Journal of Leisure Research
2014, Vol. 46, No. 5, pp. 540–562

Physical Activity Levels and Preferences of Ethnically Diverse Visitors to Georgia State Parks

Lincoln Larson
Clemson University

Jason W. Whiting
California State University, Fresno

Gary T. Green
University of Georgia

J. M. Bowker
USDA Forest Service

Abstract

Parks provide many outdoor recreation opportunities that encourage physical activity and healthy lifestyles, and research has recently begun to explore the demographic, social, and environmental factors associated with park-based activity levels, particularly outside of urban areas. This study used a mixed methods approach to investigate physical activity levels and correlates among demographically diverse state park visitors in Georgia. Data were collected during summer 2010 via onsite intercept surveys (n = 1,073) and structured observations of visitor behavior (n = 9,453 individuals observed). Analyses revealed substantial levels of activity during park visits and highlighted links between socially oriented recreation participation and park-based physical activity, particularly for Latinos and African Americans. Results could provide park managers with insightful information for promoting and sustaining park-based physical activity across diverse communities.

Keywords: *mixed methods, outdoor recreation, physical activity, race/ethnicity, state parks*

Lincoln R. Larson is an assistant professor in the Department of Park, Recreation, & Tourism Management at Clemson University. **Jason W. Whiting** is an assistant professor in the Department of Recreation Administration, California State University, Fresno. **Gary T. Green** is an associate professor in the Warnell School of Forestry & Natural Resources, University of Georgia. **J. M. Bowker** is a research social scientist in the USDA Forest Service, Southern Research Station.
This study was part of larger dissertation research project titled "State Park Use and Outdoor Recreation Benefits across Demographically Diverse Populations in Georgia" conducted by Lincoln Larson while at the University of Georgia. The study was partially funded by a grant from the Georgia Department of Natural Resources, Parks, Recreation, and Historic Sites Division. The authors wish to acknowledge the Parks, Recreation and Historic Sites Division of the Georgia Department of Natural Resources for its financial support and assistance with this project.
Please send correspondence to Lincoln Larson, LRL66@cornell.edu.

Introduction

Researchers and health professionals have attributed inadequate levels of physical activity to the growing obesity epidemic (Ogden et al., 2006), increasing incidence of cardiovascular disease (Sofi, Capalbo, Cesari, Abbate, & Gensini, 2008), and potential declines in life expectancy observed in the U.S. population (Olshansky et al., 2005). Although the health benefits of active lifestyles are widely recognized, many Americans (estimates range from 51% to 55%) fail to obtain recommended levels of physical activity (i.e., 75 minutes of vigorous or 150 minutes of moderate activity per week) (CDC, 2010; Macera et al., 2005; U.S. Department of Health and Human Services, 2000). Furthermore, about 25% of Americans report no leisure-time physical activity (CDC, 2005), and increasing sedentary behavior may be a key factor contributing to declines in physical fitness (Brownson, Boehmer, & Luke, 2005). Adverse health effects associated with physical inactivity are especially problematic within low-income, racial, and ethnic minority communities (Crespo, Smit, Anderson, Carter-Pokras, & Ainsworth, 2000; Floyd, Taylor, & Whitt-Glover, 2009; Pratt, 2008; Thomas, Eberly, Smith, Neaton, & Stamler, 2005). For example, data show more than 75% of the nation's rapidly increasing Latino population is overweight or obese (Marquez & McAuley, 2006; Ogden et al., 2006). As the costs and consequences associated with escalating inactivity place additional stress on the American health care system (Rosenberger, Sneh, Phipps, & Gurvitch, 2005), the identification and development of strategies that support healthy, active lifestyles are and will become even more important.

Studies indicate people's physical activity levels could be improved through a holistic approach to health promotion that emphasizes environmental surroundings as well as intra-personal (e.g., internal beliefs and motivations) and interpersonal factors (e.g., social relationships) (Sallis et al., 2006; Shores & West, 2008a; U.S. Department of Health and Human Services, 2000). Roux et al. (2008) found the most cost-effective and beneficial approaches to encouraging physical activity involve combinations of individually adapted health behaviors, social support, and community-wide campaigns. The influence of community-level variables in physical activity promotion underscores the potential utility of parks for addressing America's physical activity problems (Mowen et al., 2008). By supplying a range of opportunities for outdoor recreation, public parks create an environment conducive to physical activity that may help to improve health for individuals and communities (Bedimo-Rung, Mowen, & Cohen, 2005; Godbey, Caldwell, Floyd, & Payne, 2005a; Godbey & Mowen, 2010; Ho, Payne, Orsega-Smith, & Godbey, 2003). Recently, studies have begun to address the effect of park use on physical activity participation, but more research is needed to evaluate public parks' potential to provide accessible, low-cost opportunities for physical activity across a diverse cross section of the American public (Godbey & Mowen, 2010).

Early research examining links between parks and physical activity focused on the access and availability of recreation spaces and facilities. Many of these studies revealed relationships between residential proximity to parks and physical activity (Giles-Corti et al., 2005; Kaczynski, Potwarka, Smale, & Havitz, 2009; Mowen, Orsega-Smith, Payne, Ainsworth, & Godbey, 2007). For example, Kaczynski and Henderson's (2007) literature review found 40 of 50 published articles examining parks and the physical activity that occurred within those parks reported positive associations between park and recreation attributes and physical activity levels, although there was a wide range in the strength of association. This finding suggests that physical inactivity observed in low-income minority neighborhoods may be mitigated by access to physical activity-related facilities and amenities (Crawford et al., 2008; Diez Roux et al., 2007; Gordon-Larsen,

Nelson, Page, & Popkin, 2006; Powell, Slater, Chaloupka, & Harper, 2006; Stodolska & Shinew, 2010). However, proximity to parks is only one factor influencing physical activity. Actual park use patterns and preferences are also important predictors of positive health outcomes (Mowen, Kaczynski, & Cohen, 2008), and these variables could provide important insight into physical activity investigations focused on populations at higher risk of obesity.

Studies of physical activity and park use have historically relied heavily on self-reported measures (Godbey, Caldwell, Floyd, & Payne, 2005b; Rutten et al., 2001). Although self-reports are practical, cost-effective methods for assessing the type of physical activities and context of those activities (particularly in large samples), their validity across longer temporal scales and within distinct racial/ethnic and income groups has been questioned (Rundle et al., 2007; Sallis & Saelens, 2000). A combination of subjective and objective data-collection measures may therefore be needed to accurately assess park-based physical activity levels (Kruger, Mowen, & Librett, 2007). Recent innovations have facilitated the development of objective behavioral metrics to accomplish this goal (McKenzie, Cohen, Sehgal, Williamson, & Golinelli, 2006). Using observational methods, researchers are now examining and describing park-based physical activity in unprecedented detail. For example, observation-based studies of urban park users in Chicago and Tampa revealed that 65% of visitors were engaged in sedentary behaviors (Floyd, Spengler, Maddock, Gobster, & Suau, 2008). Studies of urban park users in Los Angeles yielded similar results, where about two thirds of all visitors observed were in a sedentary state (Cohen et al., 2007; McKenzie et al., 2006).

Research is also beginning to identify specific park features associated with physical activity (Rung, Mowen, Broyles, & Gustat, 2011). Multiple studies have shown observed physical activity levels across demographic groups are generally lowest at picnic shelters and highest around sport fields and courts, playgrounds, and paved paths (Floyd et al., 2008; Kaczynski, Potwarka, & Saelens, 2008; Shores & West, 2008a). These initial findings have important management and policy implications with respect to park design practices. However, more research is needed to identify features that facilitate or constrain park-based activity across a wide range of user groups and income levels (Mowen, 2010; Stodolska, Shinew, & Li, 2010).

Although research linking parks and physical activity has typically focused on tools and techniques for assessing activity in urban environments (Bedimo-Rung, Gustat, Tompkins, Rice, & Thomson, 2006; Saelens et al., 2006), studies are needed to examine rural or exurban areas (i.e., regions beyond the city suburbs) and account for recreation opportunities in different types of parks at the state and national levels (Boone-Heinonen, Casanova, Richardson, & Gordon-Larsen, 2010; Godbey et al., 2005b; Kline, Rosenberger, & White, 2011). Evidence collected from national forests and state parks across the rural-to-urban spectrum suggests users of parks in more remote areas may display distinct physical activity behaviors and preferences compared to urban park visitors (Wilhelm-Stanis, Schneider, Shinew, Chavez, & Vogel, 2009). For example, rural park use is often clustered around weekend days, and rural park users may be less physically active during visits than urban park visitors (Shores & West, 2010). The limited availability of and participation in outdoor recreation activities could help to explain the lower levels of leisure-time physical activity and higher incidence of obesity reported in rural communities (May, 2011; Michimi & Wimberly, 2012; Wilcox, Castro, King, Housemann, & Brownson, 2000). Despite these patterns, other researchers have noted high levels of physical activity in state parks (Mowen, Trauntvein, Graefe, & Son, 2012; Wilhelm-Stanis, Schneider, & Anderson, 2009), suggesting that more research is needed to better understand park-based activity trends across various settings and populations and the factors that influence them. These studies may be especially

important in state parks, where American's spend approximately one-third of their total nature recreation time (Siikamaki, 2011).

Research on park-based physical activity is minimal in the South, a region known for a lack of physical activity among a number of its residents—especially those from racial and ethnic minority groups (Macera et al., 2005; Michimi & Wimberly, 2010). In Georgia, for example, one in three adults is currently obese, and an additional 37% are overweight. The state's obesity rates have doubled in the past 15 years and consistently rank among the highest in the country (Fahmy, 2011; Georgia Department of Public Health, 2011). Furthermore, only 46% of adults in Georgia are regularly active, and the percentage of regularly active individuals among Latinos (28%) and African Americans (38%) is even lower (Falb, Kanny, Thompson, Wu, & Powell, 2006; Georgia Department of Public Health, 2010). For all of these reasons, efforts to identify strategies that contribute to physical activity as a means to promote better public health within the state of Georgia are critically important.

The purpose of this study was to investigate factors associated with state park-based physical activity in Georgia. Using a mixed-methods approach targeting state parks in northern Georgia, researchers examined park characteristics, features, and facilities as well as other factors that influence physical activity, with a particular emphasis on high-risk groups such as low income racial/ethnic minorities (Flores, 2008; Pearce, 1999; Pratt, 2008). The specific objectives of this study were to examine: (1) self-reported park-based physical activity levels and correlates (using intercept surveys); (2) observed park-based physical activity levels and correlates (using systematic observation procedures); and (3) physical activity site preferences among diverse groups of state park visitors.

Research Methods

Study Setting

The study focused on three state parks in northern Georgia: Fort Mountain, Fort Yargo, and Red Top Mountain. Selected parks were located 40 to 90 miles from downtown Atlanta, ranged in size from 1,776 to 3,712 acres, and included similar facilities and amenities (e.g., lake, beach, picnic areas, campgrounds, at least 14 miles of hiking and biking trails).Park visitors, especially day users, were relatively diverse racially and ethnically. Onsite data collection, conducted from May–September 2010 (46 total sampling days), used two distinct sampling methods, intercept surveys and behavioral observation, to target recreation hotspots, or zones of high visitor activity, within each park. Sampling procedures are discussed in more detail in Whiting, Larson, and Green (2012); analyses in this paper focus on a subset of data collected in that larger study. For intercept surveys (n = 1,073 surveys focused specifically on adults' physical activity collected across 115 sampling periods), target areas included beaches, picnic areas, and campgrounds. For behavioral observations (n = 9,453 individual observations across 217 sampling periods), target areas included lakefront (beaches and adjacent picnic areas) and trail/multi-use (trailheads and neighboring courts and fields) zones. Sampling dates at state parks were based on a stratified random sampling protocol during the summer season (Memorial Day through Labor Day). The four strata were Wednesdays (at the time of the study, this was the only free admission day at Georgia State Parks), other week days, weekend days, and holiday weekends (Memorial Day, Independence Day, and Labor Day). Then, research days were randomly assigned *a priori* subject to the constraint that researchers visited each park on at least three weekdays, at least two

Wednesdays, at least six weekend days, and at least one holiday weekend day. Multiple intercept survey and observation sessions occurred in each park during each sampling day.

Intercept Survey Measures

During intercept surveying, trained interviewers approached every adult state park visitor (age > 18) at the selected venues and asked if he/she would be willing to participate in a brief survey about state park use. Surveys were available in English and Spanish, and survey administrators were fluent in both languages. Upon consent, every fifth visitor was given a questionnaire focused on physical activity. The participation rate was 91.5%. Demographics of intercept survey respondents are presented in Table 1.

Table 1

Demographic and Socioeconomic Characteristics of Adults Sampled (% of Total) in Georgia State Parks, 2010

	Intercept Surveys[a]		SOPARC Observations[a]		
Demographic Variables	**Day Users** (n = 826)	**Overnight Users** (n = 247)	**Lakefront** (n = 8462)	**Trail/ Multi-use** (n = 610)	**Total GA Population[b]**
Gender					
Female	57.3	48.2	56.8	46.4	51.2
Male	39.1	49.4	43.2	53.6	48.8
Did not report	3.6	2.4			
Age					
≤ 30 years old	28.3	18.6	95.3	63.4	75.3
31-59 years old	59.1	61.5	*(Adults 18-59)*	*(Adults 18-59)*	*(age 18*
≥ 60 years old	4.7	13.4	4.7	36.6	*or older)*
Did not report	7.9	6.5	*(Adults 60+)*	*(Adults 60+)*	
Mean Age	*36.8*	*43.1*			
Race/Ethnicity					
White/Caucasian	52.2	88.3	49.1	83.0	55.9
Hispanic/Latino	32.0	5.3	39.7	5.8	8.8
Black/Afr. Amer.	7.5	1.2	7.5	5.2	30.5
Asian/Other	6.3	3.2	3.7	6.1	4.8
Did not report	2.1	2.0			
Household Income					
$25,000 or less	19.4	4.9	N/A[c]	N/A[c]	15.7
$25,001-50,000	25.8	18.2			*(below*
$50,001 or more	34.5	49.4			*poverty line)*
Refused	20.2	18.6			
Did not report	9.1	8.9			
Education					
No college degree	50.4	29.6	N/A[c]	N/A[c]	16.5
College degree	43.3	65.2			56.3
Did not report	6.3	5.3			27.2

[a] Proportions reflect pooled sample of visitors to three state parks within the specified use category.
[b] Overall Georgia state population estimates based on 2010 U.S. Census Data (U.S. Census Bureau, 2012)
[c] Education and income data were not collected during SOPARC observations.

Survey items addressed park visitation, physical activity levels, locations, and preferences, and demographics (gender, age, race/ethnicity, education, and income). Specifically, participants were asked to report their number of park visits in the past year, their time spent in the park during their current visit (both overall and physically active time), and the park areas they used for physical activities during their current visit (e.g., swimming areas, playgrounds, hiking trails). Park-based physical activity questions were adapted from existing instruments (e.g., Walker et al., 2009) and distinguished between moderate and vigorous activity, reflecting terminology used in lifestyle surveys such as the Behavioral Risk Factor Surveillance System (CDC, 2009). To approximate overall self-reported physical activity levels (both inside and outside of parks), participants were asked to estimate how many days in a typical week they engaged in 30 or more minutes of physical activity. This metric was based on recommended activity levels for adults (30 or more minutes of moderate or vigorous activity on five or more days per week) provided by the Georgia Department of Public Health (GADPH) and the Centers for Disease Control and Prevention (CDC, 2010). Intercept survey respondents were also asked to rate the importance of specific site characteristics, features, and facilities for promoting their onsite physical activity (i.e., physical activity site preferences) on a Likert-type scale from 1 = *not at all important* to 5 = *extremely important.*

Behavioral Observation Measures

Observations of adult state park visitor activity at lakefront (beaches and adjacent picnic areas) and trail/multiuse zones (trailheads and neighboring courts and fields) were conducted using a modified version of the System for Observing Play and Recreation in Communities (SOPARC), a recently developed strategy for assessing physical activity in community settings (Floyd et al., 2008; McKenzie et al., 2006). A stratified random sampling protocol was used to maximize coverage across four sampling periods (6:00–11:59 a.m., 12:00–2:59 p.m., 3:00–5:59 p.m., and 6:00–11:59 p.m.) during each sample day. Scans were evenly distributed across each sampling period (47–59 scans were conducted during each of the four sessions), with an average of 4.7 scans occurring at each park during a sampling day. The focus on lakefront and trail/multiuse zones accounted for a majority of day use visitor activity at each park. Following the adapted SOPARC protocol, a trained observer began each scan at one end of a target area and slowly walked across the zone, documenting the apparent age (12 and younger, 13 to 17, 18 to 59, or 60 and older), gender (male or female), race/ethnicity (White, African American, Latino, or Asian/Other), and activity levels (sedentary, moderate, or vigorous) of recreation participants at the moment they were observed (Table 1). Because the same individuals could have been counted multiple times on subsequent scans, the SOPARC sample may not represent the number of unique visitors to each hotspot or the overall proportions of park users. The validity of race/ethnicity codes was confirmed by matching observations with survey responses, resulting in a 98.7% accuracy rate across observers. Validity of the physical activity codes has been established in previous studies (Scruggs et al., 2003). High levels of inter-rater reliability (intra-class correlation coefficients among paired observers > 0.942) indicated acceptable agreement among observers for all demographic categorizations (Whiting et al., 2012).

Data Analysis

Data were analyzed during using SPSS Statistics Version 19.0. In many of the physical activity analyses, moderate and vigorous activity levels were combined to form a general moderate-plus-vigorous activity (MVPA) category. Ordinary least squares (OLS) regression was used to examine the influence of multiple factors on total self-reported MVPA time during day use and

overnight state park visits. To minimize the effects of outliers and potentially erroneous self-reported data, only cases with Cook's D < 1.0 and total MVPA < 8 hours were included in the OLS regression analysis. Reported MVPAs greater than 8 hours were considered to be erroneous outliers. Among day users (< 20 hours in the park) these filters excluded 0.6% of participants and resulted in an effective sample of 795 park visitors. Among overnight visitors (> 20 hours in the park) these filters excluded 6.3% of participants and resulted in an effective sample of 224 park visitors. Demographic differences in self-reported use of various state park activity locations (e.g., swimming areas, picnic areas, trials, open green space) were examined using Pearson's chi-square tests.

Separate logistic regression models were developed to examine the effects of temporal and demographic variables on observed physical activity levels (obtained via SOPARC) of visitors using the lakefront and trail/multi-use zones. For analytical purposes, physical activity levels were grouped into a binary outcome variable where 0 = *sedentary,* and 1 = *moderately or vigorously active* at the time of observation. Additional independent logistic regression models were used to evaluate the relationships between various demographic variables (gender, age, race/ethnicity, and income) and park-based physical activity site preferences. For analytical purposes, importance ratings were grouped into a binary outcome variables where 0 = *not important* (score of 1–3 on the Likert-type scale) and 1 = *important* (scores of 4–5 on the Likert-type scale). An absence of multicollinearity among predictor variables in all regression analyses (VIF < 10.0, $r <$ 0.5) was confirmed before models were tested. Because data for certain questions and items were missing on some surveys, the sample size for each estimated model varied slightly.

Results

Park-Based Physical Activity: Intercept Surveys

Day visitors sampled across all parks engaged in MVPA for an average of 1.96 ± 0.13 hours (moderate M = 1.43 ± 0.09 hours, vigorous M = 0.54 ± 0.06 hours). About 14% of the participants reported no physical activity during their day trip to the park; 65.8% engaged in at least one hour of moderate activity, and 41.2% participated in at least 30 minutes of vigorous activity. About 10% of day visitors participated in five or more hours of physical activity at any level. Statistically significant predictors of MVPA during day use state park visits (Table 2) included total time in park, self-reported weekly activity levels (regularly active individuals were more active during park visits), site visitation frequency (frequent visitors were most active), and age. For every one year increase in age, mean MVPA during day use visits decreased by 0.02 hour. Day users at income levels above $50,000/year tended to be less active than those with incomes below $25,000/year; however, there was no statistical difference between the low income group and either the $25,000–50,000/year or the income refusal responses. Racial/ethnic differences in mean park-based MVPA were not evident. Park sites significantly associated with the physical activity of day users included swimming areas, boating areas, and open green space, with use of open green space and swimming areas having the most pronounced effects on day visitors' mean MVPA.

Overnight visitors sampled across all parks engaged in MVPA for an average 2.46 ± 0.25 hours (moderate M = 1.96 ± 0.21 hours, vigorous M = 0.50 ± 0.10 hours). About 6% of the participants reported no physical activity during their overnight trip to the park; 75.9% engaged in at least one hour of moderate activity and 45.8% participated in at least 30 minutes of vigorous activity. About 13% of overnight visitors participated in five or more hours of physical activity at

Table 2

OLS Regression Estimates for Factors Associated with Day Use and Overnight Visitors' Reported Moderate and Vigorous Physical Activity Level (Total Hours of MVPA) in Georgia State Parks (2010)

	Day Use Visitors[a]		Overnight Visitors[b]	
Variable	**B** (SE)	**Mean**	**B** (SE)	**Mean**
Constant	0.453		-0.549	
	(0.505)		(4.676)	
Total Time in Park (hrs.)	0.249 ***	5.12	-0.016	23.87
	(0.027)		(0.191)	
Overall Phys. Act. (days/week)	0.129 ***	3.48	0.119 *	3.57
	(0.031)		(0.071)	
Visitation Frequency[c]	0.025 ***	4.55	0.024	2.42
	(0.010)		(0.024)	
Gender (Male)	0.083 *	0.39	0.288	0.56
	(0.125)		(0.255)	
Age	-0.019 ***	37.14	-0.018 *	43.48
	(0.005)		(0.010)	
Race (Latino)[d]	-0.061	0.30	1.039 *	0.06
	(0.152)		(0.554)	
Race (Black)[d]	-0.022	0.07	-1.557	0.02
	(0.242)		(1.033)	
Race (Asian/Other)[d]	0.084	0.06	2.221 **	0.02
	(0.269)		(0.923)	
Income ($25-50K)[e]	-0.083	0.26	-0.266	0.19
	(0.185)		(0.690)	
Income (more than $50K)[e]	-0.331 *	0.35	-0.143	0.58
	(0.180)		(0.646)	
Income (Refused)[e]	-0.150	0.19	-0.349	0.18
	(0.198)		(0.697)	
PA Site – Biking Trails[f]	0.288	0.12	0.204	0.24
	(0.202)		(0.306)	
PA Site – Boating Areas[f]	0.287 *	0.24	0.466 *	0.37
	(0.148)		(0.267)	
PA Site – Hiking Trails[f]	0.054	0.27	0.810 ***	0.67
	(0.147)		(0.280)	
PA Site – Open Green Space[f]	0.412 **	0.14	0.315	0.19
	(0.184)		(0.339)	
PA Site – Picnic Areas/Playgrounds[f]	0.114	0.66	0.190	0.48
	(0.132)		(0.276)	
PA Site – Swimming Areas[f]	0.351 **	0.76	0.384	0.65
	(0.145)		(0.291)	

*,**,*** denote significance at $\alpha = 0.10$, 0.05, and 0.01, respectively
[a] Mean Day Use MVPA = 1.97 ± 0.13 hours; Model Fit Statistics: $F(17,645) = 11.67$, $p < 0.001$, $R^2 = 0.22$
[b] Mean Overnight MVPA = 2.37 ± 0.26 hours; Model Fit Statistics: $F(17,178) = 3.03$, $p < 0.001$, $R^2 = 0.15$
[c] State park visitation frequency = number of trips to focal park in past 12 months
[d] White served as the reference category
[e] Low income (<$25K per year) served as the reference category
[f] Physical activity site use scores are binary variables where 0 = did not use and 1 = used

any level. Statistically significant predictors of MVPA during overnight state park visits differed from those of day use visits (Table 2). Overall, weekly self-reported activity levels were positively related to park-based MVPA of overnight users, but this relationship was only marginally significant. Asian and Latino overnight visitors (about 8% of the total sample) were generally more active than white visitors. On average, Asians spent about two hours more time engaged in MVPA than white visitors. Use of hiking trails was significantly associated with the physical activity of overnight visitors, while use of boating areas was marginally significant.

Combined self-reported data for day and overnight visitors to all three state parks revealed significant associations between demographic groups and use of particular areas within the parks. Swimming areas (used by 72.5% of visitors) and picnic areas and playgrounds (62.1%) were the sites most commonly used for physical activity across all demographic groups, followed by dirt or gravel hiking trails (37.4%), boating areas (26.6%), paved walking trails (21.4%), open green space (15.7%), and biking trails (14.7%). Pearson chi-square tests examining demographic differences in site usage showed that males were more frequent users of open green space, $\chi^2(1,982) = 6.0$, $p = 0.014$, and bike trails, $\chi^2(1,982) = 3.7$, $p = 0.054$. Females, however, were more active in picnic areas and playgrounds, $\chi^2(1,987) = 8.7$, $p = 0.003$. Swimming areas were used more often by younger visitors (ages 18-30) than those from other age groups, $\chi^2(2,992) = 3.6$, $p = 0.033$. Picnic areas and playgrounds were more popular among Asian and Latino visitors, $\chi^2(3,963) = 6.5$, $p = 0.088$, whereas white visitors used dirt or gravel hiking trails more often than other groups, $\chi^2(3,960) = 41.1$, $p < 0.001$. African Americans favored paved hiking trails more than other racial/ethnic groups, $\chi^2(3,663) = 9.5$, $p = 0.024$. Open green space was a more popular physical activity location for Latinos (21.3% used open green space for physical activity) compared to other groups, $\chi^2(3,958) = 8.2$, $p = 0.043$. When considering the income level of respondents, high income visitors favored hiking trails, $\chi^2(5,971) = 13.1$, $p = 0.023$, and bike trails, $\chi^2(5,969) = 10.9$, $p = 0.054$, more than other income groups; middle and lower income visitors frequented swimming areas more than their higher income counterparts, $\chi^2(5,975) = 26.3$, $p < 0.001$.

Park-Based Physical Activity: Observations

The SOPARC observations provided another form of evidence pertaining to state park visitors' activity levels. Overall, 58.4% of observed adults in both the lakefront and trail/multi-use zones were sedentary, 38.8% were moderately active, and 2.7% were vigorously active at the time of observation. Although most visitors (84.7%) were observed in lakefront zones, the overall proportion of visitors observed engaged in physical activity was lowest in the lakefront zones (32.0% moderately active, 0.5% vigorously active) and highest in trail/multi-use zones (76.4% moderately active, 15.2% vigorously active). The ethnic ratio of overall visitors observed at each location was also significantly different: in lakefront zones 49.1% of visitors were white; in trail/multi-use zones, 83.0% of visitors were white (Table 1).

In lakefront zones, the logistic model predicting the discrete activity level (i.e., active or inactive) revealed significant effects for park, weekends, time of the day, gender, and race/ethnicity (Table 3). For lakefront zone observations, observed participants were 73% and 68% as likely to be active at Fort Mountain and Fort Yargo, respectively, than at Red Top Mountain. People observed in the same areas on weekends/holidays were 122% as likely to be active as those observed on weekdays. Visitors observed in the morning, early afternoon, late afternoon were less likely to be active than visitors observed in the evening. Males were 133% as likely to be active as females. Asian or Latino ethnicity did not significantly affect the probability that an observed individual was active. However, African American visitors were 131% as likely to be active as white visitors when observed in a lakefront zone at one of the three parks. Age was inversely related to activity, but this relationship was only marginally significant.

Across all parks, the most frequently observed activities in lakefront zones were walking (17.9% of all visitors) and swimming (9.7%). Walking was most commonly observed among African American visitors (27.9%). Swimming (11.7%) and sports such as volleyball and soccer (4.1%) were more popular among Latinos.

In trail/multi-use zones, the logistic model predicting activity level revealed significant effects for park, time of the day, gender, and race/ethnicity (Table 3). Observed participants were 49% and 41% as likely to be active at Fort Mountain and Fort Yargo, respectively, than at Red Top Mountain. Morning visitors were almost four times more likely to be active than evening visitors. Males were 158% as likely to be active as females. Neither age nor day of the week significantly affected the probability that an observation was active, nor did Asian ethnicity. African American and Latino visitors were significantly less likely to be active than whites visitors (24 and 36%, respectively) when observed in a trail/multi-use zone at one of the three parks.

Across all parks, the most frequently observed activities at trail/multi-use zones were hiking (58.7%), mountain biking (14.7%), and walking (7.0%). Hiking was more commonly observed in Asian (69.3%) and White (63.0%) visitors than African Americans (23.8%) and Latinos (17.3%). African Americans participated in basketball (27.4%) and walking (15.5%) at a higher rate than other racial/ethnic groups in the trail/multi-use zones. Soccer was especially popular among Latinos (28.0%).

Table 3

Logistic Regression Estimates for Factors Associated with Observed Moderate/Vigorous Activity in Lakefront and Trail/Multi-Use Zones of Georgia State Parks (2010)

	Lakefront Zones[a]				Trail/Multi-use Zones[b]			
Variable	**B** (SE)		**OR**	**Mean**	**B** (SE)		**OR**	**Mean**
Constant	-0.602	***			2.594	***		
	(0.090)				(0.373)			
Park (Fort Mountain)[c]	-0.319	***	0.73	0.186	-0.704	**	0.49	0.387
	(0.071)				(0.336)			
Park (Fort Yargo)[c]	-0.389	***	0.68	0.430	-0.901	***	0.41	0.340
	(0.056)				(0.338)			
Day (Weekend/Holiday)[d]	0.200	***	1.22	0.757	0.030		1.03	0.693
	(0.063)				(0.255)			
Session (Morning)[e]	-0.200	**	0.82	0.115	1.366	***	3.92	0.267
	(0.093)				(0.397)			
Session (Early Afternoon)[e]	-0.497	***	0.61	0.312	0.406		1.50	0.363
	(0.074)				(0.310)			
Session (Late Afternoon)[e]	-0.163	**	0.85	0.405	0.464		1.59	0.203
	(0.069)				(0.332)			
Gender (Male)	0.288	***	1.33	0.432	0.457	**	1.58	0.563
	(0.049)				(0.203)			
Age (Senior)	-0.221	*	0.80	0.047	-0.451		0.64	0.124
	(0.121)				(0.304)			
Ethnicity (Black)[f]	0.267	***	1.31	0.075	-1.425	***	0.24	0.058
	(0.095)				(0.312)			
Ethnicity (Latino)[f]	0.085		1.09	0.397	-1.019	***	0.36	0.052
	(0.054)				(0.332)			
Ethnicity (Asian/Other)[f]	-0.004		1.00	0.037	-0.110		0.90	0.061
	(0.131)				(0.449)			

*,**,*** denote significance at $\alpha = 0.10, 0.05$, and 0.01, respectively

[a] % Active = 32.5%; n = 8002; Model Fit Statistics: $\chi^2(df=11) = 209.38$, $p < 0.001$, Hosmer & Lemeshow $\chi^2(df=8) = 13.60$, $p = 0.093$, Nagelkerke $R^2 = 0.04$

[b] % Active = 91.6%; n = 1451; Model Fit Statistics: $\chi^2(df=11) = 86.69$, $p < 0.001$, Hosmer & Lemeshow $\chi^2(df=8) = 11.70$, $p = 0.165$, Nagelkerke $R^2 = 0.13$

[c] Red Top Mountain State Park served as the reference category

[d] Weekdays served as the reference category

[e] The evening observation session served as the reference category

[f] White served as the reference category

Physical Activity Preferences: Intercept Surveys

Among all demographic groups and sites, the most important features for encouraging park-based activity were a safe environment ($M = 4.63 \pm 0.05$), being with active friends and family ($M = 4.20 \pm 0.06$), and natural scenery ($M = 4.10 \pm 0.06$). Logistic regression models examining the discrete importance rating (0 = *not important*, or Likert score or 1–3; 1 = *important,* or Likert score of 4–5) for each variable revealed significant demographic differences in physical activity site preferences (Table 4).

A safe environment appeared to be uniformly important across all demographic groups with the exception of gender. Females valued safety more than males, with males 56% as likely as females to rate a safe park environment as important. Certain demographic variables were also associated with stronger preferences for specific physical activity-related site attributes. For instance, the perceived importance of natural scenery increased as age increased. Developed areas and facilities were also more important to older visitors and racial/ethnic minorities, particularly Latinos, who were 153% as likely as white visitors to rate developed areas and facilities as important. Developed areas were less important to state park visitors in the higher income categories. Another park feature, open green space, appeared to be especially important to the physical activity of racial/ethnic minority groups. Compared to white visitors, African Americans, Latinos, and Asians were between 192 and 346% as likely to rate open green space as important. High income visitors valued these areas less than lower income visitors. Access to a diverse array of recreation opportunities was important to many visitors as well. Latinos and low income visitors were more likely to rate having a variety of activity choices as important. Similarly, Latinos rated accessible recreation opportunities as important more often than visitors in other racial/ethnic groups. Access to recreation opportunities was also more important to Asians and older park visitors.

Socially oriented physical activity preferences varied significantly among the different demographic groups, and were generally favored by individuals in the racial/ethnic minority and low income groups. For example, being active with friends and family appeared to be especially important to females, Asians and Latinos, and visitors in the lowest income category. Similarly, seeing other active visitors was more important to individuals in all three racial/ethnic minority groups. Latinos, African Americans, and Asians were between 284% and 299% as likely to value seeing other physically-active active visitors than white respondents. The presence of other active visitors was also significantly more important to older visitors and respondents with lower levels of income and education.

Discussion

Despite growing recognition of public parks' contribution to active lifestyles (Godbey & Mowen, 2010; Mowen et al., 2008), few studies have examined levels of park-based physical activity in the southeastern United States (Floyd et al., 2008; Shores & West, 2010). Even fewer have explored the influence of rural or exurban parks on physical activity behavior and preferences among low income and racial/ethnic minority groups (Floyd et al., 2009; Taylor, Floyd, Whit-Glover, & Brooks, 2007). Results of this study yielded new information about the potential role that state parks could play in promoting physical activity across diverse population sectors and helped to identify park characteristics, features, and facilities associated with increased levels of MVPA.

Table 4

Logistic Regression Estimates for Factors Associated with Visitors' Physical Activity Site Preference Ratings in Georgia State Parks (2010)

	Items/Attribute Rankings							
	1. A Safe Environment[a]		**2. Being Active with Friends/Family**[b]		**3. Natural Scenery**[c]		**4. Variety of Activity Choices**[d]	
Importance Ratings	(91.6% important)		(80.4% important)		(78.4% important)		(64.8% important)	
Predictor Variables	**B** (SE)	**OR**	**B** (SE)	**OR**	**B** (SE)	**OR**	**B** (SE)	**OR**
Constant	2.054 ***		2.352 ***		-0.175		0.700 **	
	(0.547)		(0.432)		(0.349)		(0.322)	
Gender (Male)	-0.575 **	0.56	-0.412 **	0.66	0.005	1.01	-0.022	0.98
	(0.253)		(0.178)		(0.172)		(0.149)	
Age	0.020 *	1.02	-0.002	1.00	0.034 ***	1.04	0.006	1.01
	(0.011)		(0.007)		(0.007)		(0.006)	
Ethnic (White = Ref.)								
Ethnic (Black)	-0.040	0.96	0.497	1.64	-0.504	0.60	0.504	1.66
	(0.500)		(0.402)		(0.327)		(0.328)	
Ethnic (Latino)	0.507	1.66	0.442 *	1.56	0.272	1.31	0.546 ***	1.73
	(0.355)		(0.254)		(0.216)		(0.199)	
Ethnic (Asian/Other)	0.961	2.61	1.844 **	6.32	0.110	1.18	0.186	1.21
	(0.749)		(0.735)		(0.399)		(0.335)	
Income (<$25K = Ref.)								
Income ($25-50K)	0.084	1.09	-0.763 **	0.47	0.014	1.01	-0.345	0.71
	(0.450)		(0.357)		(0.268)		(0.259)	
Income (>$50)	-0.041	0.96	-0.804 **	0.45	0.170	1.19	-0.616 **	0.54
	(0.433)		(0.353)		(0.269)		(0.254)	
Income (Refused)	-0.441	0.64	-0.749 **	0.47	-0.030	0.97	-0.595 **	0.55
	(0.446)		(0.377)		(0.283)		(0.273)	
Education (some college)	-0.337	0.71	-0.264	0.77	0.139	1.15	0.017	1.02
	(0.283)		(0.198)		(0.186)		(0.163)	

*,**,*** denote significance at $\alpha = 0.10, 0.05$, and 0.01, respectively

[a] n = 856; Model Fit Statistics: $\chi^2(df=9) = 13.73$, $p = 0.132$, Hosmer & Lemeshow $\chi^2(df=8) = 17.00$, $p = 0.030$, Nagelkerke $R^2 = 0.04$

[b] n = 851; Model Fit Statistics: $\chi^2(df=9) = 33.93$, $p < 0.001$, Hosmer & Lemeshow $\chi^2(df=8) = 13.71$, $p = 0.090$, Nagelkerke $R^2 = 0.06$

[c] n = 866; Model Fit Statistics: $\chi^2(df=9) = 31.27$, $p < 0.001$, Hosmer & Lemeshow $\chi^2(df=8) = 4.65$, $p = 0.795$, Nagelkerke $R^2 = 0.06$

[d] n = 841; Model Fit Statistics: $\chi^2(df=9) = 21.41$, $p = 0.011$, Hosmer & Lemeshow $\chi^2(df=8) = 40.66$, $p = 0.794$, Nagelkerke $R^2 = 0.04$

Table 4 (cont.)

	Items/Attribute Rankings							
	5. Accessible Rec Opportunities[e]		**6. Open Green Space**[f]		**7. Developed Areas/Facilities**[g]		**8. Seeing Other Active Visitors**[h]	
Importance Ratings	(64.1% important)		(61.7% important)		(59.6% important)		(38.4% important)	
Predictor Variables	**B** (SE)	**OR**	**B** (SE)	**OR**	**B** (SE)	**OR**	**B** (SE)	**OR**
Constant	0.317		0.840 ***		-0.142		-0.880 ***	
	(0.319)		(0.320)		(0.308)		(0.317)	
Gender (Male)	-0.222	0.80	-0.241	0.79	-0.091	0.91	-0.166	0.85
	(0.150)		(0.148)		(0.145)		(0.153)	
Age	0.010 *	1.01	-0.002	1.00	0.022 ***	1.02	0.020 ***	1.02
	(0.006)		(0.006)		(0.006)		(0.006)	
Ethnic (White = Ref.)								
Ethnic (Black)	0.251	1.29	0.654 **	1.92	0.362	1.44	1.047 ***	2.85
	(0.310)		(0.315)		(0.305)		(0.303)	
Ethnic (Latino)	0.893 ***	2.44	0.930 ***	2.53	0.422 **	1.53	1.097 ***	2.99
	(0.208)		(0.202)		(0.189)		(0.192)	
Ethnic (Asian/Other)	0.571 *	1.77	1.240 ***	3.46	0.252	1.29	1.042 ***	2.84
	(0.345)		(0.387)		(0.327)		(0.327)	
Income (<$25K = Ref.)								
Income ($25-50K)	-0.212	0.81	-0.369	0.69	-0.306	0.74	-0.457 *	0.63
	(0.253)		(0.256)		(0.242)		(0.241)	
Income (>$50)	-0.220	0.80	-0.456 *	0.63	-0.644 ***	0.53	-0.571 **	0.57
	(0.249)		(0.252)		(0.238)		(0.239)	
Income (Refused)	-0.226	0.80	-0.451 *	0.64	-0.151	0.86	-0.441 *	0.64
	(0.270)		(0.273)		(0.261)		(0.258)	
Education (some college)	-0.140	0.87	-0.191	0.83	-0.089	0.92	-0.573 ***	0.56
	(0.163)		(0.161)		(0.158)		(0.165)	

*,**,*** denote significance at $\alpha = 0.10, 0.05$, and 0.01, respectively

[e] n = 832; Model Fit Statistics: $\chi^2(df=9) = 30.12$, $p < 0.001$, Hosmer & Lemeshow $\chi^2(df=8) = 8.23$, $p = 0.411$, Nagelkerke $R^2 = 0.05$

[f] n = 858; Model Fit Statistics: $\chi^2(df=9) = 55.72$, $p < 0.001$, Hosmer & Lemeshow $\chi^2(df=8) = 7.22$, $p = 0.513$, Nagelkerke $R^2 = 0.09$

[g] n = 846; Model Fit Statistics: $\chi^2(df=9) = 30.25$, $p < 0.001$, Hosmer & Lemeshow $\chi^2(df=8) = 2.82$, $p = 0.945$, Nagelkerke $R^2 = 0.05$

[h] n = 842; Model Fit Statistics: $\chi^2(df=9) = 85.28$, $p < 0.001$, Hosmer & Lemeshow $\chi^2(df=8) = 7.17$, $p = 0.519$, Nagelkerke $R^2 = 0.13$

Actual levels of self-reported, state park-based physical activity were generally high. About 85% of visitors reported at least some amount of moderate or vigorous activity during their park visits. Over 65% of day and overnight users stated that they had participated in at least one hour of MVPA during their visit. Across all parks, day visitors were moderately active for an average of 86 minutes and vigorously active for 32 minutes per trip; overnight visitors were moderately active for an average of 118 minutes and vigorously active for 30 minutes per day. These park-based activity levels are higher than those documented in a recent study of Pennsylvania state park users, which showed 63% of visitors engaged in at least some activity with an average of approximately 58 minutes of MVPA per person per visit (Mowen et al., 2012). Furthermore, the MVPA data from Georgia state parks exceed adults' recommended levels of daily physical activity (CDC, 2010a). Overall, these numbers suggest that efforts to recruit new visitors to state parks and encourage existing park users to visit more frequently could increase physical activity levels and improve fitness and physical health across diverse populations.

As expected, overall self-reported weekly physical activity levels were among the best predictors of park-based MVPA for both day and overnight visitors. Activity levels during day use visits were also related to visitation frequency, with higher reported activity levels for more frequent visitors. Both relationships indicate that an inherent affinity for active outdoor recreation translates into higher levels of park-based physical activity. However, individual factors such as previous park visitation and overall physical activity levels were not the only variables associated with park-based MVPA. Environmental and sociodemographic correlates of activity were also present, providing additional support for comprehensive socioecological models of park-based physical activity promotion that transcend intra-personal factors (Shores & West, 2008a; Spence & Lee, 2003).

Certain park features and facilities were associated with higher levels of physical activity. This study supports previous research findings on site use patterns that show activity levels are typically high in areas around sports fields and courts, play structures, and walking paths (Kaczynski et al., 2008; Rung, Mowen, Broyles, & Gustat, 2010; Rung et al., 2011; Shores & West, 2008a). Use of open green space was a significant predictor of total MVPA during day visits and use of hiking trails was significantly associated with the MVPA levels of overnight visitors. Observational data helped to validate many of these patterns. The percentage of physically active visitors observed at trail/multi-use zones was significantly higher than the percentage observed at lakefront zones (i.e., beaches and picnic areas). However, results also indicated that fewer state park visitors were using these more physically active zones. Managers hoping to increase park-based physical activity should therefore consider strategies that simultaneously increase activity levels in the most heavily visited state park zones (i.e., lakefronts) and attract more visitors to zones where activity levels already tend to be higher (i.e., trail/multiuse areas). Data pertaining to physical activity preferences could help managers achieve these goals.

Results also revealed the importance of non-traditional locations for state park-based physical activity. The locations appear to represent an important supplement to park zones commonly associated with MVPA, especially for racial/ethnic minorities. For example, in this study, swimming and picnic areas were among the most frequently used locations for physical activity, contradicting research suggesting that park-based activity levels tend to be lower around picnic shelters and other social gathering zones (Floyd et al., 2008; Mowen, 2010). Because picnic and swimming areas represent a hub for family activities, their use as a destination for physical activity underscores the important influence of social context on visitor behavior (Brownson, Baker, Housemann, Brennan, & Bacak, 2001; Giles-Corti & Donovan, 2003; Sallis, Hovell,

& Hofstetter, 1992; Trost, Owen, Bauman, Sallis, & Brown, 2002). These relationships were supported by visitor ratings on the socially oriented physical activity preference items. Other studies have noted a strong association between social support and general leisure time physical activity for a variety of demographic groups, including older adults and Latinos (Orsega-Smith, Payne, Mowen, Ho, & Godbey, 2007; Skowron, Stodolska, & Shinew, 2008). Stealthy park design could capitalize on the relationship between social interactions and physical activity, integrating physical fitness opportunities and seemingly incongruous sedentary activities (Buchner & Gobster, 2007). Some researchers have already noted the potential health benefits of social activities within parks, recommending the placement of picnic areas near attractive physical activity sites (e.g., playgrounds, easy family-friendly hiking trails) to increase the likelihood that adults and children gathering for social purposes also participate in active recreation (Shores & West, 2010; Stodolska et al., 2010). In fact, Georgia state park visitors rated "being active with family and friends" as one of their most important physical preferences. Other studies examining situational involvement ratings in a recreation and leisure context report similar findings, revealing high levels of physical activity enjoyment during episodes that included co-participation with relatives and peers (Decloe et al., 2009).

Results of this study suggest that socially oriented physical activity may be especially important to low-income racial/ethnic minority state park visitors, reflecting observed patterns in other parks (Chavez & Olson, 2008; Stodolska et al., 2010). For example, Latinos and African Americans reported proportionately greater use of picnic areas, beaches, and playgrounds than other groups. Observed activity levels for African Americans and Latinos were highest in the heavily used lakefront zones and lowest in the trail/multiuse zones. To reiterate, across all three parks, the ratio of racial/ethnic minorities observed in the trail/multiuse zones relative to whites (approximately 17%) was significantly lower than the ratio of racial/ethnic minority visitors observed in the lakefront zones (approximately 50.9%). Latino and African American visitors, in particular, also expressed a stronger preference for "developed areas and facilities," supporting previous research on park use in urban areas (Gobster, 2002; Payne, Mowen, & Orsega-Smith, 2002). Low-income and racial/ethnic minorities were also significantly more likely than high-income or white visitors to rate "seeing or being around other active state park visitors" as an important physical activity preference. Research has shown social support networks are especially prominent in Latino park visitor groups (Chavez, 2008; Marquez & McAuley, 2006; Stodolska et al., 2010), and efforts to encourage physical activity among chronically inactive Latino populations would likely benefit from a stronger focus on family-based activities.

Across all groups, and particularly among women, the most important factor for promoting physical activity was a safe recreation environment. Safety has been recognized as the primary concern for visitors in parks around the U.S. (Humpel, Owen, & Leslie, 2002; McCormack, Rock, Toohey, & Hignell, 2010; Mowen, Payne, & Scott, 2005; Wilhelm-Stanis, Schneider, Chavez, & Shinew, 2009) and should therefore remain a high priority for park managers attempting to encourage physical activity at their respective sites. Future studies could explore specific aspects of parks that may enhance perceptions of safety (e.g., visible presence of park rangers, lifeguards, first aid stations, well-maintained facilities) and affect visitor behavior. Overall, differences in state park user group preferences combined with substantial variation in condition of and access to desired park attributes and amenities highlight the need for more research examining links between park-based physical activity demand and opportunity. Additional studies involving strategies such as importance-performance analyses of MVPA-related factors could help managers prioritize and plan for satisfying, physically active experiences at their sites (Abalo, Varela, & Manzano, 2007).

Conclusion

This investigation capitalized on strengths including a mixed-methods research design, an emphasis on understudied parks (state parks) in a new geographical context (the southern United States), data collection involving multiple types of potential physical activity sites within parks, and a large sample of racial/ethnically diverse participants to provide new insight into the potential role of Georgia state parks as a physical activity destination. Self-reported and observed park use patterns and preferences revealed many similarities between park-based physical activity in Georgia state parks and data collected by other researchers at smaller parks in more urban areas. However, state parks appeared to support higher levels of physical activity among low-income, racial/ethnic minority populations than previously recognized. When considering park-based activity across visitor groups, a greater emphasis could be placed on unconventional activity locations such as picnic areas and beaches. These areas attract nontraditional visitors and create opportunities for social recreation experiences, which encourage physical activity participation in Latinos and other racial/ethnic minority groups. Given the important influence of socio-ecological factors on park-based physical activity, researchers should continue to explore the interacting effects of visitor diversity, park features, and public perceptions of park features on activity levels in different types of park settings (McCormack et al., 2010; Nasar, 2008; Rung et al., 2011; Shores & West, 2008b).

Future research could address some limitations of this study. First and foremost, the sample was deliberatively chosen to represent Georgia state park users (the representative nature of the parks was a primary selection criterion). As the data in Table 1 indicate, certain segments of the sample population (e.g., day users in lakefront zones) reflect the general population of Georgia, while others do not (e.g., campers and trail users). Although these discrepancies are primarily due to demographic differences in park visitation and site use preferences, future studies could expand the current sample frame to facilitate inferences across a broader population of potential park users. The delimitation of this sample to the peak summer season presents other research opportunities, for park-based physical activity patterns may differ at other times of the year. For example, park visitation and subsequent activity is substantially lower on weekdays in the winter. Overt measures of physical activity behavior that move beyond self-reported measures could also improve the validity of activity data, helping researchers avoid potential errors and estimation bias, and develop a more objective understanding of actual activity patterns that considers frequency, duration, and intensity (Kruger et al., 2007; Sallis & Saelens, 2000). The moment-in-time sampling approach (SOPARC) used in this study provided a snapshot of visitor activity, but techniques incorporating accelerometers or mobile data loggers across entire park visits would yield more detailed information about physical activity time budgets.

The overall physical activity benefits that parks provide to individuals undoubtedly depend on access-related factors such as the proximity of parks to the home, viable transportation options, and access fees (Wilhelm-Stanis, Schneider, & Anderson, 2009). Future studies evaluating the relative contributions of parks to physical activity should therefore consider these variables and directly compare visitation rates and activity levels across local, state, and national parks as well other potential physical activity locations (e.g., homes, neighborhoods, gyms, work) (Huston, Evenson, Bors, & Gizlice, 2003; Larson, Whiting, Green, & Bowker, 2014; Wilhelm-Stanis, Schneider, Shinew, Chavez, & Vogel, 2008). Models attempting to quantify the influence of diverse social, environmental, and behavioral factors on activity levels could be adapted to explicitly account for constraints to physical activity participation (Wilhelm-Stanis, Schneider et

al., 2009). The scope of this investigation could also be expanded to move beyond adults and explore the sociodemographic and environmental characteristics that influence park-based physical activity of youth in both metropolitan and non-metropolitan areas. Finally, it is important to acknowledge that physical activity represents just one of many health-related benefits parks provide to individuals and communities (Smith, Anderson, Davenport, & Leahy, 2013). Future research could therefore explore the broader contributions of park visits to the health and well-being of demographically diverse populations.

References

Abalo, J., Varela, J., & Manzano, V. (2007). Importance values for Importance-Performance Analysis: A formula for spreading out values derived from preference rankings. *Journal of Business Research, 60*, 115–121. doi: 10.1016/j.jbusres.2006.10.009

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179–211.

Bedimo-Rung, A. L., Gustat, J., Tompkins, B. J., Rice, J., & Thomson, J. (2006). Development of a direct observation instrument to measure environmental characteristics of parks for physical activity. *Journal of Physical Activity and Health, 3*(Supplement), 176–189.

Bedimo-Rung, A. L., Mowen, A. J., & Cohen, D. A. (2005). The significance of parks to physical activity and public health: A conceptual model. *American Journal of Preventive Medicine, 28*(2, Supplement 2), 159–168.

Boone-Heinonen, J., Casanova, K., Richardson, A. S., & Gordon-Larsen, P. (2010). Where can they play? Outdoor spaces and physical activity among adolescents in the U.S. urbanized areas. *Preventive Medicine, 51*, 295–298. doi: 10.1016/j.ypmed.2010.07.013

Brownson, R. C., Baker, E. A., Housemann, R. A., Brennan, L. K., & Bacak, S. J. (2001). Environmental and policy determinants of physical activity in the United States. *American Journal of Public Health, 91*(12), 1995-2003. doi: 10.2105/AJPH.91.12.1995

Buchner, D. M., & Gobster, P. H. (2007). Promoting active visits to parks: Models and strategies for transdisciplinary collaboration. *Journal of Physical Activity and Health, 4* (Supplement 1), S36–S49.

Centers for Disease Control and Prevention (CDC). (2005). Trends in leisure-time physical inactivity by age, sex, and race/ethnicity - United States, 1994-2004. *Morbidity and Mortality Weekly Report, 54*(39), 991–994.

Centers for Disease Control and Prevention (CDC). (2009). *Behavioral Risk Factor Surveillance System Questionnaire*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.

Centers for Disease Control and Prevention (CDC). (2010a). *State indicator report on physical activity, 2010*. Atlanta, GA: U.S. Department of Health and Human Services.

Centers for Disease Control and Prevention (CDC). (2010b). *U.S. Physical Activity Statistics*. Retrieved from http://www.cdc.gov/nccdphp/dnpa/physical/stats/

Chavez, D. J. (2008). Connecting Latinos with nature. In D. J. Chavez, P. L. Winter & J. D. Absher (Eds.), *Recreation visitor research: Studies of diversity (General Technical Report PSW-GTR-210)* (pp. 157–162). Albany, CA: USDA Forest Service, Pacific Southwest Research Station.

Chavez, D. J., & Olson, D. D. (2008). Diverse users of four urban national forests: Participation, preferences, and perceptions. In D. J. Chavez, P. L. Winter & J. D. Absher (Eds.), *Recreation visitor research: Studies of diversity (General Technical Report PSW-GTR-210)* (pp. 63–74). Albany, CA: USDA Forest Service, Pacific Southwest Research Station.

Cohen, D. A., McKenzie, T. L., Sehgal, A., Williamson, S., Golinelli, D., & Lurie, N. (2007). Contribution of parks to physical activity. *American Journal of Public Health, 97*(509–514). doi: 10.2105/AJPH.2005.072447

Crawford, D., Timperio, A., Giles-Corti, B., Ball, K., Hume, C., Roberts, R., . . . Salmon, J. (2008). Do features of public open spaces vary according to neighbourhood socio-economic status? *Health & Place, 14*(4), 889–893.

Crespo, C., Smit, E., Anderson, R., Carter-Pokras, O., & Ainsworth, B. (2000). Race/ethnicity, social class and their relation to physical inactivity during leisure time: Results from the Third National Health and Nutrition Examination Survey, 1988-1994. *American Journal of Preventive Medicine, 18*, 46–53.

Decloe, M. D., Kaczynski, A. T., & Havitz, M. E. (2009). Social participation, flow, and situational involvement in recreational physical activity. *Journal of Leisure Research, 41*(1), 73–90.

Diez Roux, A. V., Evenson, K. R., McGinn, A. P., Brown, D. G., Moore, L. V., Brines, S. J., & Jacobs, D. R. (2007). Availability of recreational resources and physical activity in adults. *American Journal of Public Health, 97*(3), 493–499.

Fahmy, S. (2011). A heavy burden: Georgia's obesity epidemic. *UGA Research, 40*(2), 13–19.

Falb, M., Kanny, D., Thompson, S., Wu, M., & Powell, K. (2006). *Georgia Physical Activity Surveillance Report*. Atlanta, GA: Georgia Department of Human Resources, Division of Public Health, Chronic Disease, Injury and Environmental Epidemiology Section.

Flores, G. R. (2008). Active living in Latino communities. *American Journal of Preventive Medicine, 34*(4), 369–370.

Floyd, M. F., Spengler, J. O., Maddock, J. E., Gobster, P. H., & Suau, L. J. (2008). Park-based physical activity in diverse communities of two U.S. cities: An observational study. *American Journal of Preventive Medicine, 34*(4), 299–305.

Floyd, M. F., Taylor, W. C., & Whitt-Glover, M. (2009). Measurement of park and recreation environments that support physical activity in low-income communities of color: Highlights of challenges and recommendations. *American Journal of Preventive Medicine, 36*(4S), S156–S160. doi: 10.1016/j.amepre.2009.01.009

Georgia Department of Human Resources. (2008). *2008 Georgia Data Summary: Physical Activity*. Atlanta, GA: Georgia Department of Human Resources, Division of Public Health.

Georgia Department of Public Health. (2010). *2010 Georgia Physical Activity Surveillance Report*. Retrieved from http://health.state.ga.us/pdfs/epi/cdiee/2010%20Physical%20Activity%20Report.pdf

Georgia Department of Public Health. (2011). *Obesity Surveillance: Obesity Data Summary 2010*. Retrieved from http://health.state.ga.us/epi/cdiee/obesity.asp

Giles-Corti, B., Broomhall, M. H., Knuiman, M., Collins, C., Douglas, K., Ng, K., . . . Donovan, R. J. (2005). Increasing walking: How important is distance to, attractiveness, and size of pubic open space? *American Journal of Preventive Medicine, 28(2S2)*, 169–176. doi: 10.1016/j.amepre.2004.10.018

Giles-Corti, B., & Donovan, R. J. (2003). Relative influences of individual, social, environmental, and physical environmental correlates of walking. *American Journal of Public Health, 93*(9), 1583–1589.

Gobster, P. H. (2002). Managing urban parks for a racially and ethnically diverse clientele. *Leisure Sciences, 24*, 143–159.

Godbey, G., & Mowen, A. (2010). *The benefits of physical activity provide by park and recreation services: The scientific evidence.* Ashburn, VA: National Recreation and Park Association.

Godbey, G., Caldwell, L., Floyd, M., & Payne, L. (2005a). Contributions of leisure studies and recreation and park management research to the active living agenda. *American Journal of Preventive Medicine, 28*(2S2), 150–158.

Godbey, G. C., Caldwell, L. L., Floyd, M. F., & Payne, L. L. (2005b). Contributions of leisure studies and recreation and park management research to the active living agenda. *American Journal of Preventive Medicine, 28*(2, Supplement 2), 150–158.

Gordon-Larsen, P., Nelson, M., Page, P., & Popkin, B. (2006). Inequality in the built environment underlies key health disparities in physical activity and obesity. *Pediatrics, 117*(2), 417–424.

Ho, C. H., Payne, L., Orsega-Smith, E., & Godbey, G. (2003). Parks, recreation, and public health. *Parks and Recreation, 38*(4), 18–27.

Humpel, N., Owen, N., & Leslie, E. (2002). Environmental factors associated with adults' participation in physical activity. *American Journal of Preventive Medicine, 22*, 188–199.

Huston, S. L., Evenson, K. R., Bors, P., & Gizlice, Z. (2003). Neighborhood environment, access to places for activity, and leisure-time physical activity in a diverse North Carolina population. *American Journal of Health Promotion, 18*(1), 58–69.

Kaczynski, A. T., & Henderson, K. A. (2007). Environmental correlates of physical activity: A review of evidence about parks and recreation. *Leisure Sciences, 29*(4), 315–354. doi: 10.1080/01490400701394865

Kaczynski, A. T., Potwarka, L. R., & Saelens, B. E. (2008). Association of park size, distance, and features with physical activity in neighborhood parks. *American Journal of Public Health, 98*(8), 1451–1456.

Kaczynski, A. T., Potwarka, L. R., Smale, B. J., & Havitz, M. E. (2009). Association of parkland proximity with neighborhood and park-based physical activity: Variations by gender and age. *Leisure Sciences, 31*(2), 174–191.

Kline, J. D., Rosenberger, R. S., & White, E. M. (2011). A national assessment of physical activity in U.S. National Forests. *Journal of Forestry, 109*(7), 343–351.

Kruger, J., Mowen, A. J., & Librett, J. (2007). Recreation, parks, and the public health agenda: Developing collaborative surveillance frameworks to measure leisure time activity and active park use. *Journal of Physical Activity and Health, 4*(Supplement 1), S14–S23.

Larson, L. R., Whiting, J. W., Green, G. T., & Bowker, J. M. (2014). Physical activity locations in Georgia: Frequency of use by socio-demographic group. *Journal of Outdoor Recreation and Tourism, 5-6*, 68–72. doi: 10.1016/j.jort.2013.11.001

Macera, C. A., Ham, S. A., Yore, M. M., Jones, D. A., Ainsworth, B. E., Kimsey, C. D., & Kohl III, H. W. (2005). Prevalence of physical activity in the United States: Behavioral Risk Factor Surveillance System, 2001. *Preventing Chronic Disease, 2*(2), 1–10.

Manfredo, M. J., Driver, B. L., & Tarrant, M. A. (1996). Measuring leisure motivation: A meta-analysis of the recreation experience preferene scales. *Journal of Leisure Research, 28*(3), 188–213.

Marquez, D. X., & McAuley, E. (2006). Social cognitive correlates of leisure time physical activity among Latinos. *Journal of Behavioral Medicine, 29*(3), 281–289.

May, K. (2011). Access to parks: Barriers in rural communities. *Parks and Recreation, 46*(10), 57–58.

McCormack, G. R., Rock, M., Toohey, A. M., & Hignell, D. (2010). Characteristics of urban parks associated with park use and physical activity: A review of qualitative research. *Health & Place, 16*, 712–726. doi: 10.1016/j.healthplace.2010.03.003

McKenzie, T. L., Cohen, D. A., Sehgal, A., Williamson, S., & Golinelli, D. (2006). System for observing play and recreation in communities (SOPARC): Reliability and feasibility measures. *Journal of Physical Activity and Health, 3*(Supplement 1), S208–S222.

Michimi, A., & Wimberly, M. C. (2010). Spatial patterns of obesity and associated risk factors in the conterminous U.S. *American Journal of Preventive Medicine, 39*(2), e1–e12. doi: 10.1016/j.amepre.2010.04.008

Michimi, A., & Wimberly, M. C. (2012). Natural environments, obesity, and physical activity in nonmetropolitan areas of the United States. *The Journal of Rural Health, 28*, 398–407.

Mowen, A. (2010). *Parks, playgrounds and active living: Research synthesis (Active Living Research)*. San Diego, CA: Robert Wood Johnson Foundation. Retrieved from http://www.activelivingresearch.org/files/Synthesis_Mowen_Feb2010.pdf

Mowen, A., Kaczynski, A., & Cohen, D. (2008). The potential of parks and recreation in addressing physical activity and fitness. *President's Council on Physical Fitness and Sports: Research Digest, 9*(1), 1–8.

Mowen, A., Orsega-Smith, E., Payne, L., Ainsworth, B., & Godbey, G. (2007). The role of park proximity and social support in shaping park visitation, physical health, and perceived health among older adults. *Journal of Physical Activity and Health, 4*, 167–179.

Mowen, A. J., Payne, L. L., & Scott, D. (2005). Change and stability in park visitation constraints revisited. *Leisure Sciences, 27*(2), 191–204.

Mowen, A. J., Trauntvein, N. E., Graefe, A. R., & Son, J. S. (2012). The influence of visitor characteristics on state park physical activity levels. *Journal of Park and Recreation Administration, 30*(2), 19–40.

Nasar, J. L. (2008). Assessing perceptions of environments for active living. *American Journal of Preventive Medicine, 34*(4), 357–363.

Ogden, C. L., Carroll, M. D., Curtin, L. R., McDowell, M. A., Tabak, C. J., & Flegal, K. M. (2006). Prevalence of overweight and obesity in the U. S., 1999–2004. *Journal of the American Medical Association, 295*, 1549–1555.

Olshansky, S. J., Passaro, D. J., Hershow, R. C., Layden, J., Carnes, B. A., Brody, J., . . . Ludwig, D. S. (2005). A potential decline in life expectancy in the United States in the 21st century. *New England Journal of Medicine, 352*(11), 1138–1145.

Orsega-Smith, E. M., Payne, L. L., Mowen, A. J., Ho, C. H., & Godbey, G. C. (2007). The role of social support and self-efficacy in shaping the leisure time physical activity of older adults. *Journal of Leisure Research, 39*(4), 705–727.

Payne, L. L., Mowen, A. J., & Orsega-Smith, E. (2002). An examination of park preferences and behaviors among urban residents: The role of residential location, race, and age. *Leisure Sciences, 24*(2), 181–198.

Pearce, K. D. (1999). Race, ethnicity, and physical activity. *Journal of Physical Education, Recreation and Dance, 70*(1), 25–28.

Powell, L. M., Slater, S., Chaloupka, F. J., & Harper, D. (2006). Availability of physical activity-related facilities and neighborhood demographic and socioeconomic characteristics: A national study. *American Journal of Public Health, 96*(9), 1676–1680.

Pratt, C. A. (2008). Findings from the 2007 Active Living Research Conference: Implications for future research. *American Journal of Preventive Medicine, 34*(4), 366–368.

Rosenberger, R. S., Sneh, Y., Phipps, T. T., & Gurvitch, R. (2005). A spatial analysis of linkages between health care expenditures, physical inactivity, obesity and recreation supply. *Journal of Leisure Research, 37*(2), 216–235.

Roux, L., Pratt, M., Tengs, T. O., Yore, M. M., Yanagawa, T. L., Ven Den Bos, J., . . . Buchner, D. M. (2008). Cost effectiveness of community-based physical activity interventions. *American Journal of Preventive Medicine, 35*(6), 578–588. doi: 10.1016/j.amepre.2008.06.040

Rundle, A., Hagins, M., Orjuela, M., Mooney, L., Kim, M., & Perera, F. (2007). Traditional physical activity indexes derived from the Harvard Alumni Activity Survey have low construct validity in a lower income, urban population. *Journal of Urban Health: Bulletin of the New York Academy of Medicine, 84*(5), 722–733.

Rung, A., Mowen, A., Broyles, S., & Gustat, J. (2010, February). *The influence of park conditions and supporting features on park-based physical activity.* Paper presented at the Active Living Research Annual Conference, San Diego, CA.

Rung, A. L., Mowen, A. J., Broyles, S. T., & Gustat, J. (2011). The role of park conditions and features on park visitation and physical activity. *Journal of Physical Activity and Health, 8*(Supplement 2), S178–S187.

Rutten, A., Abel, T., Kannas, L., von Lengerke, T., Luschen, G., Diaz, J. A., . . . van der Zee, J. (2001). Self-reported physical activity, public health, and perceived environment: Results from a comparative European study. *Journal of Epidemiology and Community Health, 55*(2), 139–146.

Saelens, B. E., Frank, L. D., Auffrey, C., Whitaker, R. C., Burdette, H. L., & Colabianchi, N. (2006). Measuring physical environments of parks and playgrounds: EAPRS instrument development and inter-rater reliability. *Journal of Physical Activity and Health, 3* (Supplement 1), S190–S207.

Sallis, J. F., Bauman, A., & Pratt, M. (1998). Environmental and policy interventions to promote physical activity. *American Journal of Preventive Medicine, 15*, 379–397.

Sallis, J. F., Cervero, R. B., Ascher, W., Henderson, K. A., Kraft, M. K., & Kerr, J. (2006). An ecological approach to creating active living communities. *Annual Review of Public Health, 27*, 297–322.

Sallis, J. F., Hovell, M. F., & Hofstetter, C. R. (1992). Predictors of adoption and maintenance of vigorous physical activity in men and women. *Preventive Medicine, 21*, 237–251.

Sallis, J. F., & Saelens, B. E. (2000). Assessment of physical activity by self-report: Status, limitations, and future directions. *Research Quarterly for Exercise and Sport, 71*(2), 1–14.

Scruggs, P., Beveridge, S., Eisenmann, P., Watson, D., Schultz, B., & Ransdell, L. (2003). Quantifying physical activity via pedometry in elementary physical education. *Medicine and Science in Sports and Excercise, 23*, 235–251.

Shores, K., & West, S. (2008a). The relationship between built park environments and physical activity in four park locations. *Journal of Public Health Management Practice, 14*(3), E9–E16.

Shores, K. A., & West, S. T. (2008b). Physical activity outcomes associated with African American park visitation in four community parks. *Journal of Park and Recreation Administration, 26*(3), 75–92.

Shores, K. A., & West, S. T. (2010). Rural and urban park visits and park-based physical activity. *Preventive Medicine, 50*, S13–S17. doi: 10.1016/j.ypmed.2009.07.023

Siikamaki, J. (2011). Contributions of the U.S. state park system to nature recreation. *Proceedings of the National Academy of Sciences, 108*(34), 14031–14036. doi: 10.1073/pnas.1108688108

Skowron, M. A., Stodolska, M., & Shinew, K. J. (2008). Determinants of leisure time physical activity participation among Latina women. *Leisure Sciences, 30*(5), 429–447. doi: 10.1080/01490400802353174

Smith, J. W., Anderson, D. A., Davenport, M. A., & Leahy, J. E. (2013). Community benefits from managed resource areas: An analysis of construct validity. *Journal of Leisure Research, 45*(2), 192–213.

Sofi, F., Capalbo, A., Cesari, F., Abbate, R., & Gensini, G. F. (2008). Physical activity during leisure time and primary prevention of coronary heart disease: An updated meta-analysis of cohort studies. *Journal of Cardiovascular Risk, 15*(3), 247–257. doi: doi:10.1097/HJR.0b013e3282f232ac

Spence, J. C., & Lee, R. E. (2003). Toward a comprehensive model of physical activity. *Psychology of Sport & Exercise, 4*(1), 7.

Stodolska, M., & Shinew, K. J. (2010). Environmental constraints on leisure time physical activity among Latino urban residents. *Qualitative Research in Sport and Excercise, 2*(3), 313–335. doi: 10.1080/19398441.2010.517038

Stodolska, M., Shinew, K. J., & Li, M. Z. (2010). Recreation participation patterns and physical activity among Latino visitors to three urban outdoor recreation environments. *Journal of Park and Recreation Administration, 28*(2), 36–56.

Taylor, W. C., Floyd, M. F., Whitt-Glover, M. C., & Brooks, J. (2007). Environmental justice: A framework for collaboration between the public health and parks and recreation fields to study disparities in physical activity. *Journal of Physical Activity and Health, 4* (Supplement 1), S50–S63.

Thomas, A. J., Eberly, L. E., Smith, G. D., Neaton, J. D., & Stamler, J. (2005). Race/ethnicity, income, major risk factors, and cardiovascular disease mortality. *American Journal of Public Health, 95*(8), 1417–1423. doi: 10.2105/AJPH.2004.048165

Trost, S. G., Owen, N., Bauman, A. E., Sallis, J. F., & Brown, W. (2002). Correlates of adults' participation in physical activity: Review and update. *Medical Science and Sports Exercise, 34*(12), 1996–2001.

United States Census Bureau. (2012). *State & County QuickFacts: Georgia*. Retrieved from http://quickfacts.census.gov/qfd/index.html

United States Department of Health and Human Services. (2000). *Healthy People 2010: Understanding and improving health* (2nd ed.). Washington, DC: U.S. Government Printing Office.

Walker, J. T., Mowen, A. J., Hendricks, W. W., Kruger, J., Morrow Jr., J. R., & Bricker, K. (2009). Physical activity in the park setting (PA-PS) questionnaire: reliability in a California statewide sample. *Journal of Physical Activity and Health, 6*(Supplement 1), S97–S104.

Whiting, J. W., Larson, L. R., & Green, G. T. (2012). Monitoring visitation in Georgia state parks using the System for Observing Play and Recreation in Communities (SOPARC). *Journal of Park and Recreation Administration, 30*(3), 21–37.

Wilcox, S., Castro, C., King, A., Houseman, R., & Brownson, R. (2000). Determinants of leisure time physical activity in rural compared with urban older and ethnically diverse women in the United States. *Journal of Epidemiology and Community Health, 54*, 667–672.

Wilhelm Stanis, S. A., Schneider, I. E., & Anderson, D. A. (2009). State park visitors' leisure time physical activity, constraitns, and negotiation strategies. *Journal of Park and Recreation Administration, 27*(3), 21–41.

Wilhelm-Stanis, S. A., Schneider, I. E., Chavez, D. J., & Shinew, K. J. (2009). Visitor constraints to physical activity in park and recreation areas: Differences by race and ethnicity. *Journal of Park and Recreation Administration, 27*(3), 78–95.

Wilhelm-Stanis, S. A., Schneider, I. E., Shinew, K. J., Chavez, D. J., & Vogel, M. C. (2008). Physical activity among Hispanic/Latino and non-Hispanic/Latino white visitors on urban-proximate public lands. In D. J. Chavez, P. L. Winter & J. D. Absher (Eds.), *Recreation visitor research: Studies of diversity (General Technical Report PSW-GTR-210)* (pp. 113–122). Albany, CA: USDA Forest Service, Pacific Southwest Research Station.

Wilhelm-Stanis, S. A., Schneider, I. E., Shinew, K. J., Chavez, D. J., & Vogel, M. C. (2009). Physical activity and the Recreation Opportunity Spectrum: Differences in important site attributes and perceived outcomes. *Journal of Park and Recreation Administration, 27*(4), 73–91.