

Physical Activity and the Recreation Opportunity Spectrum: Differences in Important Site Attributes and Perceived Constraints

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EXECUTIVE SUMMARY: Both legislation and professional organizations call for parks and recreation agencies to address the need for greater physical activity among those living in the United States. A greater understanding of factors that facilitate and constrain physical activity in parks and recreation areas may improve agencies' ability to address obesity and sedentary lifestyles. This paper examines potential differences in factors that influence physical activity between visitors to two parts of the recreation opportunity spectrum: urban and semi-primitive non-motorized (SPNM) sites in the United States. Specifically, visitors to urban and SPNM sites were compared in terms of their perceptions of site attributes important for physical activity as well as constraints to physical activity. Onsite questionnaires were administered to visitors across six sites in three states. Two sites, one urban and one SPNM, were selected in and around each of the following metropolitan areas: Los Angeles, CA; Chicago, IL; and Minneapolis, MN. Findings revealed both similarities and differences between urban and SPNM visitors on visitor and visit characteristics, site attributes important for physical activity and constraints to physical activity. The results from this comparison point to opportunities for recreation managers and planners across the recreation opportunity spectrum. First, the promotion of management approaches for physical activity can vary across the recreation opportunity spectrum for maximum effectiveness. Second, the identified site attributes important for and constraints to physical activity suggest opportunities for physical activity site design, visitor programs, and inter-agency coordination. Finally, as the majority of visitors reported visiting the area to do something physically active, recreation professionals at both opportunity areas are encouraged to coordinate or continue coordinated efforts with public health resources. Given the number of citizens that are overweight and obese, combining the resources and efforts of both

recreation and public health professionals can increase efficiency and is essential across the recreation opportunity spectrum.

KEYWORDS: health, exercise, leisure, parks, public land, urban, semi-primitive non-motorized

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In June 2002, President Bush issued Executive Order (E.O.) 13266 to improve the health of all U.S. citizens. With this E.O., physical activity was identified as one of the four health-protection pillars among responsible diet, preventative screening, and healthy choices concerning alcohol, tobacco, drugs, and safety. This E.O. has led to accentuated park and recreation agency interest in health benefits. As a result, 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 to promote use of the nation's public lands and water resources to enhance the health and well-being of the U.S. populous. Physical activity, in particular, is of interest as parks and recreation areas provide free to low-cost places for physical activity that are generally accessible to individuals from diverse populations—across cultures, socioeconomic classes, age groups, and abilities (Vinluan, 2005). However, disparities in access to these parks and recreation areas do exist (Taylor, Floyd, Whitt-Glover, & Brooks, 2007).

Statistics from 2007 indicate that in the U.S., 63.0% of adults were either overweight or obese (Centers for Disease Control and Prevention [CDC], 2008a) and only 48.8% of the U.S. population 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). A greater understanding of the factors that facilitate and constrain physical activity in different settings may improve agencies' ability to address obesity and sedentary lifestyles through targeted management strategies, similar to other management goals.

A number of frameworks exist that might help to understand physical activity across settings and recreation management areas. Among them, the Recreation Opportunity Spectrum (ROS) is the most widely known and applied framework (Manning, 1999). The framework provides managers a systematic way to consider the combination of biophysical, social, and managerial attributes present in an area and then create recreation opportunities based upon their combination. Based on that combination of attributes, the ROS system identifies land classes with their own recreation experience opportunities. The ROS is applicable across a variety of environments and recreation settings (Martin, Marsolais, & Rolloff, 2009) and, since inception, has been modified for use in Eastern U.S. federal (USDA Forest Service, 1985) and Eastern U.S. non-federal areas (More, Bulmer, Henzel, & Mates, 2003), as well

as expanded to a tourism opportunity spectrum (Butler & Waldbrook, 2003) and a water recreation opportunity spectrum (Haas, Aukerman, Lovejoy, & Welch, 2004). Certainly, opportunities for physical activity exist across the ROS. However, existing research on physical activity coupled with outdoor recreation focuses primarily on urban areas (e.g., Floyd, Spengler, Maddock, Gobster, & Suau, 2008; Shores & West, 2008).

In 2005, 80.8% of U.S. citizens lived in urban areas and, by 2030, this could reach 87% (United Nations Department of Economic and Social Affairs/Population Division, 2006). Therefore, understanding visitors to urban areas is important. The total area covered by urban parkland in the U.S. exceeds one million acres, and recreational opportunities in, and use of this area, are significant. For example, Lincoln Park in Chicago hosts more than 20 million users each year, while New York's Central Park annually hosts about 25 million visits, which is more than five times as many people who visit the Grand Canyon (Center for City Park Excellence, 2008). However, non-urban areas make up a significant part of the ROS. For example, more than 275 million recreation visits occurred in U.S. national parks, most of which are in non-urban areas. At the state level, 735 million visitors were reported by U.S. state parks (National Association of State Park Directors, 2001). As such, considering and comparing sites within the ROS on physical activity facilitators and constraints answers Godbey, Caldwell, Floyd, and Payne's (2005) call for such research to examine physical activity in different park types and addresses structural differences in settings as detailed by Bedimo-Rung, Mowen, and Cohen (2005). Further, it extends the notion of the recreation opportunity spectrum to include physical activity experience opportunities.

Background

Physical Activity in Parks and Recreation Areas

Recreation and park visits can contribute to physical activity and improved health (Bedimo-Rung et al., 2005; Cohen et al., 2007; Godbey et al., 2005; Ho, Payne, Orsega-Smith, & Godbey, 2003; Librett, Henderson, Godbey, & Morrow, 2007). Research illustrates 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, while approximately 90% of U.S. residents participate in outdoor recreation and 55% visit federal lands (RoperASW, 2004), 25% of U.S. adults report no leisure time physical activity in a given month (CDC, 2008b). Therefore, although the majority of people participate in outdoor recreation, many of these recreationists are still completely inactive in their leisure, and consequently, could increase and improve leisure time physical activity in parks and recreation areas.

One way to increase the use of parks and recreation areas for physical activity is to examine factors that facilitate as well as constrain visitors' physical activity and address them accordingly. Bedimo-Rung et al. (2005) identified six park characteristics associated with physical activity: features (including facilities, programs, and diversity of opportunity), conditions, access, aesthetics, safety, and politics. More specifically, attributes positively related to physical activity in parks as well as neighborhoods and trails include: availability of certain amenities (e.g., good lighting, toilets, and drinking water), well-designed and maintained paths, park size, cleanliness, naturalness, safety, appropriateness of development, and attractive scenery such as lakes and birdlife (Corti, Donovan, & Holman, 1996; Frumkin, 2003; Giles-Corti et al., 2005; Gobster, 1995; Gobster & Westphal, 2004). While causality was not measured, it may be assumed that these attributes encouraged a feeling of visitor safety in an inviting and attractive environment that allowed for physical activity to occur.

Despite the presence of factors that facilitate physical activity, constraints to recreation and physical activity in parks and recreation areas exist. Constraints are defined 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” (Jackson, 2000, p. 62). Investigations on constraints help managers and researchers to understand factors that influence recreation participation (Jackson, 2000) and, by extension, physical activity in parks and recreation areas. Constraints research suggests numerous factors that may influence physically active visits, including time, transportation, safety, cost, lack of skills, feeling like a minority, fatigue, and family obligations (Alexandris, Barkoukis, Tsozbatzoudis, & Grouios, 2003; Henderson & Ainsworth, 2000; Henderson et al., 2001; Miller & Brown, 2005). Similarly, public health research has identified 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 are all reasons people give for not being 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). However, investigations of constraints to physical activity of park visitors in particular are limited.

Recreation Opportunity Spectrum

Constraints to and facilitators of physical activity are likely present in all recreation settings. The ROS provides a well-known and widely used framework to differentiate the constraints and facilitators by type of area. The ROS directs managers to assess an area across several characteristics and, based on these criteria, assign it to one of six recreation opportunity classes. The characteristics assessed include those related to the biophysical environment: access (mode of transport and road development) and remoteness (visitor perception of being away); management presences such as site management (level of modification) and visitor management (regulation and control), as well as social factors of social encounters (number and type of other visitors) and visitor impacts. Based on these, an area is assigned into one of six opportunity classes: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, or urban. As access, management presence, encounters, and impacts increase, an area moves closer to the urban end of the spectrum. According to More, et al. (2003), ROS is “one of the most powerful inventory tools ever devised” that provides a rational and consistent basis for recreationally based land-management decisions. Given its power and the fact that several factors that facilitate physical activity are embedded in the ROS, using it to compare factors that influence physical activity seems both appropriate and efficient.

While research has investigated and compared a plethora of visitor characteristics within and across the ROS (e.g., Kyle, Absher, Hammitt, & Cavin, 2006; Ribe, 1994; Rosenthal & Walsh, 1986; Wollmuth, Schomaker, & Merriam, 1985), investigations comparing factors influencing physical activity across the ROS are non-existent. As land managers attempt to increase the physical activity of visitors on their lands, understanding such differences is critical as management actions are perceived differently in different types of recreation settings (Martin, Marsolais, & Rolloff, 2009). Given the E.O. issued at the start of the century, the paucity of research is understandable. Still, to move forward effectively in the 21st century, understanding physical activity constraints and facilitators within recreation settings is important. As the U.S. population urbanizes, it will be particularly important to examine differences between urban and non-urban settings. Previous research by Ewert

(1998), as well as Ewert and Hood (1995), found differences such as visitor characteristics, trip characteristics, and motivations between visitors to areas close to and further from urban sites. Along the same vein, Hoss and Brunson (2000) suggested these areas may be viewed by visitors with different normative standards and expectations. By extension, visitors to urban and semi-primitive non-motorized (SPNM) areas in the ROS may also perceive different factors that influence physical activity experience opportunities.

This paper examines differences in factors that influence physical activity in public park areas between visitors to urban and SPNM sites in the United States. Specifically, visitor and visit characteristics, visitor perceptions of site attributes important for physical activity, and constraints to physical activity were compared.

Method

Onsite questionnaires were administered to visitors across three urban sites and three SPNM areas to ascertain site attributes important for physical activity, constraints to physical activity, as well as visitor and visit characteristics.

Study Sites

Six areas in three states served as study sites. Two sites, one urban (i.e., city park) and one SPNM (i.e., national forest or state park), were selected in each of the following metropolitan areas: Los Angeles, CA; Chicago, IL; and Minneapolis, MN (Table 1). At each metropolitan area, the sites were selected because they were comparable in terms of their representation of their respective ROS attributes as well as access, amenities, design safety and neighborhood character (Vogel, 2005). Specifically, the urban sites were places with very easy access via highways and/or two-lane roads, no sense of remoteness, extensive and prevalent onsite management, frequent inter-party contact, and a high degree of visitor impacts. In contrast, the SPNM sites provided moderate-to-difficult access with paved or dirt roads, some to great deals of remoteness, moderate-to-low onsite management, were primarily natural looking, minimal to infrequent inter-party contact and low visitor impacts. For example, Powderhorn Park, the Minnesota urban site, is located within a Minneapolis neighborhood not far from the downtown, covers 65 acres of land and 12 acres of water, and features a recreation center and several athletic fields (Minneapolis Park & Recreation Board, 2008). The SPNM site in Minnesota, Wild River State Park, is about an hour drive north of Minneapolis and offers 35 miles of hiking, horseback riding, and cross-country skiing trails within a 6,803-acre park along the St. Croix River (Minnesota Department of Natural Resources, 2007).

Although not the focus of this analysis, an additional study goal was to examine differences among ethnic and racial minority groups. Therefore, the urban sites are located in racially- and ethnically-mixed neighborhoods.

Sampling

Bilingual (Spanish and English) interviewers contacted site visitors April through October of 2006. To obtain a representative sample, 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. Interviewers across all sites were trained to follow the same protocol and were also provided a field guide to refer to as needed. These trained field personnel also tracked response rates and logged information about "unapproachable" visitors (e. g., number in group, reason could not approach, activity, etc.), as some individuals were participating in activities that could

not be interrupted. For example, such visitors included those who were biking fast through the area or were in the middle of a soccer game. The response rates ranged between 54.8% and 87.3% across the six sites (Table 1).

Table 1. Sitetype, Locations, and Response Rates.

	Urban		Semi-primitive non-motorized	
ROS Classification Attributes^a	Biophysical: No minimum size; the setting contrasts with the surrounding cityscape, but urban elements are common and readily apparent. Vegetation often is exotic and manicured.		Biophysical: Minimum of 2,500 acres; area appears to be a predominantly natural or natural-appearing environment of relatively medium-to-large size. Interaction between users is low, but there is often evidence of other users.	
	Management: Facilities are designed to serve individuals or small groups but can accommodate high use. Facilities accommodate access by a variety of means, including pedestrian, motorized, mechanized, and mass transit.		Management: The area is managed so that minimum on-site controls and restrictions, if needed, are subtle. Nonmechanized uses predominate. Mechanized uses may be permitted; motorized use is not permitted. The area is managed for dispersed (low-density) pedestrian recreation. Trail uses are managed in designated, maintained corridors.	
	Social: Large numbers of users can be expected, both onsite and in nearby areas. Design generally offers users a choice between social encounters and solitude in urban settings.		Social: Moderately high probability of experiencing isolation from human development, use, and impact.	
Metropolitan Area	Site	Response rate	Site	Response rate
Los Angeles, CA	Hawkins Park	71.2% (n=210)	San Gabriel Canyon, Angeles Nat'l. Forest	54.8% (n=253)
Chicago, IL	Humboldt Park	86.5% (n=244)	Channahon State Park	65.3% (n=186)
Minneapolis, MN	Powderhorn Park	78.3% (n=470)	Wild River State Park	87.3% (n=363)
Total N		924	802	

^aMore, Bulmer, Henzel, & Mates, 2003

Instrument

The instrument assessed site attributes important for physical activity, constraints to physical activity, as well as visitor and visit characteristics, including site visit, overall physical activity, and demographics.

Site attributes important for physical activity at the site were measured with 15 items, including presence of restrooms, parking, benches, feeling safe from crime, and beauty based on attributes found to be important in previous research (e.g., Wilcox, Castro, King,

Housemann, & Brownson, 2000). Respondents were asked the question, “How important are each of the following to whether you choose this area for physical activity?” and asked respondents to rate each site attribute on a 5-point scale where 1 equaled very important, and 5 equaled very unimportant. Constraints to physical activity at the site were assessed with 18 items based on constraints assessed in previous research (e.g., Arnold & Shinew, 1998; Shinew, Floyd, & Parry, 2004; Wilcox et al., 2000), such as not enough time, no one to go with, and fear of physical assault. 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 on a 5-point scale, where 1 equaled not at all, and 5 equaled a great deal.

In terms of visit characteristics, the questionnaire asked respondents to report transportation mode to the site, travel time and distance, total visit time, the main activity engaged in during the visit, as well as the time participated in that main activity. In addition, respondents were asked to indicate if they come to the area for physical activity with a dichotomous yes/no response choice. This question is worded to capture those individuals who may go to the area for physical activity as a secondary rather than primary reason as well.

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. These questions were modeled after physical activity questions from the Behavioral Risk Factor Surveillance System (BRFSS; CDC, 2005) and International Physical Activity Questionnaire (IPAQ, 2002) that measure moderate and vigorous intensity level activities. 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. Following the BRFSS and IPAQ, respondents were only asked to report on physical activity they engaged in for at least 10 minutes at a time. Respondents also indicated 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, as well as physical descriptors of height and weight.

The instrument was pretested and, as a result, several questions were added to capture additional information identified during the pretest. Specifically, travel time was added to account for individuals who walked to the site, respondents were asked how long they participated in their main activity, and being near water and having rental equipment available were added to the list of site attributes. In addition, the physical activity questions were reworded to model the BRFSS questionnaire and query both frequency and duration as well as include a ‘don’t know’ response option. Finally, a request for respondents’ full address was removed to reduce respondent burden. The final three-page interviewer-administered instrument was translated to Spanish and back translated to English.

Data Analysis

Questionnaire data were entered and analyzed using SPSS 13. Descriptive analyses provided means, standard deviations, and frequencies to describe the sample and variables of interest. Physical activity duration items were winsorized to address outliers. Respondents were categorized regarding meeting physical activity recommendations or not following CDC guidelines and data-reporting procedures. Similar to CDC data-collection efforts, 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). However, given that these data were only used for purposes of comparison to CDC national data, this possible underestimation was not of issue in this analysis. BMI was calculated by the height and weight

information respondents reported: $BMI = [(weight\ in\ pounds * 703) / (height\ in\ inches^2)]$. 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).

T-tests and Pearson Chi-Square tests compared the urban and SPNM site visitors on the variables of interest. To reduce family-wise error, the Bonferroni technique was employed (Howell, 1997). Constraints to physical activity were compared only between the California and Minnesota sites due to a difference in data collection for that question in Illinois. Specifically, while all the other questions were asked the same across the sites, the constraints data collected in Illinois used a filter that did not require all study participants to respond to that question. Therefore constraint data were not comparable to the other sites.

Results

Demographic composition differed between visitors to urban and SPNM sites. Within both classifications, respondents were rather evenly split between males and females. However, the urban sample was slightly more female (54.2%) versus the slightly more male (54.8%) SPNM sample ($\chi^2=13.69$; $p<0.001$). The average respondent was middle aged, with visitors to the SPNM sites older ($M = 40.77$) than the urban site visitors ($M = 37.73$; Table 2). The majority of respondents at SPNM sites were White, non-Hispanic/Latino (67.0%) followed by Hispanic/Latino of any race (22.2%). In contrast, the majority of respondents at urban sites were Hispanic/Latino of any race (50.5%) followed by White, non-Hispanic/Latino (36.4%), and the relative proportions differed significantly between the two site types ($\chi^2=213.08$; $p<0.001$). In terms of physical description, the average visitor to both area types had a BMI of around 26, which is considered overweight, and 53% of all respondents were classified as overweight or obese.

Similarly, the majority of respondents to both areas reported coming to the area to do something physically active (69.3% urban; 73.0% SPNM). More than half of urban visitors indicated the site where they were contacted was also the usual location of their physical activity (59.4%), followed by their home (32.4%), a different park/recreation area (23.2%), and fitness center (19.2%; Figure 1). In contrast, among SPNM visitors, 51.2% reported home as the usual location of their physical activity, followed by a different park/recreation area (33.8%), fitness center (23.2%), and the site where contacted (14.7%). The majority of respondents were meeting physical activity requirements (66.2%), although 1.6% of the respondents reported being completely inactive. On average, urban respondents engaged in moderate physical activity more days per week than SPNM visitors ($M= 4.84$ and $M= 4.43$, respectively), although both groups participated in moderate activities for an hour and half each of those days (Table 2). Urban and SPNM respondents reported the same amount of vigorous activity levels: on average around 45 minutes per day, just more than two days per week.

Most frequently, SPNM visitors engaged in walking/hiking, biking, and relaxing during their visit. Main activities for urban visitors differed slightly as they reported most frequently engaging in walking/hiking, playing with kids, and relaxing. One notable difference is among those walking/hiking at the urban sites, 40.4% ($n=132$) were dog walking compared to 7.9% ($n=17$) at the SPNM sites.

Perhaps not surprisingly, significant differences were found between urban and SPNM visitors on travel distance and time, as well as visit measures (Table 2). Specifically, SPNM respondents traveled a greater distance in terms of miles and time, had a longer stay and spent more time in the main activity. Of the urban visitors, 94.4% lived within 10 miles of the site, and 90.2% lived within five miles. In addition, nearly 10% of SPNM visitors lived within 10 miles of the site, while 38.0% traveled more than 50 miles. Further, while almost

Table 2. Visitor and Visit Characteristics.

Visitor and Visit Characteristics	Urban (<i>n</i> =924)			SPNM ^a (<i>n</i> =802)			Test statistics	
	<i>n</i> ^b	<i>M</i>	<i>SD</i>	<i>n</i> ^b	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>
<i>Demographics</i>								
Age in years	905	37.73	12.92	799	40.77	13.32	1702	4.79***
BMI	851	26.13	5.21	772	25.71	4.31	1608	1.81
<i>Physical Activity</i>								
Days per week moderate level	858	4.84	2.10	719	4.43	1.96	1558	3.95***
Days per week vigorous level	831	2.23	2.20	694	2.23	2.06	1504	0.01
Time per day moderate level (hrs:mins)	884	1:32	1:51	742	1:34	1:56	1624	0.38
Time per day vigorous level (hrs:mins)	857	0:41	0:45	725	0:47	0:50	1473	2.41
<i>Travel</i>								
How long did it take to get here (hrs:mins)	909	0:12	0:27	754	1:01	0:44	1203	26.39***
Miles traveled to get here	833	3.33	18:46	645	53.37	93.32	683	13.41***
<i>Visit</i>								
How long stay here (hrs:mins)	875	1:35	1:31	476	3:51	3:15	592	14.42***
How long participate in main activity	840	1:24	1:27	730	3:25	4:00	896	12.80***

^a*Semi-primitive non-motorized*^b*Does not include valid response options "do not know" or "not applicable"*****p*<.001

all SPNM visitors drove to the area (97.7%), one-third of urban visitors drove (33.0%) while the majority walked (58.9%).

Site Attributes Important for Physical Activity

Two site attributes were among the most important for physical activity for both groups: paths (*M*=1.38 urban; *M*=1.47 SPNM) and site beauty (*M*= 1.39 urban; *M*=1.36 SPNM; Table 3). In addition, urban visitors also reported feeling safe from crime as a most important attribute (*M*=1.39), while SPNM visitors identified cleanliness of facilities (*M*=1.46) as a most important attribute for physical activity. Both groups rated the availability of rental equipment as the least important attribute for their physical activity (*M*=2.94 urban; *M*=2.77 SPNM), although they were still somewhat important based on the scale.

Urban and SPNM visitors differed significantly on nine of the 13 site attribute items. Specifically, urban visitors rated feeling safe from crime, easy to get here, close to home,

Figure 1. Location of Usual Physical Activity.

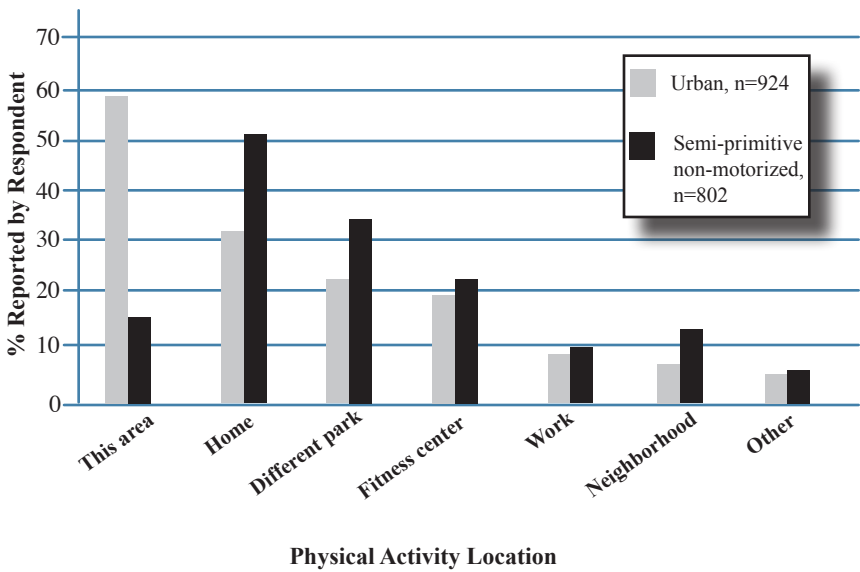


Table 3. Importance of Site Attributes for Physical Activity.

Site Attributes	Urban (n=924)			SPNM ^a (n=802)			Test statistics	
	n ^c	M	SD	n ^c	M	SD	df	t
Walking/hiking/biking paths	913	1.38	0.70	789	1.47	0.83	1547	246
Beauty	913	1.39	0.63	793	1.34	0.60	1693	1.57
Feeling safe from crime	912	1.39	0.71	782	1.52	0.88	1503	3.21**
Maintenance	908	1.50	0.68	789	1.55	0.75	1606	1.49
Easy to get here	909	1.54	0.78	789	1.85	0.92	1552	7.44**
Cleanliness of facilities	895	1.56	0.83	788	1.46	0.70	1678	2.73**
Close to home	909	1.56	0.87	785	2.19	1.16	1443	12.45**
Feeling safe from injury	910	1.67	0.97	781	1.73	0.98	1689	1.25
Restrooms	897	1.76	1.04	791	1.57	0.86	1679	4.17**
Being near water	898	1.79	0.97	791	1.68	0.87	1687	2.58
Benches	909	1.82	1.01	786	2.35	1.25	1501	9.52**
Drinking fountains	899	1.85	1.04	779	2.23	1.23	1528	6.87**
Lighting	752	1.85	1.04	594	2.64	1.29	1124	12.08**
Parking	827	2.36	1.39	789	1.67	0.89	1411	11.83**
Rental equipment available	604	2.94	1.42	559	2.77	1.25	1158	2.21

^aResponses were based on a 5-point scale with 1=very important and 5=very unimportant

^bSemi-primitive non-motorized

^cDoes not include valid response option “not applicable”

**p*<.007; **<.003; Note: Bonferroni-corrected significance level to control for family-wise error (.1/15=.007; .05/15=.003).

benches, drinking fountains, and lighting as more important for physical activity than SPNM visitors. Urban visitors also rated cleanliness of facilities, restrooms and parking as less important than SPNM visitors.

Constraints to Physical Activity

In general, visitors reported few constraints to physical activity (Table 4). All respondents agreed not having enough time ($M=2.98$ urban; $M=3.41$ SPNM) and family obligations ($M=2.74$ urban; $M=3.01$ SPNM) were the most constraining factors of those presented. However, not having enough energy was the next highest rated constraint for urban visitors ($M=2.61$) compared to having no one to go with for SPNM visitors ($M=2.34$), although even so, respondents somewhat disagreed with these items as constraints.

Visitors to urban and SPNM sites differed significantly on 15 of the 18 constraints items. Generally, urban visitors reported items related to onsite issues (e.g., not enough lighting, fear

Table 4. Constraints to Physical Activity^a

Constraints ^b	Urban (n=924)			SPNM ^a (n=802)			Test statistics	
	n ^d	M	SD	n ^d	M	SD	df	t
Not enough time	665	2.98	1.30	602	3.41	1.25	1260	5.98**
Family obligations	667	2.74	1.30	599	3.01	1.30	1264	3.62**
Not enough energy	665	2.61	1.20	593	2.29	1.14	1252	4.87**
Fear of physical assault	667	2.53	1.18	602	1.98	1.01	1263	9.01**
Gangs coming here	649	2.52	1.20	483	2.06	1.21	1130	6.44**
Not enough lighting	589	2.44	1.02	563	1.98	0.93	1148	7.97**
Fear of sexual assault	668	2.44	1.16	600	1.89	0.96	1258	9.10**
Fear of theft	667	2.43	1.13	599	2.04	1.02	1264	6.34**
People drinking alcohol	652	2.36	1.12	576	2.06	1.04	1223	4.88**
Fear of racial conflict	670	2.28	1.04	598	1.86	0.84	1266	7.56**
This area does not offer activities I want	662	2.16	1.07	598	1.93	0.99	1258	3.96**
Having no one to go with	668	2.09	1.02	605	2.34	1.22	1180	3.99**
Feeling unwelcome	668	2.05	0.95	602	1.81	0.90	1268	4.63**
Location is not close enough to my home	656	1.99	1.09	600	2.25	1.17	1225	4.02**
There are too many people here	655	1.99	0.94	593	2.04	0.98	1222	0.88
Not enough money	644	1.85	0.84	593	2.17	1.13	1092	5.68**
The bus and train don't come here	557	1.79	0.83	470	1.76	0.94	944	0.54
This area does not have enough trees and grass	663	1.78	0.81	604	1.71	0.94	1194	1.47

^aComparisons between urban and semi-primitive non-motorized in California and Minnesota sites only

^bResponses were based on a 5-point scale with 1=strongly disagree and 5=strongly agree

^cSemi-primitive non-motorized

^dDoes not include valid response option "not applicable"

** $p < .003$; Note: Bonferroni-corrected significance level to control for family-wise error (.05/18 = .003).

of physical assault, feeling unwelcome, fear of racial conflict) as greater constraints to physical activity, while SPNM visitors were more constrained by items pertaining to the logistics of getting to the site (e.g., not enough time, having no one to go with, location not close enough to my home).

Discussion and Management Implications

Although the majority of study respondents met the CDC's recommended level of physical activity, about one-third of visitors to both sites did not. Further, like the average U.S. adult (Ogden, Fryar, Carroll, & Flegal, 2004; CDC, 2008a), visitors to both urban and SPNM sites had an average BMI considered to be overweight, with more than half classified as overweight or obese. Therefore, there may be opportunities for recreation and park managers to encourage more physical activity and subsequent health benefits like reduced BMI. Onsite questionnaires found similarities and differences in site attributes important for and constraints to physical activity between visitors to urban and SPNM sites. These results suggest both opportunities and challenges for managers and planners across the ROS interested in physical activity as well as avenues for future study.

Similarities in Important Site Attributes and Constraints

Similarities emerged in site attributes important for physical activity as visitors to both urban and SPNM sites consistently rated the physical setting characteristics of site beauty and paths as important for physical activity. Given the importance of paths across the sites, managers are encouraged to pay particular attention to path/trail design and connectivity. Comprehensive path/trail maps for an area that includes local, state, and federal maps could encourage activity on and off-site, across recreation areas. Such maps could provide information on trail layouts and routes that provide for a variety of distances and challenges. Enjoyable scenery and aesthetics have also positively associated with physical activity in previous research (e.g., Brownson et al., 2001; King et al., 2000; Trost et al., 2002). Subsequently, managers can continue to highlight the importance of aesthetic management in their own plans as well as promote these aesthetic attributes in their marketing for physical activity. Further, this finding highlights the importance of vegetation placement and maintenance to influence site beauty.

In addition to important site attributes, some similarities also emerged in constraints to physical activity at the sites. Similar to previous research examining factors influencing physical activity (e.g., Salmon et al., 2003; Trost et al., 2002), time and family obligations were identified as the most constraining factors to visitors to both urban and SPNM sites. Therefore, considering site use for multiple purposes, such as family physical activity with diverse activity opportunities across an age range, may be useful. For example, playgrounds located proximate to circular walking paths where adults can walk or run while children play within eyesight could meet multiple motivations and create opportunities for greater physical activity.

Differences in Important Site Attributes and Constraints

Differences in site attributes important for and constraints to physical activity at the sites were also found. Like Bedimo-Rung et al. (2005), facilities were important for both groups, but SPNM visitors rated the availability of restrooms and parking, as well as cleanliness of facilities, as more important site attributes than the urban visitors. These findings are the inverse of what one would expect from "typical" SPNM settings in that the presence of facilities is typically not as desirable as visitors seek more natural environments. Further research is of interest in this area to find out why such amenities are important to SPNM visitors for physical activity. One possible explanation could be that urban visitors may not

need to use these particular facilities as much, and as such, they are not as important for physical activity. These attributes may be more important to SPNM visitors, as they do not have the option of returning home and must use the facilities provided. Site design assessments could be useful to identify if and how to improve the area to address visitor safety concerns particularly at urban sites, as well as improve connectivity among sites. In contrast, site design considerations at SPNM sites may pertain to amenities such as parking and restrooms, as well as the cleanliness of the facilities. For example, the availability of clean restrooms, including showers, near trail head parking lots may be desired for visitors to change and clean up in after an active outing. Therefore, while it is important for SPNM sites to commit resources for maintaining these attributes, urban areas may be better suited to direct more resources to attributes such as lighting, benches, and drinking fountains to promote physical activity through better perceived safety and improved facilities for resting and replenishing during exercise.

Like past research (Coble, Selin, & Erickson, 2003; Shinew et al., 2004), results indicate safety is of primary concern to visitors of urban sites. Given people are least active when concerned about safety (Kirtland et al., 2003), continued efforts to design and rehabilitate sites with attention toward public safety is essential. Safety concerns (e.g., fear of physical or sexual assault) and other onsite issues (e.g., feeling unwelcome and fear or racial conflict) constrained urban visitors more than SPNM visitors. Cumulatively, these urban constraints have implications for management presence, personnel training, and site design. In addition, urban sites may need to provide additional management presence (like call boxes) or personnel training regarding customer service to ensure all visitors feel safe and welcome. Certainly, this applies to settings across the ROS, as visitors to the SPNM sites also indicated that feeling safe from crime was very important. Comprehensive service and diversity training is essential as visitors interact with all levels of park staff, and may help staff address conflicts that occur between visitors. Further, additional qualitative research could provide insight as to why urban visitors are not feeling as safe or welcome as SPNM visitors and, perhaps more importantly, why non-visitors stay away from the sites. Knowledge of visitor perceptions regarding safety and feelings of welcomeness can guide more customer-focused management interactions, provide input for interpretive material design, as well as suggest an opportunity for consumer research to monitor perceptions of safety and welcomeness. For example, vegetation placement can enhance visual access as well as increase perceptions of safety.

In contrast, but not surprisingly, SPNM visitors were more constrained than urban visitors by factors relating to the logistics of getting to the site. Therefore, managers could consider marketing efforts to increase awareness of the site as part of a multipurpose trip. For instance, visits could be bundled with other regional destinations to reduce the perception of time and distance required to travel. Similarly, creating active clubs or networks may assist visitors to overcome the constraint of not having physical activity partners. Further, SPNM sites could attend to park accessibility concerns by assisting in efforts to coordinate visitors to ease interpersonal constraints and minimize perceptions of time and distance issues associated with urban-distant sites. Although SPNM visitors did not identify a lack of public transportation as a constraint, this study's participants were already onsite. Those with transportation constraints may not have been able to visit and therefore would not have been included in the sample. Subsequently, studies investigating non-visitors could provide additional insight into transportation, as well as other constraints.

Visitors' Overall Physical Activity

Beyond important site attributes for physical activity and constraints to physical activity at urban and SPNM sites, visit characteristics also provide some insight into ways

management may be able to increase visitors' physical activity. On average, urban visitors engaged in moderate physical activity on more days per week than SPNM visitors. Further, 8 out of 10 urban respondents indicated the site in which they were contacted, or another park/recreation area, as a usual location for physical activity. As such, these findings support previous work that indicates city parks offer convenient locations important for regular physical activity (King et al., 2003). Given the convenience and relative access to these urban sites for physical activity, understanding non-visitors is an essential step for health and physical activity promotion. Using sites as health fair locations could attract non-users, increase awareness of the site and the advantages of physical activity, as well as promote health holistically. Subsequently, managers are encouraged to not only promote urban sites as a location for physical activity, but to tailor that message that these sites are convenient locations to use as part of a regular exercise regime. For example, just as health clubs provide visitors the opportunity to "log" their own activities and progress, recreation sites could create and similarly store online or onsite places where visitors could log their activities and progress toward physical activity goals.

In contrast, although SPNM sites are still locations where visitors obtain physical activity, they are not as often a primary location and therefore could be promoted differently than urban sites. As visitors to SPNM sites traveled farther in terms of time and distance, stayed longer, and spent more time in their main activity, these visits may require more visitor planning. Therefore, rather than promoting these sites as locations to incorporate in regular exercise regimes, SPNM sites may choose to instead focus on incorporating physical activity as an additional element of a broader park experience or even as a physical activity destination in and of itself focusing on its size, distance of trails, and opportunities for challenge. Further, SPNM sites can perhaps promote themselves as physical activity sanctuaries, or natural spas, that might provide comprehensive mental and physical health opportunities without the high cost associated with "traditional" centers. For example, promotions of guided interpretive tours may also highlight physical activity information and benefits from participation in physical activity. SPNM sites could also present themselves as an alternative or extension to the regular activity done closer to the urban sites as a way to mix up the exercise regime. For example, much like history passports, physical activity passports to SPNM sites across the ROS could be created with prizes awarded for completing a certain number of physical activities in SPNM parks and recreation areas.

More than half of the respondents walked to urban sites while few walked to SPNM sites. This supports previous work that suggests city parks may influence physical activity levels not only as activity within the park but as destinations within neighborhoods (Greenburg & Renne, 2005; Powell, Martin, & Chowdhury, 2003). However, as more than a third of the urban visitors drove to the site, yet 90% live within five miles, opportunities to encourage active transportation for increased health benefits is apparent. In addition, nearly 10% of SPNM visitors lived within 10 miles of the site. Therefore, while for many of the SPNM park visitors the site would not be practical for active transportation, for those using it as their "local" park, promoting active transportation may be useful. Therefore, as Godbey et al. (2005) suggested, the connection between parks and transportation planning must be strengthened. An audit of site Web sites and written materials would be an initial step to understanding if and to what extent park and recreation is partnering with transportation. For example, providing maps of the entire area surrounding a park site can indicate to local visitors how they can access the area from their home without driving. If area Web sites provide links to mapping programs, for example, they can also provide information about the benefits of the additional miles toward individual physical activity goals. In addition, planners could examine the area surrounding a park to consider factors such as the

connectivity to other parks and destinations, as well as the surrounding neighborhoods' walkability in terms of access, visual quality, and safety (Lee & Moudon, 2004).

While walking/hiking was the most common activity at both urban and SPNM sites, two out of every five individuals at urban sites were dog walking. Subsequently, urban site managers should attend to its potential impact on other users. For example, it may be necessary to remind visitors to pick up after their dogs and post signs requiring all dogs to be on leashes to prevent conflicts with other users. However, while certain aspects of the presence of dogs may seem challenging, dog walking could be promoted, as it is associated with achieving recommended levels of walking (Giles-Corti & Donovan, 2003) and may contribute to a physically active lifestyle (Ham & Epping, 2006). Therefore, across the ROS, managers are encouraged to consider how to better accommodate dog walkers through dog park and trail designs. Further, contrary to common assumptions, the presence of unattended dogs has been found to have either no association (Huston, Evenson, Bors, & Gizlice, 2003) or even a positive association with physical activity (King et al., 2000).

Conclusions

This study found both similarities and differences between visitors to urban and SPNM sites in site attributes important for and constraints to physical activity, as well as visit characteristics. The similarities suggest that some site attributes important for physical activity and constraints to physical activity may be consistent across the ROS. Therefore, managers are encouraged to collaborate to promote and manage these lands as places for physical activity and subsequent health benefits. However, differences in important site attributes for physical activity and constraints to physical activity between urban and SPNM sites also emerged and indicate that managers need to consider tailoring some of their physical activity promotion, programming, and management efforts across the ROS classes. In addition, results indicate the real opportunity to create a physical activity opportunity spectrum as part of a local or regional recreation management system. Such multiple-system cooperation could create expanded physical activity across the opportunity spectrum.

To assist in the promotion of physical activity in parks and recreation areas across the ROS, managers and administrators are encouraged to coordinate efforts with public health resources. Local health organizations, such as health care providers, insurance companies, and fitness businesses may be used to help promote parks and recreation areas as locations for physical activity and as part of overall community health. Joint membership fees or special passes usable at both traditional exercise facilities and recreation sites are one idea, and another opportunity includes joint special physical activity events that incorporate facilities from both types of organizations. Possible partnerships, such as trail running programs or fitness classes in the outdoors, can increase physical activity opportunities and expand consumer bases as well, given the number of respondents who do physical activity at fitness centers. Health promotions that establish a baseline of visitor health in terms of BMI and heart rate at the site, for example, can be used to encourage visitors to be physically active and self-monitor their health. In addition, coordination efforts may open the doors to new partnerships and funding opportunities previously overlooked. As funding organizations continually increase their emphasis on partnerships and engagement, such collaborations are both timely and mutually beneficial.

Investigations comparing physical activity and factors related to it across the ROS are nonexistent. This paper starts to address that paucity of research. The results from this comparison point to opportunities for managers and planners across outdoor recreation settings to promote the health of individuals and communities. First, the promotion and management approaches for physical activity can vary across the ROS for maximum effectiveness. Second, the identified site attributes important for and constraints to physical

activity suggest opportunities for physical activity site design strategies, visitor programs, and inter-agency coordination. Finally, as the majority of visitors reported visiting the area to do something physically active, recreation professionals at both opportunity areas are encouraged to coordinate or continue coordinated efforts with public health resources. Given the number of citizens who are overweight and obese, combining the resources and efforts of both recreation and public health professionals can increase efficiency and is essential across the recreation opportunity spectrum.

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