant (park/recreation area 50 miles or more from city), were selected in the Los Angeles and Minneapolis metropolitan areas. Results revealed similarities and differences among race and ethnic groups regarding constraints to physical activity in park and recreation areas and indicated a number of implications and opportunities for land managers. Time, family obligations and lack of energy were the greatest constraints for all groups. Therefore, efforts to reduce or at least address these constraints will be particularly important across all visitors. Differences emerged in 14 of the 18 constraint items among Asian, Black, Hispanic/Latino and White respondents when controlling for the effects of each recreation site location, and 10 differences remained when also controlling for age, education, and gender. In general, constraints were greater for racially/ethnically diverse respondents, and particularly for Hispanic/Latino visitors. As these populations have higher rates of obesity and sedentary lifestyles, it is critical that their constraints be addressed. In addition, land managers seeking to increase physical activity on their lands for the improved health benefits of visitors and potential visitors should attend to the constraints experienced by all.

KEYWORDS: physical activity, health, constraints, race/ethnicity

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ACKNOWLEDGMENTS: This study was funded by a grant from the USDA Forest Service – PSW Research Station.

Health benefits of physical activity are well recognized and documented, yet inactivity and obesity rates remain high in the United States. In 2007, 63.0% of U.S. adults were either overweight or obese (Centers for Disease Control and Prevention [CDC], 2008a). Inactivity is a contributing factor to obesity and a serious concern. In 2007, 13.5% of the U.S. population was completely inactive and only 48.8% met the recommended levels of physical activity: at least 30 minutes of moderate intensity physical activity five or more days of the week or 20 minutes of vigorous intensity physical activity three or more days per week (CDC, 2008b).

These trends are particularly alarming among racially and ethnically diverse populations. The CDC's physical activity and obesity statistics for White, Black and Hispanic populations reveal distinct differences among these groups: Whites are more active and less obese. Specifically, in 2007 51.7% of White adults met physical activity recommendations, and 10.8% were inactive (CDC, 2008b). In contrast, only 40% of Blacks or Hispanics met physical activity recommendations, and 20% were inactive (met recommendations: 40.5% Black, 42.1% Hispanic; inactive: 19.7% Black, 21.4% Hispanic). Also, 72.2% of Blacks and 65.3% of Hispanics were identified as overweight or obese compared to 62.3% of the White population (CDC, 2008a). Data for those of Asian descent are not available.

Recreation and park visits can contribute to physical activity and subsequently improve the health of visitors (Bedimo-Rung, Mowen, & Cohen, 2005; Cohen et al., 2007; Godbey, Caldwell, Floyd, & Payne, 2005; Ho, Payne, Orsega-Smith, & Godbey, 2003; Librett, Henderson, Godbey, & Morrow, 2007). Parks and recreation areas provide free or low-cost places for physical activity and are generally accessible to individuals from diverse populations (Vinluan, 2005), although disparities in this accessibility do exist (Taylor, Floyd, Whitt-Glover, & Brooks, 2007). Further, studies indicate that park and trail use is correlated with several health measures including lower body mass index (BMI) and blood pressure (Payne, Orsega-Smith, Godbey, & Roy, 1998), fewer physician visits (Godbey, Roy, Payne, & Orsega-Smith, 1998), and increased frequency of exercise (Gordon, Johnson, & Liparula, 2005). However, opportunity to increase leisure time physical activity (LTPA) in parks and recreation areas exists. Although approximately nine out of 10 U.S. citizens participate in outdoor recreation and 55% visit federal lands (RoperASW, 2004), nearly 25% of U.S. adults report no LTPA (CDC, 2008b). Similar to activity level, LTPA is higher for Whites as opposed to racially and ethnically diverse populations. For example, 30.9% of Blacks and 35.7% of Hispanics report no LTPA compared to 23.6% of Whites (CDC, 2008b).

In June 2002, President Bush issued Executive Order 13266 to improve the health of all U.S. citizens, with physical activity identified as one of the four health-protection pillars. In an effort to promote use of the nation's public lands and water resources to enhance the health and well-being of U.S. citizens, a Federal Interagency Memorandum of Understanding and

Work Group representing the Departments of Health and Human Services, Agriculture, Interior, and the U.S. Army Corps of Engineers was created. As the U.S. becomes more racially and ethnically diverse (U.S. Census Bureau, 2008), it is important to understand these sub-populations and their health. A greater understanding of factors that constrain physical activity in parks and recreation areas across various racial and ethnic groups may improve an agency's ability to address obesity and sedentary lifestyles. This study seeks to improve that understanding through an examination of differences in perceived constraints to physical activity in park and recreation areas among racial and ethnic group visitors.

Background

Although park and recreation visits can contribute to physical activity, constraints to recreation and physical activity in parks and recreation areas exist. Constraints are defined by Jackson (2000) as "factors that are assumed by researchers and/or perceived or experienced by individuals to limit the formation of leisure preferences and/or to inhibit or prohibit participation and enjoyment in leisure" (p. 62). Investigations of constraints inform managers and researchers about factors that influence recreation participation (Jackson, 2000), and by extension, physical activity in parks and recreation areas.

Most leisure constraints research is focused on leisure participation generally. However, several studies specific to constraints of physically active leisure suggest a number of factors that may also influence physically active park visits, including time, transportation, safety, cost, lack of skills, feeling like a minority, fatigue, and family obligations (Alexandris, Barkoukis, Tsohatzoudis, & Grouios, 2003; Henderson & Ainsworth, 2000; Henderson et al., 2001; Miller & Brown, 2005; Son, Mowen, & Kerstetter, 2008). Similarly, public health research identifies a variety of personal, social, and environmental factors influencing physical activity, termed "barriers" in this line of research: lack of time, fatigue, lack of energy, bad weather, lack of partners, self-consciousness, safety concerns, lack of motivation, other priorities or commitments, and not liking to be physically active (Brown, Huber, & Bergman, 2006; Brownson, Baker, Housemann, Brennan, & Bacak, 2001; Genkinger, Jehn, Sapun, Mabry, & Rohm Young, 2006; Salmon, Owen, Crawford, Bauman, & Sallis, 2003; Trost, Owen, Bauman, Sallis, & Brown, 2002). Furthermore, additional research shows that factors such as access, social support, self-efficacy, as well as the number and type of amenities such as paths and courts may influence physical activity in parks (Floyd, Spengler, Maddock, Gobster, & Suau, 2008a, 2008b; Kaczynski & Henderson, 2007; Kaczynski, Potwarka, & Saelens, 2008; Mowen, Orsega-Smith, Payne, Ainsworth, & Godbey, 2007; Orsega-Smith, Payne, Mowen, Ho, & Godbey, 2007; Shores & West, 2008). However, investigations of constraints to physical activity specifically for park visitors are limited. Previous research that has examined constraints to physical activity in parks used samples that include park agency volunteers (Son, Mowen et al., 2008) or considered park and recreation as one aspect of community services (Henderson et al., 2001), and therefore, investigations of constraints that focus specifically on visitors to park and recreation areas are warranted.

The majority of research indicates that constraints to recreation in general are perceived differently by race/ethnicity (Covelli, Burns, & Graefe, 2007; Gitelson, Bernat, & Aleman, 2002; Johnson, Bowker, & Cordell, 2001; Shinew, Floyd, & Parry, 2004; Shores, Scott, & Floyd, 2007; Tierney, Dahl, & Chavez, 1998). For example, Covelli et al. (2007) examined traditional (Caucasian) and non-traditional (not Caucasian) users of a national forest and found that non-traditional respondents were more constrained than traditional respondents on a number of items such as transportation, available recreation opportunities, and cultural reasons. Similarly, Shores et al. (2007) found that both Black and Hispanic respondents were more likely than White respondents to report constraints pertaining to transportation,

economic, fear of crime, poor health, disapproval of others, and knowledge. In contrast, Shinew et al. (2004) examined differences in leisure constraints between African-American and Caucasian respondents which revealed that while differences in constraints existed, Caucasians were consistently more constrained than African-Americans on each item that was significantly different, such as lack of transportation and fear of racial conflict. Like the majority of outdoor recreation research, public health research also identifies constraints and barriers to active living in racially and ethnically diverse populations (Belza et al., 2004; Eyler et al., 2002; Genkinger et al., 2006; Henderson & Ainsworth, 2003; Keller & Fleury, 2006; King et al., 2000; Marquez, McAuley, & Overman, 2004). However, this previous research has examined differences by race/ethnicity either in constraints to active living in general rather than park visitors in particular or in constraints to park visitors' recreation rather than physical activity. Therefore, a need exists to study constraints to physical activity of racially and ethnically diverse park visitors.

Beyond investigations of constraints and physical activity by race and ethnicity, research has demonstrated additional demographic variables as important correlates to this activity. Specifically, age, gender and education have also been correlated with both leisure constraints (Johnson et al., 2001; Shores et al., 2007; Son, Kerstetter, & Mowen, 2008) and physical activity (Eyler et al., 2002; He & Backer, 2005; Marshall et al., 2007). In summary, previous research has begun to document constraints and barriers to physical activity, as well as differences in both general leisure constraints and physical activity by race/ethnicity. However, additional work is needed to specifically examine constraints to physical activity of racially and ethnically diverse park visitors. Therefore, this study examined differences in perceived constraints to physical activity in park and recreation areas among four racial and ethnic groups (Asian, Black/African American, non-Hispanic/Latino Whites, and Hispanic/Latinos of all races) while controlling for the effects of age, education, and gender. In addition, the data for this study were collected across multiple park and recreation sites and therefore the analyses also control for recreation site location.

Methods

Onsite questionnaires were administered to visitors in four park and recreation areas to ascertain differences in constraints to physical activity at these locations across race and ethnicity.

Study Sites

Four park sites across two states served as study sites for this analysis. Two sites, one urban-proximate (city park) and one urban-distant (park/recreation area 50 miles or more from city), were selected in the Los Angeles and Minneapolis metropolitan areas (see Table 1). At each metropolitan area, the sites were selected because they were comparable in terms of the amenities offered and urban density (Vogel, 2005). Further, as the goal of this study was to examine differences among ethnic and racial groups, urban proximate sites were located in racially and ethnically mixed neighborhoods.

Sampling

Bilingual (Spanish and English) interviewers contacted site visitors April through October of 2006. Sampling was systematically proportioned across the month, day of week, and time of day based on available visitation records and prior site observation. All available visitors 18 years of age or older were contacted at trail heads, parking lots, and activity areas based on prior observation at each site during data-collection times. Unavailable visitors were those engaged in activities where speed or organized sport precluded contact, such as biking very fast or soccer games. Field personnel tracked

Table 1. Park Locations, Type and Response Rates.

Metropolitan Area	Urban Proximate		Urban Distant	
	Site	Response rate	Site	Response rate
Los Angeles, CA	Hawkins Park	71.2% (n=210)	San Gabriel Canyon	54.8% (n=253)
	Powderhorn Park	78.3% (n=470)	Wild River State Park	87.3% (n=363)
Overall response rate		73.10% (n=1296)		

response rates and logged information about “unapproachable” visitors (e. g., number in group, reason could not approach, activity, etc.).The response rates for those approached ranged between 54.8% and 87.3% across the four sites (see Table 1).

Instrument

A three-page instrument was pre-tested, translated to Spanish and back translated to English. The instrument assessed constraints to physical activity as well as visitor and visit characteristics including site use, physical activity, and demographics.

Constraints to physical activity at the site were assessed with 18 items (see Table 4) based on previous research (e.g., Arnold & Shinew, 1998; Hubbard & Mannell, 2001; Shinew et al., 2004; Wilcox, Castro, King, Housemann, & Brownson, 2000), such as not enough time, no one to go with, and fear of physical assault. These items were selected based on frequently identified and used leisure constraints and barriers to physical activity found in both the recreation and public health literature. Respondents were asked, “How much do you agree or disagree that the following keep you from coming to this area more often for physical activity?” and indicated the extent to which they experienced the constraints to physical activity at the sites on a 5-point scale, where 1 equaled not at all and 5 equaled a great deal.

Respondents were also queried regarding their personal characteristics. Overall physical activity participation was measured in terms of days per week and amount of time per day spent in moderate and/or vigorous activity (with a minimum of 10 minutes). These questions were modeled after select physical activity questions from the Behavioral Risk Factor Surveillance System (CDC, 2005) and International Physical Activity Questionnaire (IPAQ, 2002). Moderate activity was defined as that which causes small increases in breathing or heart rate, while vigorous activity was defined as that which causes large increases in breathing or heart rate. Respondents also reported the main activity engaged in during the visit, if they come to the area for physical activity, and where they usually do their physical activity from a list of possible options. Finally, respondents were asked several demographic questions, including race, ethnicity, gender, age, education, height and weight.

Data Analysis

Questionnaire data were entered and analyzed using SPSS 15. Descriptive analyses provided means, standard deviations, and frequencies to describe the sample and variables of interest. Physical activity duration items were winsorized (top 1%) to address outliers.

Respondents were categorized as meeting physical activity recommendations following CDC guidelines and data-reporting procedures. As with the CDC data, a combination of moderate and vigorous physical activity to meet the requirement for engaging in regular physical activity was not assessed and, therefore, the prevalence of meeting recommendations may be underestimated (CDC, 2007). BMI was calculated by the height and weight information respondents reported. For comparison purposes, an adult person with a BMI between 18.5-24.9 is of normal weight, while 25-30 is considered to be overweight, and a person with a BMI more than 30 is considered to be obese (CDC, 2006).

The U.S. government considers race and Hispanic/Latino origin to be two distinct concepts (U.S. Census Bureau, 2001). Specifically, a person of Hispanic/Latino origin may be of any race. In this study, respondents' race and ethnicity were combined into one variable for comparison purposes. Therefore, the two variables were combined by creating a variable that contained Hispanic/Latinos of any race, and then each of the other race categories for those individuals that are non-Hispanic/Latino. For simplicity, in the remainder of the paper, Hispanic/Latino of any race will be referred to as simply Hispanic/Latino and non-Hispanic/Latino will be dropped from the other race categories (for example, White non-Hispanic/Latino will be referred to as White). The remaining analyses were conducted using the most frequently reported race categories: Asian, Black, Hispanic/Latino and White.

Analysis of variance (ANOVA) with Tukey's HSD post hoc tests and Pearson Chi-Square tests compared the site visitors by respondents' race/ethnicity on demographic characteristics. Analysis of covariance (ANCOVA) was employed to compare constraints to physical activity at each site and control for the effect of each recreation site location as data were collected across multiple sites. To reduce the family-wise error of the separate ANCOVAs, Bonferroni's multiple comparison adjustment of the alpha level was employed (Bray & Maxwell, 1982). Each of the Bonferroni-corrected significant ANCOVAs was followed by a Sidak post hoc test to determine where the statistically significant differences were found (Field, 2005). A second ANCOVA compared constraints to physical activity by respondents' race/ethnicity while controlling for the effects of age, gender, and education in addition to the study site location. Once again, the Bonferroni adjustment and Sidak post hoc tests were employed.

Results

Respondents were more often female, in their 20s to 40s, had high school/GED or college educations, and were overweight or obese when combined (see Table 2). Slightly more than half of respondents were female (53.3%). Respondents ranged in age from 18 to 78 years with 57.9% between 21 and 40 years and a mean age of 38.1. Most frequently respondents had received a high school/GED or college degree (25.4% and 25.1% respectively) as their highest level of education. Although most respondents reported meeting physical activity recommendations (61.8%), more than half of respondents were overweight or obese (51.4%) with an average BMI of 25.8.

Most of the respondents were White (50.7%) and then Hispanic/Latino (38.0%), followed distantly by Black (5.1%) and Asian (3.1%; see Table 2). With the exception of gender, demographics differed significantly by respondents' race/ethnicity (see Table 3). Specifically, White respondents were slightly older than the other three groups ($F = 33.8$; $p < .001$). Further, White and Asian respondents reported a greater rate of achieving higher level educational degrees than Black and Hispanic/Latino respondents ($\chi^2 = 603.2$; $p < .001$). Rates of meeting physical activity recommendations also differed among the groups ($\chi^2 = 14.61$; $p < .05$) with Black respondents reporting the highest proportion of meeting recommendations (72.3%) and Hispanic/Latino respondents reported the lowest

Table 2. Respondents' Demographic Characteristics.

Demographic Characteristics	Visitors	
	n	%
<i>Race and Ethnicity</i>		
American Indian or Alaska Native	9	0.7
Asian	40	3.1
Black or African American	65	5.1
Native Hawaiian or Other Pacific Islander	2	0.2
White	650	50.7
Other	6	0.5
Multiple race	23	1.8
Hispanic/Latino, any race	488	38.0
Total	1283	100
<i>Age (M=38.1; SD= 12.5)</i>		
18-20	39	3.1
21-30	400	31.3
31-40	340	26.6
41-50	261	20.4
51-60	170	13.3
61-70	53	4.1
>70	15	1.2
Total	1278	100
<i>Gender</i>		
Female	687	53.3
Male	603	46.7
Total	1278	100
<i>Education</i>		
Eighth grade or less	169	13.2
High school/GED	325	25.4
Tech school	110	8.6
Some college	192	15.0
College degree	321	25.1
Advanced degree	163	12.7
Total	1280	100
<i>BMI (M=25.8; SD= 4.8)</i>		
Underweight (BMI < 18.5)	17	1.4
Normal weight (BMI 18.5-24.9)	564	47.2
Overweight (BMI 25-30)	420	35.1
Obese (BMI > 30)	195	16.3
Total	1196	100
<i>Physical Activity Recommendations</i>		
Inactive	15	1.4
Insufficient activity	406	36.8
Meeting recommendations	682	61.8
Total	1103	100

Note: Totals may not add up to overall response number due to missing values for select variables.

Table 3. Respondents' Demographic Characteristics Reported by Race/Ethnicity.

Demographic Characteristics	Asian (n=40)		Black (n=65)		Hispanic/ Latino (n=488)		White (n=650)		Test statistic
	n	%	n	%	n	%	n	%	
<i>Age</i>	(M=32.8) ^a		(M=35.8) ^a		(M=34.5) ^a		(M=41.4) ^b		F=33.8***
18-20	1	2.5	3	4.7	13	20	21	4.4	
21-30	22	55.0	26	40.6	156	24.1	181	37.9	
31-40	9	22.5	16	25.0	154	23.8	147	30.8	
41-50	5	12.5	8	12.5	153	23.6	84	17.6	
51-60	3	7.5	8	12.5	120	18.5	35	7.3	
61-70	0	0	2	3.1	40	6.2	7	1.5	
>70	0	0	1	1.6	12	1.9	2	0.4	
Total	40	100	64	100	648	100	477	100	$\chi^2=94.8***$
<i>Gender</i>									
Female	19	47.5	35	53.8	260	53.6	349	53.7	
Male	21	52.5	30	46.2	225	46.4	301	46.3	
Total	40	100	65	100	485	100	650	100	$\chi^2=0.6$
<i>Education</i>									
8th grade or less	0	0.0	4	6.2	158	32.7	4	0.7	
High school/GED	1	2.5	22	33.8	209	43.3	83	12.8	
Tech school	4	10.0	8	12.3	46	9.5	50	7.7	
Some college	14	35.0	16	24.6	43	8.9	108	16.7	
College degree	15	37.5	12	18.5	19	3.9	264	40.9	
Advanced degree	6	15.0	3	4.6	8	1.7	137	21.2	
Total	40	100	65	100	483	100	646	100	$\chi^2=603.2**$
<i>BMI</i>	(M=22.6) ^a		(M=26.4) ^{b,c}		(M=26.6) ^c		(M=25.4) ^b		F=12.9***
Underweight (BMI<18.5)	2	5.0	2	3.2	3	0.7	9	1.5	
Normal weight (BMI 18.5-24.9)	29	72.5	22	35.5	174	40.8	320	51.6	
Overweight (BMI 25-30)	6	15.0	23	37.1	167	39.1	204	32.9	
Obese (BMI > 30)	3	7.5	15	24.2	83	19.4	87	14.0	
Total	40	100	62	100	427	100	620	100	$\chi^2=36.5***$
<i>Physical Activity Recommendations</i>									
Inactive	0	0.0	0	0.0	9	2.5	5	0.8	
Insufficient activity	11	36.7	13	27.7	149	42.1	217	34.8	
Meeting recommendations	19	63.3	34	72.3	196	55.4	402	64.4	
Total	40	100	47	100	354	100	624	100	$\chi^2=14.61*$

* $p<.05$; ** $p<.01$; *** $p<.001$; ^{a,b} Any two means that do not share a superscript are significantly different across race/ethnicity groups at $p<.05$ using Tukey's HSD. Note: Totals may not add up to overall response number due to missing values for select variables.

proportion (55.4%). In addition, rates of overweight and obesity differed significantly among the race/ethnicity groups ($\chi^2 = 36.47$; $p < .001$), as only 22.5% of Asian respondents were categorized as overweight/obese compared to 46.9% of the White respondents, 58.5% of the Hispanic/Latino respondents, and 61.3% of the Black respondents.

Most frequently, visitors across all race/ethnicity groups engaged in walking/hiking, relaxing and playing with kids during their visit. However, White respondents reported biking as the second most frequently engaged in main activity and the other three groups each reported picnicking as the third most common main activity. The majority of all respondents reported coming to the area to do something physically active (78.4%), and 37.2% of visitors indicated the site where they were contacted as the usual location of their physical activity, followed by their home (34.9%), a different park/recreation area (27.9%), and fitness center (19.1%).

Constraints to Physical Activity

In general, respondents reported low levels of constraints to physical activity at the sites. The constraint 'not enough time' was the most constraining across all groups followed by family obligations and not enough energy (see Table 4). Depending on control variables, respondents significantly differed on 10 to 14 of the 18 constraints assessed.

Differences by race/ethnicity emerged in 14 of the 18 constraints to physical activity at the sites when controlling for the effect of site location (see Table 4). Hispanic respondents were generally the most constrained and White respondents were the least constrained, as determined by the extent of their agreement with each of the constraint items. Specifically, Hispanic/Latino respondents were more constrained than the White respondents on six items: fear of physical assault, gangs coming here, fear of theft, location is not close enough to my home, not enough money, and this area does not have enough trees and grass. Similarly, Blacks and Hispanic/Latinos were more constrained than White respondents on five items: not enough energy, not enough lighting, fear of racial conflict, feeling unwelcome, and the bus and train don't come here. Likewise, Hispanic/Latino respondents were more constrained by too many people here than the other three groups, and both Asian and Hispanic/Latino respondents were more constrained than White respondents by fear of sexual assault. Finally, Black and Hispanic/Latino respondents were more constrained than White respondents as well as Black respondents more constrained than Asian respondents by area does not offer activities I want.

When controlling for the effects of age, gender and education in addition to site location, differences in 10 of the 18 items remained (see Table 5). Differences in fear of gangs coming here, fear of theft, not enough money and this area does not have enough trees and grass were no longer present. This time, Hispanic/Latino respondents reported being more constrained than White respondents on two items: fear of physical assault and not enough lighting. Similarly, Black and Hispanic/Latino respondents were more constrained than White respondents on four items: not enough energy, fear of racial conflict, location is not close enough to home, and feeling unwelcome. Likewise, Asian and Hispanic/Latino respondents reported fear of sexual assault as more constraining than White respondents while Black and Hispanic/Latino reported this area does not offer activities I want as more constraining than both Asian and White respondents. In addition, regarding the bus and train don't come here, Black and Hispanic/Latino respondents were more constrained than White respondents and Hispanic/Latino respondents were more constrained than Asian respondents. Finally, Hispanic respondents were more constrained by there are too many people here than the other three groups.

In sum, differences in constraints to physical activity at the site by race/ethnicity were found in almost two-thirds of the items assessed, depending on control variables. While

respondents generally reported low levels of constraints to physical activity at the sites, those constraints did differ with Hispanics/Latinos consistently constrained on more items than other groups.

Table 4. Constraints to Park-based Physical Activity by Race/Ethnicity¹.

Constraints ²	Asian (n=40)		Black (n=65)		Hispanic/ Latino (n=488)		White (n=650)		Fvalue
	M	SD	M	SD	M	SD	M	SD	
Not enough time	2.98	1.33	2.95	1.40	3.21	1.28	3.22	1.30	2.25
Family obligations	2.90	1.53	2.78	1.47	3.09	1.32	2.74	1.24	1.11
Not enough energy	2.69 ^{a,b}	1.31	2.80 ^a	1.31	2.74 ^a	1.21	2.22	1.09	11.00***
Fear of physical assault	2.40 ^{a,b}	1.36	2.32 ^{a,b}	1.13	2.40 ^a	1.10	2.14 ^b	1.12	8.34***
Not enough lighting	2.22 ^{a,b}	1.08	2.37 ^a	0.98	2.52 ^a	0.98	1.99 ^b	0.94	18.41***
Gangs coming here	2.49 ^{a,b}	1.43	2.41 ^{a,b}	1.27	2.45 ^a	1.16	2.16 ^b	1.21	3.84*
Fear of theft	2.38 ^{a,b}	1.33	2.34 ^{a,b}	1.16	2.36 ^a	1.08	2.13 ^b	1.05	4.50*
Fear of sexual assault	2.40 ^a	1.37	2.29 ^{a,b}	1.04	2.36 ^a	1.08	2.01 ^b	1.08	12.37***
People drinking alcohol	2.45	1.36	2.42	1.25	2.22	1.01	2.15	1.09	3.02
Fear of racial conflict	2.28 ^{a,b}	1.30	2.34 ^a	1.09	2.32 ^a	1.03	1.86 ^b	0.92	18.22***
This area does not offer activities I want	1.93 ^{a,b}	0.94	2.38 ^b	1.08	2.32 ^{b,c}	1.13	1.83 ^a	0.91	11.18***
Having no one to go with	2.00	1.06	2.25	1.20	2.27	1.12	2.19	1.13	0.84
Feeling unwelcome	2.10 ^{a,b}	1.06	2.22 ^a	1.00	2.17 ^a	0.97	1.73 ^b	0.82	19.60***
Location is not close enough to my home	2.23 ^{a,b}	1.12	1.95 ^{a,b}	1.08	2.39 ^a	1.20	1.94 ^b	1.05	6.37***
There are too many people here	1.73 ^a	0.78	1.73 ^a	0.79	2.24 ^b	1.05	1.92 ^a	0.89	9.21***
Not enough money	2.08 ^{a,b}	1.00	2.17 ^{a,b}	1.18	2.23 ^a	1.00	1.83 ^b	0.97	3.91*
The bus and train don't come here	1.74 ^{a,b}	0.77	1.95 ^a	1.04	2.07 ^a	0.98	1.56 ^b	0.72	12.56***
This area does not have enough trees and grass	1.78 ^{a,b}	0.86	1.68 ^{a,b}	0.78	1.97 ^a	0.94	1.60 ^b	0.82	5.25**

¹Controlling for the influence of site differences

²Responses were based on 5-point scale with 1=strongly disagree and 5=strongly agree

* $p < .006$; ** $p < .003$; *** $p < .001$; Note: Bonferroni adjusted significance level to control for family-wise error; ^{a,b} Any two means that do not share a superscript are significantly different across race/ethnicity groups at $p < .05$ using the Sidak post hoc test.

Discussion and Management Implications

Understanding and attending to factors that constrain physical activity in parks and recreation areas across various racial and ethnic groups can improve an agency's ability to address obesity and sedentary lifestyles as well as enhance visitors' experiences. Onsite questionnaires revealed similarities and differences among race and ethnic groups regarding constraints to physical activity in park and recreation areas. Patterns that emerged in constraint perception when controlling for age, education, and gender in

Table 5. Constraints to Park-based Physical Activity by Race/Ethnicity Controlling for Age, Education, and Gender¹.

Constraints ²	Asian (n=40)		Black (n=65)		Hispanic/ Latino (n=488)		White (n=650)		Fvalue
	M	SD	M	SD	M	SD	M	SD	
Not enough time	2.98	1.33	2.95	1.40	3.21	1.28	3.22	1.30	2.44
Family obligations	2.90	1.53	2.78	1.47	3.09	1.32	2.74	1.24	0.48
Not enough energy	2.69 ^{a,b}	1.31	2.80 ^a	1.31	2.74 ^a	1.21	2.22 ^b	1.09	6.16***
Fear of physical assault	2.40 ^{a,b}	1.36	2.32 ^{a,b}	1.13	2.40 ^a	1.10	2.14 ^b	1.12	7.69***
Not enough lighting	2.22 ^{a,b}	1.08	2.37 ^{a,b}	0.98	2.52 ^a	0.98	1.99 ^b	0.94	7.68***
Gangs coming here	2.49	1.43	2.41	1.27	2.45	1.16	2.16	1.21	3.27
Fear of theft	2.38	1.33	2.34	1.16	2.36	1.08	2.13	1.05	3.42
Fear of sexual assault	2.40 ^a	1.37	2.29 ^{a,b}	1.04	2.36 ^a	1.08	2.01 ^b	1.08	10.26***
People drinking alcohol	2.45	1.36	2.42	1.25	2.22	1.01	2.15	1.09	2.51
Fear of racial conflict	2.28 ^{a,b}	1.30	2.34 ^a	1.09	2.32 ^a	1.03	1.86 ^b	0.92	11.97***
This area does not offer activities I want	1.93 ^a	0.94	2.38 ^b	1.08	2.32 ^b	1.13	1.83 ^a	0.91	6.92***
Having no one to go with	2.00	1.06	2.25	1.20	2.27	1.12	2.19	1.13	0.43
Feeling unwelcome	2.10 ^{a,b}	1.06	2.22 ^a	1.00	2.17 ^a	0.97	1.73 ^b	0.82	12.11***
Location is not close enough to my home	2.23 ^{a,b}	1.12	1.95 ^{a,b}	1.08	2.39 ^a	1.20	1.94 ^b	1.05	3.95*
There are too many people here	1.73 ^a	0.78	1.73 ^a	0.79	2.24 ^b	1.05	1.92 ^{a,b}	0.89	7.18***
Not enough money	2.08	1.00	2.17	1.18	2.23	1.00	1.83	0.97	0.48
The bus and train don't come here	1.74 ^{a,b}	0.77	1.95 ^{a,c}	1.04	2.07 ^c	0.98	1.56 ^b	0.72	9.36***
This area does not have enough trees and grass	1.78	0.86	1.68	0.78	1.97	0.94	1.60	0.82	3.60

¹Controlling for the influence of site differences

²Responses were based on 5-point scale with 1=strongly disagree and 5=strongly agree
 * $p < .006$; ** $p < .003$; *** $p < .001$; Note: Bonferroni adjusted significance level to control for family-wise error; ^{a,b} Any two means that do not share a superscript are significantly different across race/ethnicity groups at $p < .05$ using the Sidak post hoc test.

addition to recreation site location suggest a number of implications and opportunities for land managers.

In general, the average study respondent had a healthier weight and more often met the CDC's recommended level of physical activity than the average U.S. adult. Specifically, more than 60% of the park and recreation area visitors met physical activity recommendations compared to the less than 50% of citizens nationally (CDC, 2008b). Likewise, while 63.0% of U.S. adults are overweight or obese (CDC, 2008a), fewer study respondents (51.4%) fell into this category. These same patterns emerged for each of the race and ethnic groups examined in the study, aside from Asian respondents, on which the CDC does not report. As respondents were contacted onsite and were visitors, a likely explanation for these differences could be that park and recreation areas visitors may engage in healthy lifestyles, including park visits, more often than the average U.S. adult.

However, nearly 40% of study respondents did not meet physical activity recommendations and more than 50% were obese or overweight. Therefore, opportunities remain for park and recreation area managers to encourage more physical activity among current visitors. Information on visitor constraints to physical activity may guide these efforts. Certainly additional information on non-visitors is also of interest to maximize park and recreation's contribution to community health as a whole.

Consistent with previous research (e.g., Henderson & Ainsworth, 2003; King et al., 2000), findings revealed some constraint similarities for all groups: time, family obligations, and lack of energy. Therefore, efforts to reduce or at least address these constraints may be particularly important. For example, increasing the number of active family program offerings may reduce visitor perceptions that visits take away from family time, while motivational signs and messages may help visitors overcome low energy. Certainly, well-placed messages that indicate the joint benefits realized by spending active family time together could simultaneously target all three constraints. While some of these constraints are out of managerial control, influencing the perception of these constraints is something managers and agencies can attempt.

Differences in the constraints experienced across groups suggest additional management implications. Specifically, differences emerged in 14 of the 18 constraint items among Asian, Black, Hispanic/Latino and White respondents when controlling for recreation site location and 10 differences remained after also controlling for age, education, and gender. Similar to the findings of Shores et al. (2007) and Covelli et al. (2007), constraints were generally greater for racially/ethnically diverse respondents and particularly for Hispanic/Latino visitors. As these populations are growing at a very high rate and have higher rates of obesity and sedentary lifestyles, it is critical that their constraints be addressed.

Many constraints to physical activity at recreation areas identified by these groups are, in fact, manageable as they relate to site characteristics or perceptions. In terms of site perceptions, constraints related to a number of fears existed. Attention toward safety concerns is essential, given that people are least active when concerned about safety (Kirtland et al., 2003). Possible ways to address these safety concerns include providing safety tips and encouraging community monitoring of problem areas. Also, statistical information on the actual number and type of assaults may deter false impressions related to safety issues and increase site use for physical activity. In terms of fears related to racial conflict and feeling unwelcome, efforts such as staff training, hiring diverse staff so that people see others like themselves, and providing information in multiple languages may work to reduce those constraints (e.g., Allison, 2000; Chavez, 1993; Floyd & Nichols, 2008). An audit of how the staff reflects the local population demographically may reveal hiring and volunteer opportunities.

Related to onsite offerings, diverse respondents were more constrained by not having activities they want available at the park. Therefore, assessing how current offerings differ from desired offerings may provide some insight. Managers could inventory their physical activity offerings and compare that to desired activities of local groups to ensure they are providing opportunities for a variety of visitors. Certainly such activity offerings must lie within the mission and mandate of the area, but there may be simple solutions that can simultaneously meet visitor experience preferences and enhance their health. Managers are encouraged to follow CDC (2004) recommendations to increase physical activity with efforts to market and program LTPA on their lands throughout the community. Similarly, other research to assess crowding preferences among varied racial and ethnic groups appears necessary to inform landscape level planning and design for a diversifying public.

For example, perhaps Hispanic/Latino respondents' perceptions of too many people have something to do with the area of the park they use and the activities they are involved in.

Racially and ethnically diverse respondents were also more constrained by access to the park in terms of distance from their home and lack of public transportation. Therefore, as suggested by Godbey et al. (2005), managers could consider partnerships with public transportation to help increase access for these visitors. For example, local public transportation organizations could help detail options for getting to the park, such as combining bus and safe bike routes. Likewise, managers could work with local transportation to create carpool networks that assist visitors in coordination efforts.

Additional qualitative research could identify specific problems and occurrences, provide further insight into the differences across racial and ethnic groups, and generate alternative solutions. In addition, evaluations should be implemented to assess the effectiveness of any efforts to address constraints. Further, the unique context of each park and recreation area should not be overlooked when considering these management implications and applying the findings of this study. However, the differences that emerged among the racial and ethnic groups when controlling for variations by recreation site do indicate some stability in the findings across park sites. Therefore, even if some sites do not have problems with gangs, for example, managers are encouraged to still consider the possibility that certain groups in the population may be constrained by perceptions and fears of them.

As suggested by previous work (e.g., Eyler et al., 2002; He & Backer, 2005; Shores et al., 2007; Son, Kerstetter et al., 2008), study findings reveal the importance of controlling for age, education, and gender when comparing constraints to physical activity in park and recreation areas across racial and ethnic groups. The differences when controlling for these variables indicate that they do influence perceptions of constraints to physical activity in park and recreation areas and subsequently should not be ignored when attempting to understand constraints. However, as overall results were largely the same as before controlling for these factors, race and ethnicity did still emerge as a significant distinguishing factor.

A limitation of this study was that study participants were contacted on-site. Subsequently, additional research should be done with a broader sample including non-park visitors as well as additional sites. Johnson et al. (2001) examined differences in outdoor recreation constraints by race, gender and rural dwelling for participants and non-participants. The authors found no differences for participants by race, but differences in both safety concerns and lack of companions for nonparticipants. Therefore, although knowledge of constraints experienced by visitors is useful and indeed important information for managers, similar information on non-visitors may provide more as well as different information. Furthermore, qualitative research of non-visitors' constraints to park based physical activity that focus on racially and ethnically diverse populations may further validate current measures as well as suggest additional constraints that may have been previously been overlooked.

In addition, future research could seek larger samples of Asian and Black/African American populations as the power to detect differences among these groups was limited due to their smaller sample sizes. Further, future investigations could also consider the diversity within each population. Specifically, previous research on constraints to outdoor recreation among Asian Americans (Winter, Woo, & Godbey, 2004) and correlates of physical activity among Latinos (Marquez et al., 2004) illuminate the heterogeneity of each cultural groups and support explorations of similarities and differences among their subcultures.

This study used self-report measures of physical activity, which depend on the respondents' ability to correctly recall and report activity levels (Kriska & Caspersen, 1997; Sallis & Saelens, 2000). Despite the limitations of physical activity self-report measures, it is one of the more common measures due to its acceptability, cost, practicality, and low interference with behavior (Dale, Welk, & Matthews, 2002; Kriska & Caspersen, 1997; Motl, McAuley, & DiStefano, 2005). This study collected physical activity data for comparison to the CDC's U.S. population data, which are also collected by self-report techniques through the BRFSS instrument, and has been documented as both valid and reliable (Yore et al., 2007).

Conclusions

The results of this study show that constraints to physical activity on public lands do differ among racially and ethnically diverse groups, even when controlling for the effects of age, education, and gender in addition to recreation site location. Therefore, land managers driven to increase physical activity on their lands for the improved health benefits of visitors and potential visitors should attend to the constraints experienced by all types of users.

Based on the constraints identified in this study as well as legislative mandates to improve physical health and provide for community residents, partnership opportunities abound for park and recreation personnel. First and foremost, reaching out to local health officials and offices is essential. Such communication can open the doors for future opportunities in resource collaboration and programming, as well as significantly benefit the public. Second, given the consistent transportation constraints, discussions with public transportation and local or regional planning officials is important to improve access to the public areas. Third, a number of public and non-profit organizations exist to help non-majority populations: ensuring park and recreation officials and areas are known to these organizations again expands the recreation reach and targets a growing population.

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