

PERSONAL BENEFITS OF PUBLIC OPEN SPACE: A CASE STUDY IN BOSTON'S ARNOLD ARBORETUM ^{1/}

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Abstract: Managers of urban parks need to document the benefits that their parks produce. Use level is a typical measure of such benefits, but simple use statistics can mask the rich diversity of people and activities that the parks serve. This study examined the uses and users of Boston's Arnold Arboretum during late summer in 1992. On 25 sample days, we recorded observations on 3,983 individuals engaged in 98 different activities. The highest use levels were recorded on sunny afternoons, particularly on weekends; the most common activities were strolling, conversing, looking at something, and cycling. The incidence of problem behavior was slight. These activities represent the personal benefits produced by the Arboretum in that they accrue directly to the individuals involved. Additional research is needed on the social benefits of urban parks that accrue to institutions throughout the community.

Introduction

Urban parks are among the nation's foremost recreation resources, providing services to millions of Americans each day. Regrettably, many once great city parks have deteriorated; in times of fiscal austerity, parks tend to be bypassed in favor of other city services. Nationwide, the result is a huge backlog of deferred maintenance, vandalized facilities, and ineffective service--circumstances that can lead to even further declines (Whyte 1980). To counter this situation, park managers must be able to document the benefits that urban parks produce. Such documentation could help parks departments achieve parity with other city departments in the competitive world of municipal finance.

The general topic of recreation benefits has received much attention during the past two decades and numerous

studies have examined the effects of activity participation on benefit measures ranging from the physiological to the psychological to the economic (see review by Driver et al. 1991). This paradigm works well for many forms of recreation, particularly in more remote settings where there is uniformity in both the activities undertaken and the population served. In the city, though, things are different. Cities provide space, and a highly diverse population makes what use of it they will. For example, More (1985) examined two central city parks during July and August and found users engaged in 156 different activities. The amount and nature of use varied with the time of day and the characteristics of the landscape. In a study of trail use in Chicago's Warren Park, Gobster (1991) found that 51.2% of the users engaged in strolling as their primary activity, while the remainder were engaged in a variety of activities ranging from sitting (13.9%) to bicycling (9.2%) to free play (2.3%). In addition, 73.3% of all users engaged in a secondary activity such as walking a dog (8%), conversing (6.5%), or listening to the radio (1.7%). In a study of four parks in the Los Angeles area, each frequented by a different ethnic group, Loukaiton-Sideris (1995) found that stationary activities (watching children play, watching sports, picnicking, sitting/relaxing) were the most common in all parks, followed by mobile activities (walking, jogging, bicycling) and sports activities. These studies indicate how difficult it is to document the benefits of urban parks at a highly detailed level. For example, a jogger receives an entirely different set of benefits than a mother who is watching her child play, yet both sets of benefits may be attributable to the same park. Moreover, parks provide a variety of other benefits that can be biological or social in nature--they modify microclimates, reduce air pollution, absorb runoff of surface water, stimulate economic development, and provide settings for community and civic events. All of these benefits must be included in any comprehensive assessment of urban parks. Yet the most obvious starting point continues to be documenting the multitude of ways in which people use urban parks. In this study we examined the late summer use of the Arnold Arboretum, a 265-acre reserve that is a key component of Boston's "emerald necklace."

Methods

Designed by Frederick Law Olmstead in the 1870's, the Arnold Arboretum is a natural area located in the Jamaica Plain section of Boston. It is administered jointly by Harvard University and Boston's Department of Parks and Recreation. As such, the area is both a major scientific resource--maintaining a vast collection of trees, shrubs, and vegetation from throughout the world--and a major recreational resource for the people of Boston. It contains a variety of landscapes ranging from intensely cultivated areas with lawns and beautifully arranged flowering shrubs to marshes, streams, and hills covered with naturally occurring oak and hemlock. A small section of the Arboretum houses a unique collection of Bonsai trees and Japanese gardens.

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The Arboretum is readily accessible to most city residents by car or mass transit. Although it is entirely fenced, access is available from multiple points. At the main entrance, a visitor center provides information and includes educational exhibits and a small gift shop.

Visitors move through the Arboretum on a series of paved roads and paths. General access to these roads is restricted, so most people walk or ride bicycles, though it is possible to make special arrangements to drive. The Arboretum also operates a series of tours via a small bus.

To systematically inventory the late summer recreational use of the Arboretum, we followed procedures outlined in More (1985). This entailed having two trained observers follow a fixed route throughout the area on selected sample days between August 1 and September 15, 1992. To establish the sample days, the week was divided into weekdays and weekend days, with holidays treated as weekend days. The total sample consisted of 17 randomly selected weekdays and 8 weekend days, 55 and 53% of their respective categories. On each sample date, observations were made in the morning (beginning at 9 a.m.) and in the afternoon (beginning at 1 p.m.).

In making the observations, the Arboretum was divided into 21 sectors following roads and paths. The entire area was covered and a fixed walking route was established to allow the observers to cover all parts of each sector. On each sample date, an observer chose a starting point (a major access point) at random and flipped a coin to determine the travel direction (forward or backward). The observer then followed the fixed route until an entire circuit was completed. On average, it took 2-1/2 hours to walk the route; observations were made on all sample dates, regardless of weather.

As the observer encountered Arboretum users, he or she recorded their ages, genders, the number in their group, their location (on road or path, or off road or path), and as many as five behaviors per individual. Multiple behaviors were recorded because some activities are compatible; for example, a couple strolling hand in hand and talking would have been recorded as strolling, talking, and engaging in affectionate behavior--a total of three activities. When an inventory of all users within a sector was completed, the observer moved to the next sector until a complete circuit of the Arboretum was completed. When data collection was completed, observations had been obtained on 3,983 individuals. Since the study was considered exploratory, the data were simply tabulated rather than being subjected to a comprehensive statistical analysis.

Results

The Arnold Arboretum tends to attract heavy recreation use. We observed an average of 122 visitors on weekdays and 319 on weekend days. Moreover, late summer is a time of year when park use generally declines (cf. More 1989; Gobster 1991). Highest use generally tends to be in the spring and early summer. Use was heaviest on Sundays and most visitors (67%) arrived in the afternoon or on sunny days (Table 1).

Table 1--Visitation by time of day and weather

Time and weather	Frequency	Percent
Morning	1,301	32.7
Afternoon	<u>2,682</u>	<u>67.3</u>
Total	3,983	100.0
Sunny	3,137	78.8
Cloudy	740	18.6
Rainy	<u>106</u>	<u>2.7</u>
Total	3,983	100.0

Park use was distributed unevenly across the sectors; the visitor center and adjacent areas attracting the greatest use. Most visitors (69%) remained on the roads and paths. Socially, users tended to be alone (48%) or in couples (33%); the largest group observed was 65. Nearly 95% of all users were in groups of four or fewer. Approximately 61% were adults between the ages of 20 and 40, while 19% were preteens (Table 2). Both genders were nearly equally represented (51% male vs. 49% female), so even a gender distribution is unusual (More 1985; Westover 1988) in American parks. These percentages are a testament to how comfortable women feel visiting the Arboretum. With respect to race, 83% of the Arboretum users were Caucasian, 10% were African-American, and 8% were other non-Caucasian (Table 3).

Table 2--Ages of visitors

Age category	Frequency	Percent
Infant	123	3.1
Child	735	18.7
Teen	143	3.6
Younger adult (20-39)	2,406	61.3
Older adult (40-60)	306	7.7
Senior	<u>216</u>	<u>5.5</u>
Total	3,925	99.9

Behaviorally, we observed users engaging in 98 different activities. We grouped individual activities into 12 major categories plus a miscellaneous category (Table 4).

Table 3--Race of visitors

Race	Frequency	Percent
Caucasian	3,188	82.6
African-American	375	9.7
Hispanic	142	3.7
Asiatic	138	3.6
Eastern Indian	<u>15</u>	<u>0.4</u>
Total	3,858	100.0

The most common activities were walking (40.5% of the total), particularly strolling, and conversing (17.5%). Other common activities included looking at something (9.5%), cycling (6.9%), sitting (6.0%), and playing (5.5%) (Table 5).

Table 4--Behavior categories as a percentage of total behavior

Behavior category	Number	Percent
Walking behavior	2,659	40.5
Conversing	1,157	17.6
Looking behavior	622	9.5
Cycling	452	6.9
Sitting	397	6.0
Play behavior	364	5.5
Eating/drinking	188	2.9
Affectionate behavior	143	2.2
Exercise	138	2.1
Reading/writing	105	1.6
Resting/sunning	77	1.2
Photography	40	0.6
Miscellaneous	221	3.4
Total	6,563	100.0

Particularly noteworthy is the relative absence of what might be termed "problem behavior." Table 5 includes several activities that might be considered questionable, for example, walking dogs off leash (n=393), climbing trees (n=46), picking flowers and vegetation (n=15), drinking alcohol (n=4), and arguing (n=4). Together, these accounted for 7.0% of all observed behavior, most of which is attributable to unleashed dogs. However, it may be that our data underestimate such activity somewhat; for example, littering takes only an instant and may be underrecorded with observational techniques, and other problem activities may be more furtive in nature and not easily observed. Nevertheless, the large numbers of women and children who visit the Arboretum, along with our own data and observations, suggests that neither safety nor problem behavior (with the possible exception of unleashed dogs) is a concern.

Discussion and Conclusion

These data need to be interpreted cautiously. Our goal was to specify what a particular person was doing in the Arboretum at the time when we observed him or her, but there are inherent problems with behavioral observation. We have noted the problem of multiple activities, and measurement reliability--the extent to which two observers agree--is somewhat less for behavior than for variables like gender or age (More 1985). The larger categories of Table 5 also are somewhat arbitrary, for example, should singing be placed in the category of "conversing" or under "miscellaneous?"

Perhaps even more serious are what the data fail to reveal. For example, we have no indication of visit duration--some people spend only a few minutes in the Arboretum, while others stay all day and engage in multiple activities. Similarly, the behavioral data give us no indication of the intensity with which some people use the Arboretum. While many are infrequent visitors, others visit daily, frequently occupying the same bench at the same time and displaying a level of commitment to the area that is not apparent from our data. Finally, the behavioral data give us

no idea about people's mental state--what they are thinking. For example, some users might value the Arboretum for its tranquility and solitude. However, we do not know this from our data; all we can record is someone sitting on a bench or strolling alone through the woods.

These problems notwithstanding, our behavioral data provide a rich source of information about the Arboretum and the purposes it serves for its users. Strolling and talking, getting exercise, enjoying the beauty of the area, or simply sitting in the grass are common among the 98 activities we observed. People came to eat lunch, hold hands, or watch their children make discoveries under rocks or in the eddy of a quiet brook. They birdwatched, posed for photographs, and read books, newspapers, and magazines. Their purposes were as rich and varied as the complex city that surrounded them. However, we need to turn to the question we raised in the introduction: how can we go from these rich data to a deeper understanding of the benefits that the Arboretum and other urban parks like it provide city residents?

Clearly, quantity of use is one major criterion for benefit; it has been the typical measure of the success of most parks and plazas (cf. Gold 1972; Hatry and Dunn 1971; More 1990; Whyte 1980). However, the diversity of use and users may be another important criterion. For example, city parks departments often attempt to achieve high use by providing structured facilities and programming around them. Yet, while ball diamonds, soccer fields, and the like may help fulfill this goal, they also may serve a limited clientele. When coupled with high use levels, the diversity of users and uses that we observed in the Arboretum suggests a park that offers a broad spectrum of benefits for community residents. Such service diversity deserves greater attention as a criterion for success.

We also need to be doing more conceptual work on the benefits of urban parks in general. Typically, recreation activities like camping, hiking, and hunting can be analyzed for the various benefits they offer participants (cf. Driver et al. 1991). But this is impractical when dealing with 98 different activities. Instead, we suggest a tripartite classification of the benefits of urban parks. First, urban parks offer their users personal benefits in that they accrue directly to individuals who use the area. This is the kind of benefit with which we have been primarily concerned in this study. Second, urban parks produce a variety of biophysical benefits. As noted, parks contribute to the functions of city ecosystems: they modify temperatures and microclimates, reduce air and noise pollution, and absorb water. Such benefits ultimately accrue to people, but they do so indirectly through the improvement of ecosystem functioning rather than through direct use. Third, urban parks produce an important set of social benefits. These are benefits that accrue to community institutions rather than to individuals. For example, the Arboretum is booked well in advance for Easter sunrise services. While the

Table 5 Behavior of Arboretum Users

Behavior	Number	Percent	Behavior	Number	Percent	Behavior	Number	Percent
<i>Walking Behavior</i>			<i>Play Behavior</i>			<i>Reading/Writing</i>		
strolling	1733	65.2	children's' games	131	34.5	reading book	43	41.0
walking dog off leash	393	14.8	roller-skatingblading	50	13.2	reading sign	33	31.4
walking with child	138	5.2	climbing trees	46	12.1	reading newspaper	17	16.2
in stroller	109	4.1	playing with ball	38	10.0	reading map	6	5.7
walking dog on leash	84	3.2	Frisbee	19	5.0	writing	4	3.8
walking with something ^{a/}	83	3.1	with dogs	19	5.0	reading magazine	2	1.9
walking purposively	61	2.3	tricycling	16	4.2	Total	105	100.0
being carried	35	1.3	baseball	15	3.9			
running	10	0.4	with toddler	13	3.4	<i>Resting/Sunning</i>		
wheelchair	7	0.3	with sticks	9	2.4	resting	38	49.4
running purposive;y	6	0.2	in water	7	1.8	sunbathing	23	29.9
Total	2659	100.0	with plants	6	1.6	sleeping	16	20.8
			on rocks	3	0.8	Total	77	100.1
<i>Conversing</i>			catch	3	0.8			
talk to others	1057	91.4	with sprinkler	1	0.3	<i>Photography</i>		
listen to others	67	5.6	with wagon	1	0.3	wedding pictures	19	47.5
talk to wildlife	25	2.2	with fountain	1	0.3	being photographed	7	17.5
arguing	5	0.4	skateboarding	1	0.3	photographing something	4	10.0
yelling	2	0.2	digging	1	0.3	photographing flowers	4	10.0
talk to self	1	0.1	Total	380	100.2	photographing people	4	10.0
Total	1157	99.9				photographing view	1	2.5
			<i>Eating/Drinking Behavior</i>			videotaping	1	2.5
<i>Looking Behavior</i>			snack	86	45.7	Total	40	100.0
looking at trees	282	45.3	picnic	72	38.3			
looking at view	198	31.8	drinking from fountain	24	12.8	<i>Sitting</i>		
looking at animals	43	6.9	drinking alcohol	4	2.1	on bench	192	48.4
looking at pond	39	6.3	carrying food	2	1.1	on ground	188	47.4
looking at plants	23	3.7	Total	188	100.0	on lawn chair	17	4.3
looking at other people	21	3.4				Total	397	100.1
looking at child	9	1.4	<i>Affectionate Behavior</i>					
looking at flower	7	1.1	hand-in-hand	124	86.7	<i>Miscellaneous</i>		
Total	622	99.9	embracing	19	13.3	organized group	94	42.5
			Total	143	100.0	listening to radio	56	25.3
<i>Cycling Behavior</i>						driving in car	21	9.5
Cycling	416	95.4	<i>Exercise</i>			pick flowers/vegetation	15	6.8
teach child to ride bike	8	1.8	jogging	110	79.7	singing	10	4.5
learning to ride bike	6	1.4	speed walking	16	11.6	crying	7	3.2
child in bike seat	5	1.1	roller skating	6	4.3	painting	5	2.3
repairing bike	1	0.2	exercising	5	3.6	changing diaper	5	2.3
Total	436	99.9	gymnastics	1	0.7	picking up	3	1.4
			Total	138	99.9	lost	2	0.9
						planting trees	2	0.9
						using metal detector	1	0.4
						Total	221	100.0

^{a/} Includes objects such as binoculars, cameras, books, food, etc.

individual participants undoubtedly benefit from participation, there also is a "corporate" benefit that accrues to the church that offers the service. Thus, we need to understand how urban parks benefit various community social systems including business/commerce, government, health, religion, education, and community service organizations. Bluestone (1991) made it clear that the founders of Chicago were anxious to develop parks (in addition to other forms of civic ornamentation) as a means to attract investment. Such social benefits accrue when parks contribute to the functioning of civic systems and community institutions.

In sum, this study revealed both high use levels and great diversity of use in Boston's Arnold Arboretum during late summer of 1992. Although the typical user was a strolling/talking Caucasian adult aged 20 to 39, it would be misleading to place any emphasis on the "typical user" because of the Arboretum's many different uses. Future studies need to focus on documenting the variety of benefits produced by urban parks; the "personal" benefits examined in this study represent only one category of such benefits.

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