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Are Food Deserts Also Play Deserts?

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ABSTRACT *Although food deserts are areas that lack easy access to food outlets and considered a barrier to a healthy diet and a healthy weight among residents, food deserts typically comprise older urban areas which may have many parks and street configurations that could facilitate more physical activity. However, other conditions may limit the use of available facilities in these areas. This paper assesses the use of parks in two Pittsburgh food desert neighborhoods by using systematic observation. We found that while the local parks were accessible, they were largely underutilized. We surveyed local residents and found that only a minority considered the parks unsafe for use during the day, but a substantial proportion suffered from health limitations that interfered with physical activity. Residents also felt that parks lacked programming and other amenities that could potentially draw more park users. Parks programming and equipment in food desert areas should be addressed to account for local preferences and adjusted to meet the needs and limitations of local residents, especially seniors.*

KEYWORDS *Parks, Physical activity, Food deserts, Health disparities*

INTRODUCTION

Where someone lives is considered an important determinant of health because the ambient conditions can influence not only exposure to toxic substances and hazardous conditions but settings also provide opportunities for healthy behaviors, including easy access to healthy food and places to engage in physical activity. The presence of outlets to obtain fresh fruits and vegetables has been correlated with a healthier diet[1] and access to parks and recreational facilities has been correlated with higher levels of physical activity in cross-sectional studies.[2,3] However, previous studies of park access have often been based upon geographic information systems (GIS), self-report or lacked direct observation of the facilities and amenities available.

Even where consumer products, facilities, and amenities are available, individuals may not take advantage of them. For example, fewer than 2 % of Americans are now estimated to live in places that are more than 1 mile from a supermarket and lack access to a vehicle.[4] Yet, an estimated 97 % of Americans do not meet the USDA Dietary Guidelines for Americans[5] and two out of three adults are overweight or obese.[6] Similarly, although most urban residents live within one half mile of a public park[7], parks are often underutilized.[8–10] Inner cities often have multiple parks and plazas in close proximity to people's homes, yet the presence of facilities alone may be insufficient to encourage people to spend time outdoors.

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Other environmental factors play a role in influencing choices. For example, fear of crime has often been cited as a barrier to the use of local neighborhood parks. Neighborhood poverty levels are correlated with lower park use, as well as with crime rates.[8] A study of parks in New York City documented that parks in low-income areas had more incivilities than parks in higher income areas, suggesting that the park's quality, rather than accessibility, may be a factor in park use.[11] Understanding the degree to which geographic access is a barrier to physical activity versus other factors is critical to informing public policy.

In order to assess the use of parks in two low-income, low-resource, predominantly African-American urban neighborhoods (also designated as food deserts), we conducted systematic observations of all parks and also interviewed neighborhood residents about their physical activity, particularly with respect to their use of local parks. These observations were part of a larger study capitalizing on a natural experiment of a neighborhood undergoing greenspace and housing renovations; the study is examining the impact of transformations on residents' active transport and physical activity. All observations and interviews were part of the baseline data collection (i.e., "pre-change" to the greenspace improvements).

METHODS

We observed all of the 19 publicly-accessible parks and playgrounds in Pittsburgh's Hill District and Homewood neighborhoods from August to October 2012 using the System for Observing Play and Recreation in Communities (SOPARC),[12] a validated method using momentary time sampling to assess the characteristics of parks and their users, including their physical activity levels. We mapped each park, dividing it into distinct target areas. Field staff systematically rotated through all target areas in each of the parks and playgrounds on Tuesdays, Thursdays, Saturdays, and Sundays, 4 scans a day, for a total of 16 scans at each location. Park scans were expected to last up to 1 h. If the scan took less than 30 min, data collectors were instructed to complete a second scan during that hour. Eight community-based data collectors were trained in the SOPARC methodology. All eight data collectors completed approximately 35 h of training, which included classroom training as well as field-based practice. Data collectors were tested and certified at the end of the training period before they were allowed to begin fieldwork.

Data collectors observed the parks and playgrounds in pairs. The field coordinator conducted at least four reliability checks for each location, where she conducted an observation alongside the data collection team. In the event of rain or other inclement weather, scheduled observations were canceled and rescheduled for the same time and day of the week. Field staff also observed the appearance of parks and documented incivilities like litter, graffiti, and evidence of vandalism.

Comparison data were obtained from the National Study of Neighborhood Parks where data were collected in the spring and summer of 2014 from a random sample of parks in a representative sample of cities greater than 100,000 population.[13] Pittsburgh was included in the national sample, but none of the food desert parks were selected from the 67 eligible Pittsburgh neighborhood parks.

We estimated the weekly use of each park by multiplying the average hourly use for weekdays by 55 and adding the average weekend hourly use by 22, essentially considering use for 11 h/day 7 days per week, as these are the time frames during which the observations were made.

Staff also interviewed local residents about their use of the parks. Households were enrolled into the current study as part of a larger suite of studies following the same randomly selected cohort of residents over time. For the current study, data collectors administered an extensive interview on park use, active transportation, exercise, and other sociodemographic factors. The households were originally selected from a stratified random sample of 2900 addresses zoned as residential from a list of addresses obtained after merging Allegheny County Office of Property Investment data with the Pittsburgh Neighborhood and Community Information System (PNCIS). Of the 1514 resulting addresses, we were able to contact 1259 (83 %) of them. We found 1190 of these homes eligible for participation, and 1015 (88 %) households completed the survey with an incentive.

Eligibility for enrollment into the study required that the household member be the main food shopper. In addition to multiple questions about food, participants were asked where they go most often for physical activity, whether they visit various parks in their neighborhood (and how often), what they do at the parks, and their opinions of park accessibility. Participants were also weighed and had their height measured by the interviewers.

RESULTS

There were a total of 95.9 acres of parks in the two neighborhoods for a total of 18,620 residents or 5.2 acres/1000 population, compared to the overall city average of 10.2 acres/1000 for Pittsburgh.[14] However, the calculation for the city includes some very large parks, including one over 600 acres that inflates the accessible park acreage (NYC and Chicago have 4.6 acres/1000 population).[14] Compared to eight parks that were randomly selected from all neighborhood parks between two and 20 acres in Pittsburgh, the 11 parks larger than 2 acres in the food desert neighborhoods had fewer facilities and amenities, including overall fewer play areas with equipment like swings and monkey bars, and a considerable deficit in sports fields, even among parks that apparently had the necessary acreage for such fields (See Table 1).

Of the total 19 parks observed in the food desert neighborhoods, across 6825 observations of 290 target areas over 4–8 days per park, target areas were empty 92 % of the time versus 74 % in a nationally representative survey of neighborhood parks and 84 % in other Pittsburgh neighborhoods (Table 2). The users comprised 69 % children and teens, 30 % adult and 2 % seniors, while population composition of the neighborhoods is 30.2 % children and teens ages 0–19, 56.4 % adults 20–64, and 18.5 % seniors 65 and older.[15] Among park users, 70 % were male and 30 % female. Among park users, 58 % were sedentary, 22 % were in moderate physical activity, and 20 % engaged in vigorous activity. We estimated that on a typical week, the average food desert park over 2 acres received 599 person-visits. This compares with an average of 1533 person-visits nationally and 1112 person in non-food desert Pittsburgh parks. Parks less than 2 acres received an estimated average of 196 person-visits (range 22–395).

Of the 6825 observations, supervised or organized activities were observed 62 times—fewer than 1 % of all observations. This compares to 4 % in the national sample. Moderate to a lot of litter was observed in 25 % of all observations, less than the 32 % nationally. Graffiti was more likely to be seen in the smaller parks than those with less than 2 acres (12.5 % versus 9 %). All the target areas in all the parks were rated as usable. Other incivilities like broken glass, vandalism, and signs

TABLE 1 Descriptives of parks in food desert neighborhoods

	Acres	# of supervised activities observed (over enter week)	Total users observed	Playground	Basketball courts	Multi-purpose field	Other facilities
Neighborhood parks							
Ammons	8.8	0	75	No	No	No	Yes
Baxter	2.8	4	42	Yes	No	No	Yes
Chadwick	6.8	11	493	Yes	Yes	No	Yes
Cliffside	3.9	0	3	Yes	Yes	No	No
Kennard	13.4	17	471	Yes	Yes	No	Yes
MLK	3.5	0	0	No	No	No	Yes
Robert Williams	12.3	3	38	Yes	Yes	No	Yes
Westinghouse	10.8	4	257	Yes	Yes	No	No
WestPennRec	23.3	2	143	Yes	Yes	Yes	Yes
Willie Stargell	2.7	6	147	No	No	No	Yes
Kaboom	2.9	0	47	Yes	No	No	No
Mini-parks < 2 acres							
Bentley	0.2	0	5	No	Yes	No	No
Dallas	0.4	12	58	Yes	Yes	No	No
Graham	0.3	0	8	Yes	No	No	No
Granville	0.6	0	74	Yes	Yes	No	Yes
JuneBug	0.2	2	39	No	No	No	Yes
Larimer	1.1	0	67	Yes	Yes	No	Yes
Wilkinsburg	0.3	0	17	Yes	No	No	No
Vincennes	1.6	0	42	Yes	Yes	No	No

TABLE 2 Comparison of neighborhood parks: national, Pittsburgh versus food desert parks

	National neighborhood parks > 2 acres	Pittsburgh representative sample	Food desert neighborhood parks > 2 acres	Food desert mini-parks < 2 acres
	N = 174	*N* = 8	*N* = 11	*N* = 8
Average acres	8.8	9.6	8.3	0.7
Population density	4979	5246	6603	6603
Average estimated weekly users *per park*	1533	1112	599	196
% male	57	53	69.0	72.6
% female	43	47	31.0	27.4
% children of all users in parks	38	42.7	39.5	49.3
% teens	13	18	25.5	22.3
% adults	44	36.9	32.5	27.1
% seniors	4 %	2.4 %	2.5 %	1.3 %
% with playgrounds	88	100	73	75
% with basketball/other courts	59	100	55	63
% with multipurpose field (including baseball)	71	100	9	0
Litter (moderate to a lot) (%)	32	25	27	25
Graffiti (moderate to a lot) (%)	7.5	0	9	12.5
% Target areas rated as usable	97	99.4	100	100
% of observations with supervised activities	2.4	2.7	1.2	1.4
% organized activities	2.8	1.2	1.2	1.1
% of target areas that were empty	74.3	84.2	92	92

of alcohol and drug use were relatively uncommon. In no park were any of these rated as more than some, and the average was close to none to a little.

HOUSEHOLD INTERVIEW RESPONSES

Compared to the population characterized by the US Census, household respondents who were the main food shoppers much more likely to be female, older, and only 37 % reported working full or part time, versus 60 % for all local residents. In our sample, more than 63 % were retired or not working (Table 3).

Many of the respondents suffered from significant health problems: 29 % reported they could not walk a single block and 49 % reported could not walk several blocks or climb a flight a stairs without difficulty; 75 % said they could not engage in vigorous activity (Table 4).

Only 6 % said they usually exercise in the park although 76 % disagreed that it was difficult for them to get to the park. Nearly 21 % said they attended a physical activity class in the past 6 months.

TABLE 3 Characteristics of neighborhood respondents

Respondents $n = 1051$	Respondents (%)	ACS 2012[a] (%)
Male	22.8	44.7
Female	77.2	55.3
Age (18+)		
18–25	5.2	22.5
26–40	15.3	17.7
41–55	28.9	23.9
56–70	30.8	20.0
71+	19.7	15.8
African American	94.3	87.3
Have children <18 at home	27.6	22.1[b]
Marital status		
Married/living with partner	20.2	16.1
Widowed/divorced/separated	41.1	29.8
Never married	38.7	54.0
Employment		
Full-time	23.3	39.6[c]
Part-time	13.4	20.6
Not working (retired, disabled, looking for work, volunteer, student)	63.2	39.8
BMI		
Underweight/normal (<25 kg/m^2)	22.2	–
Overweight (25 kg/m^2–<30 kg/m^2)	27.8	–
Obese (30 kg/m^2 +)	50.0	–

[a]*From American Community Survey 5-year data (2008–2012) for the Hill District neighborhoods (census tracts 305, 501,506, 509, 510, and 511) and Homewood neighborhoods (census tracts 1204, 1207, 1208, 1301, 1302, 1303, and 1304)

[b]Percentage is based on households not population, ACS 2012 5-year estimate

[c]Population 16 to 64, ACS 2012 5-year estimate

While 86 % said they felt safe walking in their neighborhood during the day, 31 % found it unpleasant to walk on the streets and 26 % considered the park closest to their home as unsafe, primarily due to violence (16 %) and/or drugs (11 %). Another 8 % said poor maintenance of the park was also a concern. Many of the respondents indicated they would like to see improvements in the local parks. 41 % wanted walking paths, 41 % outdoor fitness classes, 44 % events and fairs, 42 % concerts, 39 % more lighting, 33 % arts activities, 27 % adult sports leagues and 31 % a garden area.

DISCUSSION

Although multiple parks were available and accessible in these food desert neighborhoods, our study documented that the parks were mostly empty with their use significantly lower than other parks both locally and nationally. As a consequence, these neighborhoods could rightly be deemed “play deserts”. Few

TABLE 4 Survey responses relating to physical activity and park perceptions

	$n = 1051$ (%)
Health limits walking one block a little/a lot	28.8
Health limits walking several blocks a little/a lot	48.9
Health limits doing vigorous activities a little/a lot	75.0
Health limits climbing one flight of stairs a little/a lot	39.2
Location of physical activity in past month	
Park	6.0
Trail/Path	13.4
Gym/Recreation Center/Exercise class	15.0
Home	20.4
Other	31.5
No physical activity	13.7
Disagree or strongly disagree that parks/playgrounds in the neighborhood are difficult to get to	76.0
Attended a physical activity class in past 6 months	20.8
I feel safe walking during the day (agree or strongly agree)	85.7
It is unpleasant to walk on the streets due to street traffic (agree or strongly agree)	30.7
Park closest to your home is unsafe or very unsafe	26.1
Reasons closest park is not safe (respondents could choose multiple reasons)	
Violence	16.2
Using/Selling drugs	11.4
Loitering	9.4
Poor maintenance	8.1 %
Poor lighting	6.8
Too secluded	3.3
Other	3.0
Too crowded	2.5
Additional amenities/programs respondents would like to see (respondents could make multiple choices)	
Park events/fairs	44.0
Park concerts	42.3
Outdoor fitness classes	41.2
Walking paths	40.8
Lighting	38.8
Playground equipment	33.9
Arts activities	33.0
Garden area	30.8
Adult dance classes	29.5
Adult sport leagues	27.4
Quiet spaces	27.1
Youth sport leagues	26.7
Bicycle paths	26.6
Organized adventure walks	25.2
More trees	23.0
Environment activities	16.4

people were observed using the facilities, even though the facilities were in fairly good condition and rated as usable.

Like other parks in low-income neighborhoods, we saw few organized or supervised activities. In some cases, this may be an indication of the lack of resources and/or ability of the city to invest in staff and programming and a policy of "pay to play". In higher income area parks, organized activities may be offered, but participants might have to pay fees to cover the costs. Furthermore, parks in food desert neighborhoods lacked the multi-purpose fields necessary for organized sports. These fields draw not just players, but families and other spectators, and offer a reason for many to come out and engage in active transport just to see the competitions and associated events.

We also noted a significant gender disparity in the use of food desert parks, with substantially more males than females. This could be a reflection of the perception that parks may not be safe, but could also indicate the lack of programming, facilities, and activities targeted to females, who often participate in group activities like aerobics, Zumba, and other dance, rather than pickup games of basketball or soccer, favored by males.

Although the household population surveyed was not a representative sample for the entire population because of a high percentage of older females, the households were geographically representative of the neighborhoods. Yet, the individuals appeared to be disproportionately disabled and limited in their physical activity. This could partly explain why so few seniors and adults were observed in the parks. Nationally, seniors are also underrepresented in public parks, but the difference for adults was considerably greater in Pittsburgh. As a result, children and teens, especially males, are over-represented, and in particular, we observed disproportionately more teens in these parks.

It would be hard to argue that neighborhoods in food deserts require more parks, when existing parks are largely unused. However, these parks do have fewer facilities and lack programming, which is known to attract park users.[8,16] Because it appears that a considerable percentage of the population in these neighborhoods suffer from disabilities, it would be important to consider installing special facilities like universally accessible inter-generational playgrounds. Programming should be provided and tailored for local needs, such as low-impact aerobic exercises and other classes for the elderly. Although we did not assess the neighborhood streets and whether they comply with ADA requirements, care should be taken to ensure that the sidewalks have curb cuts and are not hazardous to the elderly and the disabled.

Although some residents voiced concern about crime—violence and drugs, the overwhelming majority 86 % considered the areas to be safe in the daylight hours. And, large numbers of residents were interested in the development of new facilities like walking paths as well as programming that would increase their use of the park. It is possible that small investments in park renovations and programming could make a substantial impact on population physical activity and health. Most parks are designed generically, but given different local needs, park administrators should do their utmost to ensure that park resources are not wasted and can truly serve the residents for whom they are intended.

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