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Parks and physical activity: Why are some parks used more than others?

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Abstract

Objective—To assess how park characteristics and demographic factors are associated with park use.

Methods—We studied a diverse sample of parks in a Southern California metropolitan area in 2006–2008 representing a variety of racial and ethnic communities of different socioeconomic strata. We surveyed 51 park directors, 4257 park users and local residents, and observed 30 parks. We explored relationships among the number of people observed, the number of park programs offered, number of organized activities observed, park size, existence of park advisory board, perceptions of safety, and population density and characteristics.

Results—The strongest correlates of the number of people using the park were the park size and the number of organized activities observed. Neighborhood population density, neighborhood poverty levels, perceptions of park safety, and the presence of a park advisory board were not associated with park use.

Conclusion—While perceptions of low safety have been considered a barrier to park use, perceptions of high safety do not appear to facilitate park use. Having events at the park, including sports competitions and other attractions, appears to be the strongest correlate of park use and community-level physical activity.

Keywords

Physical activity; Parks; Programming; Safety; Population

Introduction

The original parks movement was initiated in the mid 1800s in Europe as a means to provide the common people a respite from the crowding and pollution due to industrial urbanism (LeGates and Stout, 1998). Multiple benefits of parks to health and well-being have since been recognized (Driver et al., 1991; Godbey et al., 1992; Bedimo-Rung et al., 2005; Ho et al., 2005), but the idea that parks should function as a population-wide treatment for insufficient physical activity is relatively new. Since parks are accessible venues for physical activity,

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figuring out how to get more people to use them is an important goal and fits in well with environmental approaches to health promotion.

Influencing health behaviors through environmental approaches assumes that people's behavior is dependent on the design and context of their surroundings. The environmental approach tries to understand the characteristics of places and their interaction with individuals to determine how places can be modified in order to automatically optimize specific health behaviors (Farley and Cohen, 2005). The science linking park settings with physical activity is in its infancy and it is unclear exactly which park characteristics and conditions will draw more people to promote greater population-wide physical activity. The conventional wisdom is that parks must be attractive and safe, and have a sufficient diversity of amenities and features to meet the needs of people with multiple different interests (Jacobs, 1961).

The data reported in this paper are compiled from a series of observations of public parks across diverse neighborhoods in a Southern California metropolitan area and surveys of park users and local residents (Cohen et al., 2007). While the data used here are cross-sectional, our goal is to identify key factors that may be associated with park use. Both physical and social characteristics have the potential of influencing park usage. Among the obvious physical factors are park size, the number and type of amenities and physical features, and the population density around the park, since people who live closer to a park are more likely to visit it (Mowen et al., 2007; Grow et al., 2008). Social factors include the number and type of events and programs that are available, the friendliness of park staff, the perceptions of park safety, the demographic characteristics of the populations who live around the park, as well as the history of community involvement in park management. Community involvement is believed to be a critical factor in determining the participation in local programs and activities (Brown, 1985; Minkler et al., 2003). We explored all these possible sources of influence on park usage in order to better tease out factors that can be leveraged to increase physical activity and to assess how park characteristics and demographic factors are associated with park use.

Features of the park system

The park system studied serves a population of about 4 million in temperate year-round weather conditions (Southern California). It has more than 100 recreation centers located within parks with full-time staff. Each recreation center usually has a gymnasium or rooms for indoor activities and classes and a kitchen. The typical park has an outdoor playground area, basketball court, field(s) for baseball and/or soccer, picnic tables, and handball or tennis courts. Each park is also required to establish a volunteer park advisory board (PAB). The PAB is the only formal source of community involvement in park management and its role is to provide local input on programs and policies and to help with special events and fundraising.

Methods

Our study uses data from three principal sources: (1) surveys of park directors, (2) direct observations of park users, and (3) surveys of park users and residents living near the parks.

We asked 51 park directors to complete a questionnaire describing the number of programs their facility offered in the previous 12 months, the number and age group of participants, the extent of community involvement in PABs, the frequency of meetings, and the number of current members.

We used the System of Observing Play and Recreation in Communities (SOPARC) (McKenzie et al., 2006) to count park users at 30 parks throughout all the seasons, 11 in 2006 and 2007 and another 19 in calendar year 2008. We counted users four times per day for each of the 7 days of the week documenting the gender, race/ethnicity, age group, and activity level of all

users and the characteristics of activities in each park area. These methods have been described elsewhere (Cohen et al., 2006; McKenzie et al., 2006). The parks observed in 2008 were selected to be a representative sample of diverse communities across the city, while the parks observed in 2006–2007 were more representative of low-income, minority communities.

We conducted in-person interviews in English and Spanish of a random sample of park users and local residents. Park users were approached systematically and local residents were identified through a random sample of households located within a 1 mile radius of the park. The household sample was stratified in thirds by distance: 1/4 mile, 1/4 to 1/2 mile, and 1/2 to 1 mile buffer around the park. We asked park users and local residents many questions about their use of the park, including, “How often do you come to this park?” and “In general, how safe do you feel this park is?” and “Where do you usually exercise?” In total, we conducted interviews with 2315 park users and 1985 local residents. Using ArcGIS and US Census 2000 block level data, we estimated the socioeconomic and demographic characteristics within a mile radius of each park (US Census, 2000).

Statistical analysis

Our analysis is primarily descriptive. It includes the examination of bivariate associations tested after removing any outliers in order to determine which factors were most correlated with activity level and the numbers using the park. We examined whether neighborhood characteristics and the park and residents' and users' perceptions of safety of the park were associated with park use.

Results

Park characteristics

The 30 parks surveyed were quite heterogeneous (see Table 1). They ranged in size from less than 1 acre to 21 acres (mean=7.4 acres); within a 1-mile radius of the parks the population varied from 8411 to 115,853 (average 38,043 residents/3.14 square miles). The number of people per park acre (counting those within 1 mile of the park) varied from 877 to 50,253 (median = 5163 persons per park acre).

Park Director survey

All 51 Park Directors responded to the questionnaire. The number of park programs reported (e.g., classes, activities, sports leagues) varied from 4 to 15 and the number of annual program participants ranged from 72 to 27,230, with most of the latter attributed to a swimming program. Among the 51 parks, 45 had basketball, 35 had baseball, 34 softball, 28 soccer, 25 tennis, 32 aerobics, 12 gymnastics, and 32 dance programs. Nine of the 13 parks with pools had swimming programs. Overall, 83% of participants in activity programs were children or teens.

All but one park also reported offering programs not directly related to physical activity. The most common of these were snack programs serving a total of 7844 people and offered by 36 parks, followed by arts and crafts, and after school childcare programs. The majority of these nonactivity programs (92%) targeted children and teens.

Only 80% of parks had PABs in place. Reasons for lacking one were typically a recent change in the park director or a gradual reduction of PAB membership, which occurred when the children of board members outgrew available park programs. In other cases, particularly in low-income communities, park directors reportedly could not find local residents who were interested in serving as advisory board members. Almost 40% of PABs participated in fund-raising. On average, they sponsored only one fund-raising event or activity each year, although one PAB sponsored as many as 5 events, including fundraisers.

Park observations

A total of 54,660 individuals were observed with average of 1822 per park (range 226 to 4484) (see Table 1). Of these 61% were male, 39% were female. These users comprised 34% children, 17% teens, 46% adults, and 3% who appeared to be seniors over the age of 60. Activity levels observed were 68% sedentary, 20% walking, and 12% vigorous. Significant seasonal variations were seen: among the parks observed in winter, there was an average of 1484 users per park, in spring, an average of 2120, and in summer an average of 2547. Fall had the fewest users with an average of 1203 per park.

There were a few factors associated with the number of people observed in each park (see Table 2). Park size (acreage) was positively associated with park use ($r=0.37$, $P<0.04$) such that with every 1 acre increase in size, we observed an additional 95 persons. The more organized activities we saw, the larger number of users ($r=0.51$, $P=0.004$), with 58 more users for each additional activity.

Notably, we saw no statistically significant correlation between the number of users and population density of the surrounding neighborhood, existence of a PAB, the percentage of households in poverty, and park users' and residents' perceptions of park safety. In neighborhoods with a higher percentage of Hispanic households, there was a trend for more park users ($r=0.32$, $P=0.09$), while fewer users were observed in neighborhoods with a higher percentage of African American households ($r=-0.36$, $P=0.05$) (Table 2).

Use of park amenities

Based on park observations, gymnasiums and baseball fields were the busiest areas, accounting for 24.6% of all users. Sidewalks, lawns, and play areas were the next three areas with the most people observed. Specific park areas were used differentially by gender. More females were observed in the dance studios (89%), sidewalks (63%), and play areas (58%). Males were more likely to use baseball fields (76%), gymnasiums (63%), and lawns (61%). Mostly males were observed on basketball courts (90%), soccer fields (81%), and tennis courts (80%).

Across all the parks, areas that were most likely to be empty during the 7 days of observations were the volleyball courts, classrooms, and handball courts. Areas most frequently being used were dog parks, walking paths, water features, and multipurpose fields.

Perceptions of safety and reported exercise

Perceptions of safety were lowest in communities with higher population density ($r=-0.39$, $P<0.04$), higher percentage of households in poverty ($r=-0.77$, $P<0.0001$), and higher percentage of Hispanics ($r=-0.78$, $P<0.0001$) (Table 2). Ironically, perceptions of park safety were highest among those who report they usually exercise in health clubs. However, perceptions of safety were not associated with the number of people counted in the parks, the number of programs offered by the park, the existence of a PAB, park acreage, or the number of organized activities observed.

Safety, park acreage, reported programming, and neighborhood racial and ethnic characteristics were not associated with self-reported frequency of exercise among the individuals surveyed. There was a trend for more individuals to be observed in moderate to vigorous activity where people reported more frequent exercise.

Parks with the largest numbers of users

While some parks in neighborhoods with high poverty levels were used infrequently, the five parks most frequently used also had high levels of poverty (average 26%) and high population density (average 44,066 in a 1-mile radius). Park residents' and users' perceptions of safety

were not significantly different among parks most used and those used less often. Two of the most-used parks with fewer organized activities had unique features—one a large lake, multiple walking paths and attractive landscaping, while the other had a water feature. (The park was observed in the summer, accounting for the majority of park activity.)

Discussion

Carrying capacity is a term that signifies the maximum number of people a park can tolerate before it deteriorates, and functional density is a term measuring the optimal number of people in a park to maximize enjoyment (neither too crowded nor too vacant) (Klenosky et al., 2007). These two concepts have not been sufficiently studied in urban neighborhood parks to determine whether parks can adequately function as the venue for most people to obtain recommended physical activity levels. It seems reasonable to expect that a public park should be able to accommodate at least half of all residents within a mile radius to engage in physical activity at least 5 days per week for 15 min—half the recommendation for adults and 18% of that recommended for children. In this sample of parks, in the average park of 7.4 acres serving the average population of 38,000, with each visit evenly distributed across a 12-h day, we would see 1 person per 428 square feet. This number would be 8.7 times higher than we actually observed, suggesting that most parks are underutilized compared to the physical activity needs of the population and park capacity as measured by acreage.

Few factors that we explored explained the large variation in park use across the 30 parks. The observation of organized activities, whether or not they were sponsored by the park itself, appeared to be responsible for attracting the most people, including large numbers of spectators for sporting events. This might explain why the busiest parks had a lower percentage of moderate-to-vigorously active users. While safety has been considered an important barrier to park use (CDC, 1999; Gómez et al., 2004; Molnar et al., 2004; Babey et al., 2005), our study found no correlations between safety perceptions and park use. Many of the parks were perceived as safe by nearly 100% of respondents, but were poorly used. The findings suggest that, at least, perceiving a park as safe may not necessarily facilitate use. Interventions that address park safety alone may have no impact in increasing physical activity in the park, especially where perceptions are already fairly positive.

Limitations

Our study has several limitations. Although we interviewed over 4000 individuals, we observed only 30 parks. This small sample size will allow us to detect only effects that are large. The parks were also assessed in different seasons. Although weather variation is not large, the differences in park use may be partly attributable to differences in the number and types of programs offered seasonally (e.g., softball, soccer, swimming), rather than due to weather. Finally, the reports of park programs are limited to those sponsored by the park, and do not account for other organizations who use the facilities with or without permits. However, our observations did take into account all organized activities occurring during the time periods of our observations, and this factor was the most strongly related to the number of park users.

Conclusion

Investments in park programming and unique park features appear to be associated with higher use. Given that a majority of residents did not participate in park programs, outreach must be a priority. Regardless of budgets, marketing orientation of management has the potential to increase park use (Bright, 2000; Kaczynski, 2008) and previous studies have documented that lack of awareness of park programs is an important barrier to park use (Godbey, 1985; Scott and Jackson, 1996). Furthermore, because parks currently serve a fraction of the local

population, and their limited programs mainly target children, developing programs and activities that will draw adults and entire families is necessary. Greater public support for public parks and programming may be fostered if more services are provided.

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Table 1

Park characteristics and selected survey responses (Southern California, 2006–2008)

Park characteristics	Mean (SD)	Range
Acres	7.31 (4.30)	0.8–21
Population density within 1-mile radius (2000)	38,043 (23,705)	8411–115,853
% Households in poverty within mile radius (1999)	23.8 (13.0)	4.0–54.9%
% Hispanic within 1 mile radius (2000)	49.5 (30.0)	0.5–99.5%
% African American within 1 mile radius (2000)	13.9 (22.0)	0.3–86.4%
Users Observed during 1 week, using SOPARC	1822 (1099)	226–4484
Organized activities observed	13.5 (9.6)	2–38
% users observed in MVPA	33.1 (7.0)	20–47.7%
% perceiving park as safe or very safe	83.4 (14.1)	57.3%–100%
% residents reporting they exercise in the park	29.2 (21.6)	1.6–69.3%
% residents exercise in health clubs	10.7 (7.2)	1.4–29.5%
% residents who report exercising in their leisure time	52.3 (19.2)	17.1–79.7%
No. exercise sessions per week by residents	2.6 (0.94)	1.2–4.1

Table 2

Correlations of park characteristics, observations, and selected survey responses with observed park users; and survey respondents' perceptions of safety and frequency of exercise (Southern California, 2006–2008)

	No. observed park users <i>r</i> (<i>P</i> value)	Perception of safety among residents <i>r</i> (<i>P</i> value)	No. exercise sessions per week among residents <i>r</i> (<i>P</i> value)
Acres	0.37 (<i>P</i> = 0.043)	-0.2 (<i>P</i> = 0.30)	-0.23 (<i>P</i> = 0.24)
1-mile population estimate	0.06 (<i>P</i> = 0.77)	-0.39 (<i>P</i> = 0.039)	0.08 (<i>P</i> = 0.68)
% Households in poverty (1999)	0.06 (<i>P</i> = 0.75)	-0.78 (<i>P</i> < 0.0001)	0.12 (<i>P</i> = 0.52)
% Hispanic	0.32 (<i>P</i> = 0.09)	-0.70 (<i>P</i> < 0.0001)	0.03 (<i>P</i> = 0.87)
% African American	-0.36 (<i>P</i> = 0.05)	-0.01 (<i>P</i> = 0.95)	0.12 (<i>P</i> = 0.55)
% of residents perceiving park as safe or very safe	-0.06 (<i>P</i> = 0.76)	–	0.01 (<i>P</i> = 0.98)
Number park users observed	–	-0.06 (<i>P</i> = 0.76)	-0.24 (<i>P</i> = 0.21)
Number organized activities observed	0.51 (<i>P</i> = 0.004)	0.08 (<i>P</i> = 0.67)	-0.18 (<i>P</i> = 0.34)
% park users observed in MVPA	-0.31 (<i>P</i> = 0.1)	-0.44 (<i>P</i> = 0.016)	0.35 (<i>P</i> = 0.06)
% residents exercise at health clubs	0.08 (<i>P</i> = 0.69)	0.52 (<i>P</i> = 0.004)	0.09 (<i>P</i> = 0.66)
% residents exercise in park	-0.05 (<i>P</i> = 0.79)	-0.21 (<i>P</i> = 0.27)	0.81 (<i>P</i> < 0.0001)
Existence of a park advisory board	-0.02 (<i>P</i> = 0.94)	- 0.03 (<i>P</i> = 0.92)	-0.11 (<i>P</i> = 0.68)