

Demographic Differences in Perceptions of Outdoor Recreation Areas Across a Decade

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EXECUTIVE SUMMARY: Outdoor recreation areas (ORAs) are key components of healthy communities and are linked with health behaviors, such as physical activity (PA). One way to promote greater use of ORAs, such as trails and parks, may be to increase awareness and improve perceptions of these spaces as safe, low-cost resources for PA. However, relatively few studies have examined the role of awareness of and perceptions about places to be active in ORA use, and even fewer have explored temporal changes in these factors within entire populations. Hence, this study examined differences that occurred across a decade and within demographic subgroups concerning awareness of, perceptions about, and use of ORAs in a Southeastern county. Cross-sectional telephone surveys with independent samples completed in 2000 ($n = 1,055$) and 2011 ($n = 1,011$) assessed respondents' perceptions of ORAs, PA levels, and demographic information. Logistic regression analyses and interaction models were used to examine changes in multiple outcome variables across time by demographic subgroups. Awareness of ORAs, perceived safety, and reported use of ORAs were associated with age, race, gender, and education level. Overall awareness of and perceptions about safety and the number of opportunities to be active improved between 2000 and 2011. However, more marked improvements were observed for some demographic groups than for others. Interaction models revealed awareness improved over time for Whites and for younger adults, while perceptions of safety improved among residents who were less educated and those who did not meet PA recommendations. The ORA use declined among females, but increased among males. Results suggested that promotion efforts may need to be directed toward minority populations and that safety may still be a theme to address in ORA use, especially among individuals who are already active elsewhere. For park and recreation practitioners, ongoing efforts to monitor perceptions about parks and recreational services may provide

insightful information about to whom to promote use of parks, trails, and other outdoor recreation areas. Examining differences within subgroups across time can help to identify potential priority populations to address in efforts to increase PA and encourage ORA use which in turn may address health disparities and improve public health.

KEYWORDS: *awareness, outdoor recreation areas, parks, perceptions, physical activity, safety, trails*

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Physical inactivity is the fourth leading cause of death worldwide (World Health Organization, 2010) and has been labeled the biggest public health problem of the 21st century (Blair, 2009). Physical inactivity is associated with an increased risk of negative health outcomes, including obesity, diabetes, cardiovascular diseases, hypertension, some forms of cancer, and mortality (Lee et al., 2012). Despite the well-known benefits of being active, more than half of all Americans do not accrue recommended levels of physical activity (PA) (Physical Activity Guidelines Advisory Committee, 2008). Furthermore, certain populations, including women and racial/ethnic minorities, have particularly low rates of leisure time PA (Crespo, Keteyian, Heath, & Sempos, 1996; Neighbors, Marquez, & Marcus, 2008). These health disparities may result from personal factors (e.g., a lack of awareness about the benefits of PA), ecological considerations (e.g., limited access to outdoor recreation resources), and concerns about the safety or quality of these outdoor settings (Carlson, Brooks, Brown, & Buchner, 2010; Vaughan et al., 2013; Wilson, Kirtland, Ainsworth, & Addy, 2004).

Public health researchers and practitioners now recognize the importance of the built environment in shaping diverse health behaviors and outcomes (Sallis, Floyd, Rodríguez, & Saelens, 2012). As one element of healthy communities, public parks, trails, and other outdoor recreation areas (referred to collectively hereafter as outdoor recreation areas or

ORAs) provide opportunities for PA and may have important implications for promoting population-level energy expenditure and improved health (Bedimo-Rung, Mowen, & Cohen, 2005; Kaczynski & Henderson, 2007). Emerging literature suggests opportunities for ORA use plays a crucial role in the amount of PA a community accrues (Han, Cohen, & McKenzie, 2013; Kaczynski & Henderson, 2007). However, differences often exist in PA participation and ORA availability and use by gender, age, race, and other demographic attributes (Babey, Hastert, Yu, & Brown, 2008; Carlson et al., 2010; Kaczynski, Wilhelm Stanis, Hastmann, & Besenyi, 2011; Trost, Owen, Bauman, Sallis, & Brown, 2002). For example, while some studies have found that ORA users tend to be White, well educated, and from higher socioeconomic status households (Reed, Hooker, Muthukrishnan, & Hutto, 2011), others have found that ORA use is higher among minorities (Lindsey, Han, Wilson, & Yang, 2008; Paxton, Sharpe, Granner, & Hutto, 2005).

While objective availability is important in shaping ORA use across diverse populations, subjective concerns are also thought to strongly influence these behaviors. Indeed, prior research suggests that individual perceptions of ORAs can affect both use and PA levels in these settings. Two important perceptions in particular, awareness and safety, are fundamental in shaping ORA behaviors (Cohen et al., 2010; Lackey & Kaczynski, 2009) and these often vary across population subgroups (Injae, Floyd, & Shinew, 2002; Madge, 1996). Several studies have recommended that attention be directed to increasing public recognition of and improving perceptions about ORAs in order to promote their use and increase PA, especially among populations that are traditionally less active overall (Starnes, Troped, Klenosky, & Doehring, 2001; Wolch et al., 2010).

To enhance use and PA levels at ORAs, it is important to understand whether coordinated efforts to promote these settings change (or do not change) peoples' perceptions as well as their actual utilization over time and for whom. However, few studies have examined the role of awareness of and perceptions regarding places to be active in ORA across diverse groups (Ball et al., 2008), as well as the temporal changes in these factors across broad populations (Mowen, Payne, & Scott, 2005). To address this gap, this study examines peoples' perceptions of ORAs (e.g., awareness, perceived safety, availability) as well as ORA use over time in a community with an active health-based social marketing campaign. This study also compares variations in these perceptions/behaviors across individuals with diverse sociodemographic characteristics.

Background Literature

Awareness/Knowledge of ORAs

Awareness and knowledge concerning the available ORA opportunities is an important precondition to subsequent attitudes and behaviors such as trail use (Reed et al., 2004), park visitation frequency (Mowen, Orsega-Smith, Payne, Ainsworth, & Godbey, 2007), and use of various recreation sites (Perdue, Long, & Allen, 1987). Studies investigating empirical relationships between knowledge levels and park behaviors have generally reported significant associations. For example, Walker and Crompton's (2013) study of institutional park constraints found that, while being informed about park plans was not an impediment to park use among residents, their perceived level of information concerning park facilities and programs was positively associated with park use; those more aware of these specific assets were more likely to use parks. Other studies from the public health literature have documented similar relationships with regard to park use and physical activity recreation behaviors. For example, Ries et al. (2009) reported that perceptions and knowledge of park availability were associated with a greater likelihood of park use, while Timperio, Crawford, Telford, and Salmon (2004) found that older girls who believed there were no parks/sports facilities near their homes reported lower levels of walking/cycling in their community.

Beyond these associations, lack of ORA awareness/knowledge is commonly identified as a barrier to park use. For example, in their national study of Americans' use/nonuse of

parcs, Godbey, Graefe, and James (1992) found that people did not use parks because they lacked sufficient information about these opportunities. Other studies have shown similar results and have identified lack of information as a primary factor inhibiting park use (Hatry & Dunn, 1971; Schroeder & Wiens, 1986). In their study of park visitation constraints and strategies to increase local park use, Scott and Munson (1994) found that urban park nonuse was associated with having insufficient information about them. When queried about strategies to increase their park use, 71% of park nonusers/infrequent users said they would visit more frequently if more information about parks were provided to them.

While research documents knowledge/awareness as an important barrier to park use and suggests a relationship between knowledge levels and subsequent use, sufficient awareness of local ORA opportunities is often problematic. Numerous studies have documented low to modest awareness levels even when ORA areas/facilities exist within close proximity. For example, Lackey and Kaczynski (2009) found only 18% of study participants correctly estimated whether they had a park within 750m from their home (with almost all of these being because they were unaware of an existing nearby park). Those whose perceptions did align with objective park proximity were significantly more likely to engage in park-based PA. Howard and Crompton (1984) found that, for two of the three communities in their study, over 20% of residents did not use ORAs because they had no knowledge of them. Likewise, Reed, Ainsworth, Wilson, Mixon, and Cook (2004) reported a majority of study participants (56%) were unaware of trails in their community and suggested this awareness gap resulted in the low overall use levels. In other ORA awareness studies, Spotts and Stynes (1984) assessed park knowledge in Lansing, Michigan and found their specific/detailed knowledge of these parks was quite limited. Finally, Hayward and Weitzer (1984) found even the most recent park users knew very little about their local park, knowing only two of five basic questions about park rules and services and recalling only about a third of the elements within their local park.

Research suggests that ORA awareness and knowledge levels vary considerably across individuals with different sociodemographic characteristics such as age, race/ethnicity, and socioeconomic status. For example, Spotts and Stynes (1984) found that older people were generally more aware of their local parks than younger people, but they had less detailed knowledge about them, particularly the newer parks. Studies have also found, as a constraint to park use, lack of awareness/knowledge varies across sociodemographic characteristics. For example, Scott and Jackson (1996) found younger people were more likely than older people to cite lack of information as a constraint limiting their park use, while Howard and Crompton (1984) identified low awareness was the most prominent constraint to park use among low-income respondents. Finally, Injae, Floyd, and Shinew's (2002) study of six Chicago area parks compared awareness levels across various sociodemographic characteristics finding both consistent and contradictory relationships with prior research. Injae et al., reported that individuals in the "low awareness" group were likely to be older, White, and more highly educated, with higher incomes, while "high awareness" members were likely to be African-American, less educated, with lower incomes, and were more likely to have a family with young children (Injae et al., 2002).

Collectively, these studies demonstrate that awareness of ORAs is a concern for organizations charged with promoting their use. Moreover, research suggests that awareness is not uniform across diverse populations and communities. Changing demographics and landscapes (e.g., new residents, new parks) make efforts to promote and monitor changes in ORA awareness a continual task for park managers/agencies. In light of their public health potential and the increasing number of community health campaigns to encourage their use (Centers for Disease Control and Prevention, 2011), there is a need to re-examine ORA knowledge/awareness, especially as potential places to be active in the community. Such awareness is likely to be more closely linked with PA in ORAs. Beyond ORA awareness, prior research also provides evidence that perceived safety can play a role in promoting or discouraging the public's use of ORAs and subsequently the PA that occurs in these spaces.

Perceived Safety of ORAs

Safety is an important element shaping individual physical activity levels (Babey et al., 2008) and recreation behaviors (Westover, 1985). Safety can be understood and assessed in a number of ways, whether as perceived safety (i.e., how safe one feels in and around public spaces, fear of crime) or objective safety (i.e., actual crime rates, pedestrian fatalities; Bedimo-Rung, Mowen, & Cohen, 2005). The presence of incivilities and other signs of disorder (e.g., vandalism, gang symbols) have sometimes been used as surrogate measures of safety and Stodolska, Shiness, Acevedo, and Izenstark (2011) found that perceived safety from crime (among Mexican-American park visitors) could be further understood in terms of interracial conflict and safety from discrimination. Safety, and its effects on behaviors, has been assessed across entire neighborhoods (Weir, Etelson, & Brand, 2006) and across different types of recreational settings (Burns, Lee, & Graefe, 1999; Herzog & Miller, 1998; Ries et al., 2009). Safety can affect whether people decide to visit these spaces, who they go with, when they go, and how long they stay.

Studies have assessed relationships between safety, physical activity, and ORA use, but have yielded conflicting results. On one hand, perceived or objective safety measures have been associated with self-reports of neighborhood-level (Babey et al., 2008; Gomez, Johnson, Selva, & Sallis, 2004; Molnar, Gortmaker, Bull, & Buka, 2004) as well as park-specific behaviors (Quebec en Forme, 2011; Gobster, 2002; Leslie, Cerin, & Kremer, 2010; Ries et al., 2009). The safer these areas were perceived/observed to be, the more likely respondents reported using them or the more likely respondents were to be physically active. Conversely, numerous other studies report no such relationship (Bai, Wilhelm Stanis, Kaczynski, & Besenyi, 2013; Kaczynski, Potwarka, & Saelens, 2008; Sugiyama & Thompson, 2008) or report that safety was unrelated to observed park utilization levels (Cohen et al., 2010).

Such discrepancies could be a function of measurement variations (studies combining park safety with other indicators) as well as the different populations/groups studied across these investigations. Several studies suggest that neighborhood context and personal characteristics shape the nature of these types of relationships. For example, Roman and Chalfin (2008) concluded that residents of high crime areas were more constrained in their outdoor walking by safety, while Foster and Giles-Corti (2008) noted that safety affects the physical activity of populations who exhibit greater anxiety about crime. Further, Weir et al. (2006) found that inner city parents expressed greater anxiety about neighborhood safety than did suburban parents and these perceptions were correlated with their children's PA levels.

Studies focusing specifically on ORAs have found variations in safety across a number of sociodemographic characteristics; particularly sex/gender. For example, Scott and Jackson (1996) found that older women were more constrained in their park use due to fear of crime, while Westover (1985) reported females were more likely to report fear and avoidance of ORAs. Interestingly, Westover found that direct personal experience with crime and other incivilities was not strongly associated with feelings of safety or avoidance.

Race/ethnicity has also been linked to varying perceptions of ORA safety. For example, crime/safety was identified as a concern among Mexican-Americans' use of urban parks (Stodolska et al., 2011) and Madge's (1996) study from the United Kingdom found that fear of crime was a deterrent to park use among Asian and African-Caribbean populations (racial attacks), as well as women (sexual attacks) and the elderly (muggings). Gobster's (2002) study of visitors at Chicago's Lincoln Park, however, found Whites to be more than twice as likely as other racial/ethnic groups to say the park was unsafe with nearly half identifying specific places where they felt unsafe. While research regarding the implications of park safety upon actual visitation levels and PA is mixed, it is nevertheless an important part of engaging communities to encourage use (Luymes & Tamminga, 1995). Improving safety perceptions is, in fact, a key objective of numerous park policies, environmental changes, and promotional efforts.

Summary

Emerging literature demonstrates that residents are often unfamiliar with their local parks and trails (Lackey & Kaczynski, 2009; Reed et al., 2004) and that being aware of such settings is associated with use of and PA in those areas (Lee, Floyd, & Shinew, 2002; Reed, 2006). Likewise, perceptions of safety and availability are important in affecting use of and activity within ORAs (Bai et al., 2013). This research suggests that improving familiarity with and perceived safety of parks and trails could translate into increased use of ORAs for health-enhancing behaviors.

Numerous park, public health, and other community-based initiatives have been implemented to increase public awareness of parks and perceptions of these areas as safe places for PA. However, relatively few studies have examined the role of awareness/perceptions of ORAs as places to be active, and even fewer have explored temporal changes in public perception/awareness as the result of these collective actions. One study did examine changes in public perceptions in light of a park district's collective efforts to address park use constraints (Mowen, Payne, & Scott, 2005). This study found that fear of crime declined across the overall sample, but that Blacks, as well as respondents with lower incomes/education levels, were still more likely than Whites and respondents with higher incomes/education levels to report fear of crime as a park use constraint. However, this particular study did not consider how other perceptual factors related to park use and PA over time and it did not assess these issues in a community with an active health-promotion campaign. As such, the efficacy of health promotion efforts to change park perceptions for the purpose of increased ORA utilization and physical activity has been less clear.

Study Purpose

The purpose of this study was to examine across time and within demographic subgroups differences in awareness of, perceptions about, and use of ORAs in a region with an active PA promotion campaign. A better understanding of such changes will lead to improved efforts to promote awareness of ORAs and opportunities for PA, especially among low-active groups. Having such evidence would help organizations identify key audiences to focus on in their health promotion campaigns and help them to understand what elements are changeable and which are not.

Since 2000, a Centers for Disease Control and Prevention-funded research center and a community-based organization involving multiple stakeholders have partnered to create an active community environment as well as to increase awareness of and access to opportunities for outdoor recreation in Sumter County, South Carolina. This included community capacity development training and the distribution of mini-grants to foster community improvement projects such as public park renovations and new walking trails (Sharpe et al., 2015). Other efforts included community education, awareness activities (Sharpe et al., 2011), and social marketing (Sharpe et al., 2010; Wilson et al., 2010) to promote PA and use of recreation facilities within the county. While certain efforts prioritized specific underserved groups (such as women and low-income neighborhoods), the overall goal of the community partnership was to benefit residents across the county. These activities have continued in various forms for over a decade. The purpose of this present study is to examine across time and within demographic subgroups differences in awareness of, perceptions about, and use of ORAs in this central South Carolina county. A better understanding of such changes will lead to improved efforts to promote ORAs and opportunities for PA, especially among low-active groups. The following research questions guided the present investigation:

1. How did perceptions regarding awareness, safety, and availability of ORAs change over time by specific subgroups?
2. How did use of ORAs change over time by specific subgroups?

Method

Study Setting

Sumter County, SC is located in a rural area of the state and had a population of approximately 107,500 residents in 2010 (U.S. Census Bureau, 2010). The community is demographically diverse, with the two largest racial groups being Blacks (47.0%) and Whites (49.4%). Up from 13% in 2000, approximately 18% of residents within the county lived at or below the federal poverty level in 2010, and 17.8% held a bachelor's degree or higher. In 2010, approximately 51.9% of the population was female and the median age was 37.5 years (U.S. Census Bureau, 2010).

Data Collection

Cross-sectional telephone surveys were conducted with independent samples across the county in May and June of 2000 and 2011 using a random digit dial telephone interviewing system. All phone numbers were provided by Survey Sampling, Inc., and interviews were conducted by the University of South Carolina Institute for Public Service and Policy Research. At least 10 calls were made to both land lines and cell phones on weekdays, weekends, and during evening hours. Using the "next birthday" method, one adult aged 18 or older from each household was invited to participate in the survey. Eligibility included residing within the county at least four days out of the week and at least six months of the year, being at least partially able to participate in some form of moderate PA (i.e., sports, gardening, walking at a moderate pace), and being able to leave the house independently. Participants who were reached on a cell phone in 2011 were only eligible if they did not also have a land line. This prevented the potential for duplicate eligible households. In 2000, 1,055 surveys were completed from a total of 1638 residents who were called (64.4% response rate). In 2011, 4,284 residents were called and 1,011 surveys were completed (23.6% response rate). Further information about the sample and data collection can be found elsewhere (Sharpe, Granner, Ainsworth, & Hutto, 2004; Schoffman et al., 2014).

Measures

A community coalition identified variables that were deemed feasible as targets for intervention, and items were chosen for inclusion in the survey in partnership with the research team. Pretest telephone interviews were conducted with 22 randomly selected Sumter County residents. Based on these results, several transition statements were added to the questionnaire to improve the flow of the interview. As well, standard probes were developed for several questions for use when respondents initially gave a "don't know" response. No problems with any questions were identified during the course of data collection.

Demographics. Participants were asked to report their gender, race/ethnicity, age, years of education, and height and weight (which were used to calculate body mass index as kg/m²). These variables were dichotomized as follows for ease of interpretation: male and female, non-Hispanic White and Black (the 3% of participants who reported another race or ethnicity were excluded), 18–39 years and 40+ years, ≤12 years of school and 13+ years of school, and normal weight and overweight or obese.

Physical activity level. The PA module from the Behavioral Risk Factor Surveillance System (Centers for Disease Control and Prevention, 2000, 2011) was used to assess whether participants met recommended PA guidelines. Three questions assessed participation, frequency, and duration of moderate-intensity PA performed in bouts of at least 10 minutes in a typical week, and three questions assessed these same variables for vigorous-intensity PA. Between 2000 and 2011, the PA guidelines changed to accommodate for combining minutes across moderate and vigorous activities. To account for this, vigorous-intensity minutes were weighted (multiplied) by two and summed with moderate-intensity minutes for both samples. Responses were then dichotomized into those who met PA guidelines

(acquiring a combination of at least 150 moderate or 75 vigorous minutes of activity per week; Physical Activity Guidelines Advisory Committee, 2008) versus those who did not. The items were coded 0 and 1 for not meeting or meeting recommendations, respectively.

Dependent variables for the current study included the following:

Awareness of ORAs. Participants reported the extent to which they agreed (1=*strongly agree* to 4=*strongly disagree*) that they hear a lot about places to be active within their county. Responses were reverse-coded and then dichotomized into either agreement (3 or 4) or disagreement (1 or 2).

Reported number of ORAs for use. Participants reported how many different public parks, trails, and other outdoor recreational areas that they might use were available within their county. On average, participants reported three ORAs and responses were then dichotomized to reflect participants who reported 0-2 versus 3+ ORAs.

Perceived adequacy of and safety within ORAs. To assess perceptions of ORA adequacy, participants reported whether they agreed (yes or no) that there were an adequate number of parks, trails, and outdoor recreational areas in the county. Safety of ORAs was assessed using a four-point scale (1=*very safe*, 4=*very unsafe*). Responses were reverse coded and then dichotomized to create relatively even groups of those who reported feeling *very safe* (4) versus those who reported any other response (hereafter referred to as *less safe*).

Reported use of ORAs. Participants reported the number of days in a typical month that they use: i) a trail/track/pathway for PA or ii) any public park or other ORA for PA. Responses for both questions were almost evenly split into those who reported no use versus those who reported at least one or more days during a typical month.

Analysis

Descriptive statistics and chi-square analyses were used to describe the characteristics of the sample during each survey year and differences by year with respect to sample demographics and the six outcome variables. Variables were dichotomized using relevant cut points in order to distribute data evenly across categories and to facilitate ease of interpretation. Likewise, because the nature or distribution of most of the outcome variables lent themselves to being dichotomous (e.g., meets/does not meet PA recommendations), logistic regression analyses were used to examine the main effects of time (variable: year) as well as the six demographic predictor variables (gender, race, age, BMI, education level, PA level) on each of the six outcomes described above, while controlling for all other main effects. Finally, to assess whether differences by time (year) varied across demographic subgroups, interaction terms (e.g., time \times gender) were tested using logistic regression models that controlled for all other main effects for each outcome variable. All analyses were conducted using SPSS 19.0 and the criterion for statistical significance was set at $p \leq 0.05$.

Results

Sample Descriptive Characteristics

A total of 1,055 surveys were completed with respondents in 2000 and 1,011 were completed in 2011. Table 1 (top) shows that in both samples, over half of participants were female (58.4% in 2000, 63.7% in 2011) and White (57.0% in 2000, 55.4% in 2011). The mean age of respondents was 44.9 years in 2000 and 53.1 in 2011. The mean BMI of respondents was 26.7 kg/m² in 2000 and 28.5 kg/m² in 2011. The average years of educational attainment was 13.1 in 2000 and 13.9 in 2011. The percentage of participants meeting PA recommendations in 2000 was 54.1% and 54.8% in 2011. Participants in 2011 were more likely to be female, 40+ years, overweight or obese, and more highly educated as compared to those in 2000 ($\chi^2 = 5.98-54.09$, all $p < 0.05$).

Table 1*Sample Characteristics and Outcomes by Year*

	2000 (N=1055)	2011 (N=1011)
	N (%)	
Gender^(a)		
Male	419 (41.6)	367 (36.3)
Female	588 (58.4)	644 (63.7)
Race		
White	572 (59.6)	551 (56.8)
Black/African American	388 (40.4)	419 (43.2)
Age^(a)		
18-39 years	432 (43.8)	283 (28.0)
40+ years	555 (56.2)	728 (72.0)
BMI^(a)		
Normal weight	402 (42.6)	291 (31.0)
Overweight or Obese	541 (57.4)	648 (69.0)
Education^(a)		
13 years or more	539 (53.6)	611 (60.4)
12 years or less	467 (46.4)	400 (39.6)
Physical Activity Level		
Meets Recommendations	547 (54.1)	535 (54.8)
Does Not Meet Recommendations	464 (45.9)	441 (45.2)
Aware of Ways to be Active^(a)		
Disagree	317 (32.1)	251 (25.7)
Agree	670 (67.9)	727 (74.3)
Reported Number of ORAs^(a)		
0-2	569 (60.3)	490 (52.9)
3 or more	375 (39.7)	437 (47.1)
Adequate Number of ORAs^(a)		
Disagree	362 (38.2)	268 (29.0)
Agree	586 (61.8)	655 (71.0)
Perceived Safety in ORAs^(a)		
Less Safe	743 (79.7)	672 (69.8)
Very Safe	189 (20.3)	291 (30.2)
Reported Use of Trails^(a)		
Did not use	585 (57.9)	621 (62.2)
1 day or more/month	425 (42.1)	377 (37.8)
Reported Use of all ORAs^(a)		
Did not use	554 (54.8)	636 (64.0)
1 day or more/month	457 (45.2)	358 (36.0)

^(a) Pearson Chi-square indicated statistically significant ($p < .05$) differences in sample characteristics across time.

ORA: Outdoor recreation area

Table 1 (bottom) also shows significant differences between time points in the dependent variables ($\chi^2=3.87-24.74$, all $p<0.05$). Specifically, a greater percentage of participants in 2011 than 2000 agreed they were aware of ways to be active, estimated that there were three or more ORAs that they could use in the County, agreed there were an adequate number of ORAs, and reported feeling safe in ORAs. However, the percentage of participants reporting that they had used ORAs at least one day per month was significantly lower in 2011 (36%) as compared to 2000 (45%; Table 1).

Tables 2 and 3 (top half of each table) summarize the logistic regression odds ratios and confidence intervals for the association between each demographic variable (main effect) and each of the six perceptions or behavioral outcome variables while adjusting for all other main effects. The latter half of each table then shows several analyses that test the interaction between time (year) and a single predictor variable (gender, race, age, BMI, education, PA level) while adjusting for all other main effects.

Table 2

Association of Demographic Variables with Awareness and Perceived Adequacy of ORAs

Predictor	Awareness of ORAs		Reported Number of ORAs		Adequate Number of ORAs	
	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI
Adjusted Main Effects						
Year (2011)	1.24	0.99-1.54	1.34	1.09-1.64**	1.52**	1.23-1.89
Gender (Female)	1.10	0.88-1.38	0.89	0.72-1.09	0.71**	0.57-0.88
Race (Black/AfrAm)	1.05	0.83-1.31	1.08	0.88-1.33	0.82	0.66-1.03
Age (40+ years)	1.89**	1.52-2.38	1.01	0.82-1.24	1.57**	1.29-1.96
BMI (Overweight/Obese)	0.88	0.70-1.10	0.98	0.79-1.22	0.85	0.68-1.07
Education (12 yrs or Less)	1.33**	1.07-1.67	0.87	0.71-1.07	1.66**	1.34-2.07
Physical Activity Level (Does Not Meet Recommendations)	0.96	0.77-1.20	0.88	0.71-1.07	1.20	0.96-1.49
Interactions						
Gender*Year	0.92	0.59-1.42	1.14	0.76-1.71	0.86	0.55-1.33
Race*Year	0.76	0.49-1.18	0.65*	0.44-0.98	0.94	0.61-1.45
Age*Year	0.60*	0.39-0.95	0.98	0.65-1.48	0.72	0.46-1.12
BMI*Year	0.81	0.52-1.28	1.08	0.71-1.63	1.06	0.68-1.66
Education*Year	1.06	0.68-1.65	0.79	0.53-1.18	0.88	0.57-1.36
Physical Activity Level*Year	1.29	0.83-1.99	0.93	0.63-1.39	1.20	0.78-1.83

Each model contained the single, specified interaction term, as well as each main effect variable and covariates. Reference groups for main effect variables were Year: 2000, Gender: Males, Race: White, Age: 18-39 years, BMI: Normal Weight, Education: 13 years or more, Physical Activity Level: Meets PA Recommendations.
* $p<.05$, ** $p<.01$

Awareness of ORAs

Table 2 shows the main effects of both age and education were significantly associated with awareness of ORAs. Specifically, adults age 40 and older were almost two times as likely to agree they were aware of places to be physically active than were 18- to 39-year-olds. Likewise, those with less education were more likely to report greater awareness than those with more education.

There was also a significant age \times year interaction, such that the difference between age groups in awareness of ORAs varied between time points. Figure 1a shows that while older adults (40+ years) reported similar levels of awareness at both time points (2000=74.5%, 2011=76.1%), younger respondents were more likely to report greater awareness of ORAs in 2011 (69.9%) than in 2000 (59.0%).

Table 3

Association of Demographic Variables with Perceived Safety and Use of ORAs

Predictor	Perceived Safety in ORAs		Reported Use of Trails		Reported Use of All ORAs	
	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI
Adjusted Main Effects						
Year (2011)	1.84**	1.45-2.33	0.99	0.81-1.22	0.76**	0.62-0.93
Gender (Female)	0.72**	0.57-0.91	0.86	0.70-1.06	0.73**	0.59-0.90
Race (Black/AfrAm)	1.54**	1.22-1.95	1.54**	1.25-1.89	1.25**	1.01-1.5
Age (40+ years)	1.08	0.85-1.38	0.45**	0.37-0.56	0.34**	0.27-0.42
BMI (Overweight/Obese)	0.90	0.71-1.15	1.03	0.83-1.27	0.99	0.79-1.22
Education (12 yrs or Less)	1.09	0.86-1.37	0.88	0.72-1.08	1.05	0.86-1.29
Physical Activity Level (Does Not Meet Recommendations)	0.98	0.78-1.24	0.71**	0.58-0.89	0.69**	0.56-0.85
Interaction Terms						
Gender*Year	0.98	0.62-1.55	0.55**	0.37-0.82	0.72	0.48-1.09
Race*Year	1.47	0.93-2.33	0.76	0.51-1.13	0.79	0.52-1.19
Age*Year	0.80	0.49-1.29	1.31	0.87-1.98	1.08	0.71-1.65
BMI*Year	1.18	0.73-1.90	1.06	0.70-1.61	1.03	0.67-1.57
Education*Year	1.94**	1.22-3.09	1.01	0.68-1.51	0.93	0.62-1.40
Physical Activity Level*Year	1.67	1.05-2.65*	0.72	0.48-1.07	0.77	0.51-1.61

Each model contained the single, specified interaction term, as well as each main effect variable and covariates.

Reference groups for main effect variables were Year: 2000, Gender: Males, Race: White, Age: 18-39 years, BMI: Normal Weight, Education: 13 years or more, Physical Activity Level: Meets PA Recommendations.

* $p \leq .05$, ** $p \leq .01$

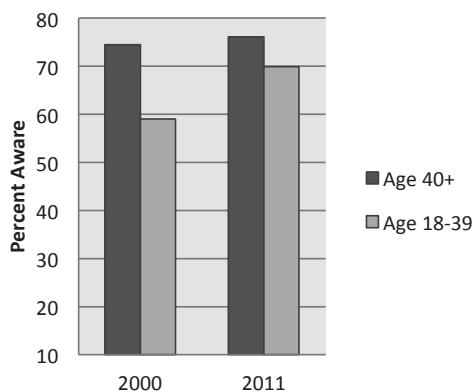


Figure 1a. Awareness of ORAs by Age

Perceived Number of ORAs Available

Time (year) was significantly associated with the number of ORAs reported (Table 2), as participants in 2011 were more likely than participants in 2000 to report three or more ORAs. There was also a significant race x year interaction (Table 2). As shown in Figure 1b, the percentage of Blacks reporting three or more ORAs was similar in 2000 (43.0%) and 2011 (43.4%), whereas more Whites in 2011 (48.9%) than 2000 (37.6%) reported at least three ORAs.

Authors: Editor Jim Busser queried whether or not Figures 1a-through 1e could be combined into a single table?

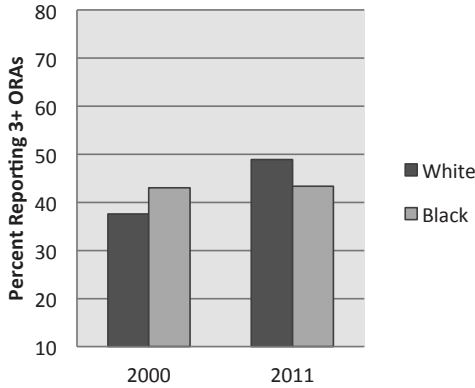


Figure 1b. Reported Number of ORAs by Race

Perceived Adequacy of ORAs

Time (year), gender, age, and education level were all associated with the perceived adequacy of ORAs. Women were 0.71 times as likely than men to agree there were an adequate number of ORAs, while 2011 respondents (year = 2011), older adults, and those with less education were all more likely to agree there were an adequate number of ORAs. No year × demographic variable interactions were significant.

Perceived Safety within ORAs

Table 3 indicates respondents were nearly two times as likely to report feeling *very safe* in 2011 than in 2000. Black respondents were 1.54 times more likely to report feeling *very safe*, however, female respondents were 0.72 times as likely to report feeling very safe than male respondents.

Two year × demographic interactions were significant for perceived safety in ORAs. The year × education interaction (shown in Figure 1c) indicated the percentage of those feeling *very safe* nearly doubled among those with less education between 2000 (18.8%) and 2011 (34.8%). This difference was not significant in more educated respondents (21.5% and 27.3%, respectively). Similarly, Figure 1d illustrates the time × physical activity interaction. The difference in perceived safety between 2000 and 2011 was more striking among individuals who did not meet PA recommendations (18.4% in 2000 and 32.9% in 2011) than those who met recommendations (21.5% in 2000 and 29.0% in 2011).

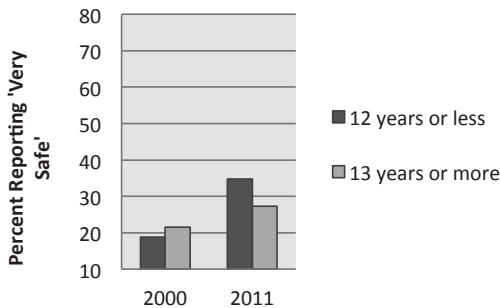


Figure 1c. Perceived Safety by Education

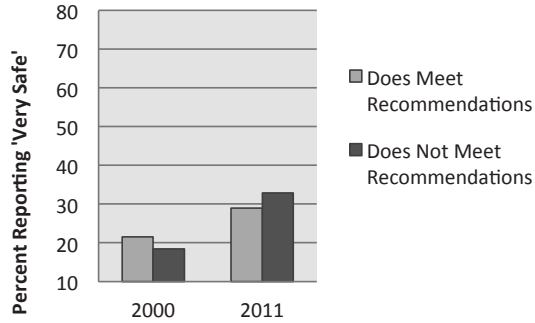


Figure 1d. Perceived Safety by PA Level

Reported Use of Trails

Table 3 shows that race, age, and PA level were all associated with reported trail use. Specifically, trail use of one or more days within a typical month was greater in Blacks, adults ages 18 to 39 years, and participants who met PA recommendations.

Gender \times time was the only significant interaction for reported trail use. Figure 1e indicates the percentage of women reporting trail use was lower in 2000 than 2011 (43.1% versus 33.7%), the opposite pattern was seen in men (40.6% versus 44.9%).

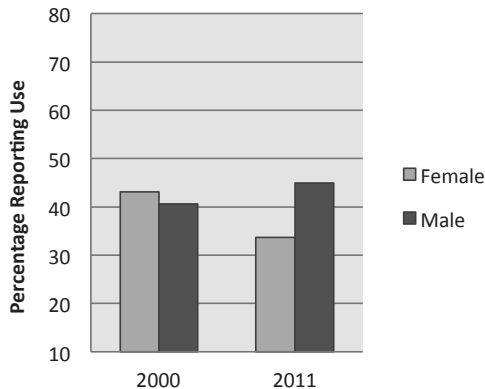


Figure 1e. Reported Trail Use by Gender

Reported Use of Outdoor Recreation Areas

Table 3, year, gender, race, age, and PA level were all associated with reported ORA use. Blacks were 1.25 times more likely to report using parks or ORAs than Whites, while respondents in 2011, females, adults age 40 and above, and those who did not meet PA recommendations were all less likely to report ORA use. No significant interactions were observed in the effect of the demographic variables on ORA use over time.

Discussion

This study provided several key insights related to differences between demographic subgroups and across time with respect to awareness of, perceptions about, and use of ORAs. Results indicate that overall awareness of and perceptions about safety and the number of opportunities to be active in Sumter County improved between 2000 and 2011,

which may have been due to the social marketing campaign that took place during this time period. Similar to previous studies (Injae, Floyd, & Shinew, 2002; Spotts & Stynes, 1984), older adults and those with less education were more likely to be aware of ORAs than younger adults and those with more education, respectively. Unlike a previous study in which younger adults reported lack of information as a constraint to park use over time (Mowen, Payne, & Scott, 2005), the current data highlight more marked improvements in awareness in younger adults than older adults over time. The gap between age groups in perceived awareness of ORAs was much smaller in 2011 than in 2000 (Figure 1a) and suggests age may currently be less of a factor to consider when promoting ORAs. Conversely, this finding could also suggest the social marketing and community advocacy efforts (described previously) to promote ORA awareness were more salient for younger than older age groups. However, unlike previous studies that have linked awareness of facilities with use (Reis et al., 2009; Walker & Crompton, 2013), this study indicates that while awareness of ORAs increased, especially among younger adults, reported use of those facilities did not. This suggests that increasing awareness about ORAs may not be enough to facilitate visitation and use of ORAs in this population. Thus, while limited awareness has previously been cited as a barrier to park use (Scott & Jackson, 1996), future studies may seek to investigate potential additional barriers to ORA use among younger adults.

As well, perceptions of safety within ORAs improved between 2000 and 2011 in this area. This suggests that concerns about safety were less of a barrier to ORA use in 2011 than in 2000, yet overall use of ORAs did not improve. Examining these associations by demographic variables lends further insight. Similar to previous studies, females were less likely to feel safe in ORAs than males (Westover, 1985), and blacks were more likely to report feeling safe in ORAs than whites. Differences in perceived safety over time were more discernible for those with less education (Figure 1c) as well as for those who did not meet PA recommendations (Figure 1d), who reported greater increases in safety perceptions than those with more education and those who did meet PA recommendations. Given that persons with less education and those who do not meet PA recommendations are more likely to be obese and less healthy overall (Braveman, Cubbin, Egerter, Williams, & Pamuk, 2010; Sharpe, Granner, Hutto, Ainsworth, & Cook, 2004), the improvements in perceived safety within these demographic subgroups is encouraging and may suggest that safety is no longer a potential barrier to ORA use among these demographic subpopulations. Unlike a previous study in which park utilization increased despite no decline in perceived constraints to park visitation (Mowen, Payne, & Scott, 2005), the current data saw no overall improvements to ORA use, despite improvements in two potential barriers to ORA use. Taken together, these data suggests that previously established barriers may not be constraints to ORA and park use, or that other factors beyond awareness and safety are necessary for increasing ORA use in these populations. Continuing to examine differences in perceived safety as well as other barriers to ORA use over time can help practitioners identify groups who may be less likely to use ORAs and thus both who and how to target in efforts to promote visitation and PA within ORAs (Luymes & Tammingo, 1995).

Participants meeting PA recommendations were more likely to report using a trail or other ORA than those who did not meet recommendations, suggesting the use of ORAs might be associated with meeting PA guidelines (Kaczynski & Henderson, 2007). The relationship of ORA use and meeting PA guidelines has not been widely assessed, and has shown mixed results (Starnes, Troped, Klenosky, & Doehring, 2011). However, one study that examined this relationship by socioeconomic subgroup reported the presence of ORAs was associated with meeting PA recommendations in low-income neighborhoods but not high-income neighborhoods (Wilson, Kirtland, Ainsworth, & Addy, 2004b). This suggests opportunities for outdoor recreation may be particularly salient in low income, and potentially low-active, communities.

Implications for Practice

Improving awareness of and perceived safety within ORAs could increase use of these facilities. Exploring temporal trends in a variety of outcomes and according to multiple sociodemographic characteristics may help to illuminate sources of health disparities for particular population subgroups and can help park and recreation practitioners identify patterns of ORA use. As an example, the current data reveal that while ORA use appears to have declined over this time period, a closer examination by subgroups reveals this pattern was only true for women, whereas ORA use in men was actually increasing (Figure 1e). This may be particularly important to help tailor strategies to promote use of ORAs. Results indicate future efforts should specifically target use among women (Sharpe et al., 2010). Data also suggests that safety concerns existed mostly among women, which may lend insight into the decline in ORA use (Green, Bowker, Wang, Cordell, & Johnson, 2009). Future strategies for promoting ORA use should include efforts to improve perceptions of safety among women. These strategies might include educating local female residents about safe practices while in ORAs or encouraging local law enforcement and public safety officers to monitor these areas. As well, organizing group events and activities within ORAs may help women feel safer.

Periodic community surveillance studies of this type may prove a valuable tool for prioritizing segments of citizens that might benefit from interventions to enhance awareness of recreation spaces and improve perceptions about safety or other qualities of these resources. For example, while the sample participants were much older in 2011 than in 2000, age appeared to be less of an indicator of awareness of ORAs in 2011 than 2000. These results suggest older groups may not need information about where parks are located, but rather, they may respond to other incentives, such as the formation of walking groups to promote ORA use and PA among older adults (Addy et al., 2004).

Further, while the promotion of parks and trails may be necessary to see improvements in visitation and use, ORAs and the agencies that operate them are unlikely to have the budgetary resources to advertise their availability and benefit to the public (Crompton & Kaczynski, 2003). However, encouraging ORA use through other health promotion campaigns may serve a dual purpose. In the current study, a community-based organization worked within Sumter County, South Carolina for several years to promote active lifestyles and enhance awareness about opportunities for PA in local areas. These efforts served as a model for the promotion of parks, trails, and other ORAs (Sharpe et al., 2010) and concomitantly may lead to increased use of these resources and greater overall PA participation and public health.

Conclusion

This study's findings should be interpreted in light of certain limitations, including the potentially unique and changing nature of the study setting and the use of self-reported data and many expedient single-item measures. As well, the two separate and cross-sectional samples at different time points do not allow for the direct examination of changes in individuals over time, but rather insights into the overall tenor of community sentiment over a decade-long period. The low response rates to the phone survey should also be noted as should the fact that household income information was not collected.

In summary, the changes observed over time suggest that ongoing efforts to monitor perceptions about parks and recreational services may provide detailed insight about to whom to promote use of parks, trails, and other ORAs. Examining these data by demographic subgroups across time points revealed specific populations that might be at risk for decreased use and PA based on awareness and perceptions of ORAs. Such findings can aid practitioners in developing more targeted and tailored strategies to promote awareness, improve safety perceptions, and increase overall use of ORAs. Future studies should seek to examine how these and other subjective factors are associated with PA within these areas and how best to promote PA in communities via existing opportunities for outdoor recreation.

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