Unleashing Physical Activity: An Observational Study of Park Use, Dog Walking, and Physical Activity

Viviene Temple, Ryan Rhodes, and Joan Wharf Higgins

Background: Walking has been identified as a low resourced yet effective means of achieving physical activity levels required for optimal health. From studies conducted around the world, we know that dog owners walk more than nondog owners. However, this evidence is largely self-reported which may not accurately reflect dog-owners’ behaviors. Method: To address this concern, we systematically observed the use of 6 different public parks in Victoria, British Columbia during fair and inclement weather. Using a modified version of the SOPARC tool, we documented visitors’ types of physical activity, and the presence or absence of dogs. The Physical Activity Resource Assessment was used to consider park features, amenities, and incivilities. Results: More people without dogs (73%) visited the parks than those with dogs (27%), largely because of attendance at the multiuse sport parks during the summer months. Despite the opportunities to engage in multiple sports, most people used the parks to walk. However, when inclement weather struck, dog owners continued visiting parks and sustained their walking practices significantly more than nondog owners. Conclusion: Our observational snapshot of park use supports earlier work that dogs serve as a motivational support for their owners’ walking practices through fair and foul weather.

Keywords: community-based research, environment, health behavior

Even with mounting evidence of the health benefits of moderate physical activity, including moderate walking,1,2 it has been estimated that well over 30% of North American adults are overweight.3 Indeed, one recent calculation predicts a stay in life expectancy gains of 0.71 fewer life-years through 2020 because of the rise in obesity.4 Yet, physical inactivity remains a population-wide plague around the world: According to the World Health Organization, 60% of the world’s population are insufficiently active to reap health benefits.5 In the U.S. fewer than 5% of adults were found to meet national physical activity recommendations, as measured with accelerometers.6 Canadians fare better, though almost half admit to not meeting Public Health Agency of Canada guidelines,7 and this was recently confirmed through objective measures of fitness.8 Studies investigating the physical features of public spaces most conducive to physical activity,9,10 have begun to address dog walking.11 In parallel, the vogue in health promotion research has recently turned the attention toward dog walkers/owners, and the potential for dogs to act as motivators and supports for people to engage in moderate physical activity through daily walking.12-15 Although promising, this line of inquiry has relied on self-report data from dog owners and nondog owners.11,12 The purpose of this paper is to describe an observational study documenting dog owners and nondog owners’ use of public parks in fair and poor weather. The paper opens with a brief review of the use of parks for physical activity, followed by a more extensive summary of the research on dogs and physical activity, and summary of physical activity and weather to present the case for the purpose and methodology of the study.

Parks and Physical Activity

Inquiry into the influence of public and open green spaces, such as parks, on health and well-being has recently reemerged,16-20 notwithstanding its historical beginnings as part of public planning.21 The salutary effects of parks and natural spaces have been identified as many; most notably for our purposes, parks represent a free and open resource for physical activity that is open to all citizens, all day, everyday,16,17,19,23 particularly for urban dwellers who may have less access to rural or countryside space.24

While the research is inconsistent, “overall, there is some evidence to suggest that improving access to green space in urban areas could provide public health benefits by encouraging greater participation in physical activity.”25 For example, in Australia, researchers have demonstrated a positive association between access to parks and paths, and walking.26,27 An observational study of neighborhood parks found that moderate to vigorous physical activity levels and higher energy expenditure...
were generated by the use of soccer fields and playgrounds and by basketball, tennis/racquetball, and volleyball courts. Dog play areas, picnic shelters, and fishing piers were associated with the lowest energy expenditure. In all parks, walking behavior was greater than vigorous activity. In an ethnographic account of human and dog interactions in British public parks, Laurier, Maze and Lunding concluded that dogs served as good walking companions for their owners. Indeed, ‘Park Life’ survey evidence from Britain demonstrates that many residents visit parks specifically for the purpose of walking their dog.

**Dogs and Physical Activity**

Despite a comparatively large evidence base on the salutary mental and physical benefits of dog ownership (see for example reviews by Walsh), there is less available to suggest that dogs can serve as daily prompts for their owners’ walking behaviors. What we do know from cross sectional and longitudinal research is that dog owners are more active than nondog owners, and about half of all dog owners are physically active with their dog. When documenting dogs’ physical activity levels, Robertson found that 77% of dogs had been taken out for exercise in the last week and only 12% of dogs were exercised in their own backyards. When correlated with the amount of walking per week reported by dog owners, this suggests that most dogs are exercised outside of their home and yard. Across the U.S., Ham and Epping found that, among those who walked their dogs, 80.2% engaged in 1 or more walks of at least 10 minutes in 1 day. Most recently, when examining the effect of acquiring a dog on walking practices of Australian adults, recreational walking was found to increase to 31 minutes/week among new dog owners. This latter study provides important evidence for directionality—the dog changed walking behavior of its owner, and helps to respond to the reasonable speculation that the dog-physical activity relationship may be simply from walkers who choose to own dogs.

Dog walking has been recognized as one of the world’s most popular recreational activities. It seems, then, that dogs and their natural inclination and need for movement serve as important stimulators for their owners to engage in physical activity, but why? From their analyses, Ham and Epping concluded that dog walking may support and motivate physical activity by providing companionship and creating expectations for care. This was confirmed in a cross sectional study when dog owners’ sense of obligation toward exercising their dog predicted dog walking independent of their intent, and explained considerable variance in walking. Indeed, it was found that dog owners walked less and were less physically active than nondog owners once dog walking was removed from the analysis. Consistent with the concept of microcontextual factors in behavior-setting theory “where and with whom a person is located” influences “within-daily decisions” of health behaviors, an explanation proffered is that dogs serve as a form of social support or as an impetus for walking, whereas this is not the case for other types of pets. This suggests that when dog owners choose to participate in activities, they are selecting to be active with their dogs, in what has been described as similar to a human buddy system. In the veterinary medicine literature, there seems to be confirming evidence of the importance of the human-canine relationship for dog health. Those who are self-conscious about the health of their pets own dogs of normal weight.

To date, this literature does not include systematic observation of activity levels among dog owners. The observational studies of dogs accessible in the published literature have investigated the nature of social interactions among humans and dogs and assessments of whether owners and their dogs resemble each other. Notwithstanding surveying dog owners’ perceptions of the physical environment, there are few objective assessments and descriptions of the environment in which they walk. A recent exception is the work by Coleman et al. who found that owners who walked their dogs were more likely to live in high walkable neighborhoods than owners who did not walk their dogs. In their comprehensive review of the current literature, Cutt et al suggest that future research should consider the importance of the physical environment or ‘place’ on dog walking including assessment of the unique features of destinations such as parks, streets, and beaches that enable or discourage dog walking. The limited evidence available recommends parks to be of a linear design, with defined boundaries, and with on- and off-leash rules. As well, it is critical to “measure whether people walk with their dog as opposed to walk their dog. In the latter case, owners may chat, sit on a bench or throw a ball while their dog exercises alone, or with other dogs.”

Subsequently, in developing their dogs and physical activity tool, Cutt et al found distinct subscales relating to the physical features of parks conducive to dog walking which include quality of the open space (eg, paths, attractive landscaping), dog management infrastructure (eg, signage for on and off leash rules, bins), safety, and open space with seating (eg, benches, lighting). In addition to assessing the physical environment, observational methods can also be used to estimate physical activity levels and provide overall utilization rates of a geographical area, to address the limitations inherent in data gathered through self-report surveys.

**Physical Activity and Weather**

Weather conditions have been understudied as a determinant of physical activity behavior, including outdoor walking patterns: “Given the obesity has reached epidemic proportions worldwide, it seems imperative to acknowledge the effect of season and weather on physical activity.” In their international review of season
and weather effects on physical activity in 8 countries, Tucker and Gilliland\textsuperscript{48} found activity levels to vary with seasonality and subsequent effects of poor weather acted as a deterrent to outdoor active living. In North America, seasonality, climatic, and weather conditions have also been found to influence physical activity and energy expenditure levels in Canada and the U.S., with statistically significantly higher activity reported during summer than winter months.\textsuperscript{49–51} The decline has been attributed to shorter days and more extreme weather conditions typical of winter months, notably continued precipitation, colder temperatures and wind that can hinder outdoor activity for an extended period of time.

**Purpose of the Study**

In this study, we were interested in exploring if the self-reported walking practices of dog owners could be confirmed through observational data. In particular, we wanted to document (a) the use of public parks by dog owners and nondog owners, (b) the types of physical activity engaged in by park users, and (c) the weather effects (precipitation, wind, temperature) on park use and types of physical activity between dog walkers and nondog walkers. We hypothesized that park use would be greater among visitors without dogs than those accompanied by dogs; walking would predominate as the most common type of physical activity; and dog owners would use public parks more in poor weather than nondog owners for the purposes of walking and exercising their dogs.

**Method**

**Design and Sample**

In this observational design, the authors visited 6 public parks spanning a 12-week period in the Victoria, British Columbia electoral area (within the municipalities of Saanich, Oak Bay, and Victoria on South Vancouver Island). Parks were purposely selected to represent the 3 major types (multisport, neighborhood, and walk-through), sizes (ranging from .55 to 13.5 ha), and locations within the Greater Victoria area, and all with clearly marked on and off leash rules. Visits occurred over 2 observational time periods: (1) 6 weeks in May, June, and September 2007 (avoiding summer holidays), and (2) 6 weeks in January through April 2008. Approval for observing park users was secured through our institutional human research ethics board.

Observations of the types of physical activity engaged in by park users\textsuperscript{1} for 1 hour in the morning (7–8 AM), evening (5–6 PM), and for 1 hour on a weekend midday in each park were documented. No a priori days of the week/weekend were selected to conduct the observations; rather weather dictated the park visits (during sunny and fair conditions in season 1, and rainy and windy conditions in season 2). To minimize the bias toward coding for walking and/or sitting/standing in parks with multiple entrances, observers were positioned such that their view was panoramic and not adjacent to entrances (which would maximize observations of walking) nor centrally placed (which would maximize observations of sitting and standing). In the larger walk through parks, observers were stationed at 2 distinct points to account for different access points and sizes.

Each park was audited in both time periods and all of the parks were observed in the same weather conditions. Average temperature, precipitation, and wind speed for these 2 seasons ranged from 14.6°C, 28.46 mm, and 8 km/h winds, to 5.97°C, 85.2 mm, and 9.625 km/h winds (with maximum wind speeds recorded at 100 km/h) respectively.\textsuperscript{52} In these 3 municipalities, the 203,420 residents are considered both physically active and dog friendly: 67% of adults (that is, 136,291) are active on a regular basis (15% higher than the national average),\textsuperscript{53} cite walking as their preferred type of activity,\textsuperscript{7} and under half of the total population (41.25% or 83,910) live with dogs.\textsuperscript{54}

**Measures**

The Physical Activity Resource Assessment (PARA)\textsuperscript{55} was conducted by 1 author (JWH) to categorize each park in terms of its features, amenities, and incivilities present. Features represent opportunities for different types of physical activity, such as baseball, tennis, soccer etc. Amenities refer to the presence of benches, landscaping, drinking fountains, etc., that may make it more or less pleasurable or convenient or safe to be active. Incivilities reflect attributes of the environment that may reduce pleasure associated with using the park or represent social ills, such as litter or vandalism. Parks were rated on the first 2 dimensions by scoring them with the range from 0 (not present; eg, no benches), to 1 (poor; benches broken and unusable), to 2 (mediocre; eg, benches missing some paint or boards, but otherwise usable), or 3 (good; benches in good condition, but could have minor aesthetic flaws).

Incivilities were scored using the same numerical range, but the continuum of attribute descriptors went from minimal (score of 1, a rating of low incivilities) to many (score of 3, a rating of high incivilities). Three observers (two of the authors and 1 graduate student) were trained in the use of a modified version of SOPARC,\textsuperscript{56} which we called the Standardized Observation of Physical Activity With Dogs (SOPAWD), to include coding for dog details recommended in the literature.\textsuperscript{49} SOPARC is a direct observation instrument designed to record information about physical activity of park users as well as characteristics of the users (ie, gender, age group, ethnicity, and number of companions). With SOPARC, as with other studies of assessing physical activity in open spaces,\textsuperscript{14} the rubric of physical activity within a park is categorized as 1 of 3 different types which serve as a prototype for levels of physical activity: Sedentary (ie, lying down, sitting or standing), Walking, or Vigorous (eg, jogging, playing tag). By applying systematic periodic scans using momentary time sampling, “snap shots” of activity in the park were acquired.
Each observer was assigned 2 parks and collected data in those parks in time observation periods 1 and 2. Park sites were visually scanned from left to right to avoid recording the same individual (or groups of individuals) twice as they walked (or jogged) back and forth, and data were recorded during 6 sweeps of 10 minutes on separate sheets for park users with and without dogs. Weather conditions were coded on site; temperature was confirmed by Environment Canada’s website. Hand coded observations were entered into SPSS 16.0, and the dataset was examined and corrected for missing observations.

Statistical Analysis

Descriptive statistics were determined for all variables measured, including frequencies, mean, standard deviation, and range. Pearson chi square coefficients were calculated to compare observations between dog walkers and nondog walkers’ use of public parks and physical activity levels over the 2 seasons.

Results

Table 1 presents the findings of PARA that describes park type. Parks 1 and 2 (multiuse) in Saanich and Oak Bay respectively, provided the most variety of physical activity opportunities (features) for park users, primarily for baseball, soccer, and tennis, while 1 neighborhood (park 5 in Victoria) and 1 walk-through (park 6 in Saanich) provided the least. According to PARA’s rating scheme, parks in these municipalities are well maintained and safe places to visit. The quality of features (overall mean = 2.90) and amenities (overall mean = 2.47) were rated very high, while the presence of incivilities were low (overall mean = 1.08). The physical features of parks conducive to dog walking noted by Cutt and colleagues were present at all of the 6 parks.

The total count of visitors we observed, documented and were able to fully code numbered 2844 in all 6 parks over both time periods. Not surprisingly, the numbers of park visitors were significantly higher in the first observational period with better weather (2119) than in the second (725) ($\chi^2 = 67.55, P < .000$). As expected, significantly more people without dogs (73%) used all types of parks than those with dogs (27%) ($\chi^2 = 27.08, P < .000$). Table 2 presents park type usage by dog status. Because of the greater amount of physical activity features present in multiuse parks, nondog walkers visited multiuse parks (1 and 2) in significantly greater numbers than dog-walkers, to participate in a variety of activities, including walking on its paths, or as spectators of the multiple sports activities available (eg, tennis, soccer). There were no significant differences in visits between these 2 groups at the neighborhood parks.

In terms of physical activity level, most people used parks for walking (69%) in each of the 3 park designs over both observation periods (Table 3). There were no observations of vigorous activity in neighborhood parks in either periods, which were much smaller, nestled in between housing, schools, and major roadways, and featured children’s playground equipment but no fitness equipment or designated jogging/cycling paths. All 3 types of activity levels were noted during the summer months in multiuse and walk through parks. Slightly more vigorous activity (eg, jogging) in winter was observed in the walk-through than in the multiuse parks.

In the summer, visitors to multiuse parks engaged in significantly more walking and sitting than vigorous activity, outnumbering those who engaged in team sports. In walk-through parks, significantly more walking by visitors was observed than either sitting or vigorous activity. No significant differences were found for physical activity level in neighborhood parks. In winter, walking was the preferred activity among park visitors over sitting/standing and vigorous activity across all 3 park types.

Weather effects (precipitation, temperature, wind) on park use and physical activity level were found between dog walkers and nondog walkers (Figures 1 and 2). In the first time period during the summer months with favorable weather, 49% of people without dogs were observed walking, and 9% were engaged in more vigorous activities. During the months of poor weather in time period 2, nondog walking and vigorous activity levels fell significantly by 35% ($\chi^2 = 69.44$) and 5% ($\chi^2 = 10.08$, respectively ($P < .01$). There were no significant differences among dog walkers’ visits over the 2 time periods, indeed frequency of visits for walking during the months of winter weather in the second time period rose by almost 6%.

<table>
<thead>
<tr>
<th>Park type/location</th>
<th>Features</th>
<th>Quality of features</th>
<th>Amenities</th>
<th>Quality of amenities</th>
<th>Incivilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Mean</td>
<td>Count</td>
<td>Mean</td>
<td>Count</td>
</tr>
<tr>
<td>1. Multiuse/Saanich</td>
<td>10</td>
<td>2.4</td>
<td>6</td>
<td>2.6</td>
<td>3</td>
</tr>
<tr>
<td>2. Multiuse/Oak Bay</td>
<td>8</td>
<td>3.0</td>
<td>9</td>
<td>3.0</td>
<td>0</td>
</tr>
<tr>
<td>3. Neighborhood/Saanich</td>
<td>4</td>
<td>3.0</td>
<td>9</td>
<td>2.1</td>
<td>2</td>
</tr>
<tr>
<td>4. Walk-through/Victoria</td>
<td>3</td>
<td>3.0</td>
<td>10</td>
<td>2.9</td>
<td>3</td>
</tr>
<tr>
<td>5. Neighborhood/Oak Bay</td>
<td>2</td>
<td>3.0</td>
<td>8</td>
<td>2.0</td>
<td>3</td>
</tr>
<tr>
<td>6. Walk-through/Saanich</td>
<td>2</td>
<td>3.0</td>
<td>6</td>
<td>2.2</td>
<td>2</td>
</tr>
</tbody>
</table>
Table 2  Park Type Usage by Dog Status (N = 2844)

<table>
<thead>
<tr>
<th>Park type</th>
<th>Dog status</th>
<th>Number</th>
<th>%</th>
<th>$\chi^2$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiuse</td>
<td>No dog</td>
<td>842</td>
<td>86.6</td>
<td>92.302</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>With dog</td>
<td>130</td>
<td>13.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walk through</td>
<td>No dog</td>
<td>1148</td>
<td>66.9</td>
<td>35.013</td>
<td>&lt; .000</td>
</tr>
<tr>
<td></td>
<td>With dog</td>
<td>566</td>
<td>33.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neighborhood</td>
<td>No dog</td>
<td>85</td>
<td>53.6</td>
<td>.143</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>With dog</td>
<td>73</td>
<td>46.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3  Observational Time Period, Park Type, and Physical Activity Type (N = 2844)

<table>
<thead>
<tr>
<th>Observational time period</th>
<th>Park type</th>
<th>Sitting/standing</th>
<th>Walking</th>
<th>Vigorous</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (summer)</td>
<td>Multiuse</td>
<td>414 (42.8)</td>
<td>420 (43.5)</td>
<td>120 (13.7)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Walk-through</td>
<td>78 (7.3)</td>
<td>882 (82.6)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>108 (10.1)</td>
</tr>
<tr>
<td></td>
<td>Neighborhood</td>
<td>42 (36.8)</td>
<td>72 (63.2)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>2 (winter)</td>
<td>Multiuse</td>
<td>6 (10.0)</td>
<td>48 (80.0)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>6 (10.0)</td>
</tr>
<tr>
<td></td>
<td>Walk-through</td>
<td>18 (2.8)</td>
<td>540 (84.9)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>78 (12.3)</td>
</tr>
<tr>
<td></td>
<td>Neighborhood</td>
<td>0 (0.0)</td>
<td>12 (100.0)</td>
<td>0 (0.0)</td>
</tr>
</tbody>
</table>

<sup>a</sup> Significant difference from walking and sitting/standing at $P < .000$.

<sup>b</sup> Significant difference from sitting/standing and vigorous activity at $P < .000$.

Figure 1 — Physical activity types of park visitors without dogs across 2 observational time periods.
Discussion

As in other urban areas, the findings from this study suggest that public parks provide an important resource for residents to be active through walking, with or without a 4-legged companion, primarily during favorable weather in the summer months (observational time period 1). Importantly, unlike previous research, our findings are not based on self-reports from dog owners, rather standardized observations of park visitors, their types of activity and companions in differing weather conditions. As shown in Figure 1, when inclement weather arrived, nondog walkers’ visits plummeted while dog walkers’ use of parks remained constant (Figure 2), supporting earlier research. We can only speculate as to the reason dog walkers’ braved wet and windy weather to visit parks, but it may be related to the sense of obligation for their pet’s wellbeing. In addition, this finding lends support for dog walkers’ self-reported higher frequency and duration of walking than either those who live with dogs, but walk without them, or who live without dogs. The preference for walking over sitting and standing among dog owners in Victoria parks suggests that indeed “people walk with their dog as opposed to walk their dog.” In fact, we documented very few instances of dog owners solely standing and throwing the ball without engaging in some walking of their own, a finding which counters observations of lower levels of activity in dog play and open space areas. In these 3 municipalities, parks may serve less as a gathering and resting place for dog owners than non-dog owners, the latter of whom use parks for more purposes than walking (eg, spectator sports, playing with children). As expected, inclement weather affected nondog walkers’ use of public parks. Nondog walkers may have relied on indoor facilities to sustain their exercise routines, an option not available to those whose activity practices include dogs.

Our study found that the park type that best supports walking, for dog owners and nondog owners alike, are those with a linear-based design, such as walk-through, which provide sites for leisure-time walking, and neighborhood parks which are situated close to homes and offer safe short-cuts for active commuting to destinations. If indeed the quality (well maintained, safe) and structure (amenities) of such ‘formal’ green spaces with their network of paths is important to peoples’ decisions to be active, as some have suggested, then residents are well served by parks in Greater Victoria and the municipal policies that provide for dog management infrastructure, physical activity resources, landscaping, and regulations for litter and vandalism. Our experience lends support to the case for enhanced collaboration among urban transportation planning and park design, and urban containment policies to encourage active commuting and active leisure. Because of the decline in park visits during poor weather, particularly for nondog owners, increased attention to park management and upkeep of amenities may be important strategies to encourage year-round activity.

Study Limitations

This observational study used momentary time sampling and did not track the total time visitors spent in parks, gather self-reported activity levels of park visitors, nor use more objective means, such as accelerometers, and thus we are unable to report visitors’ precise totals for energy expenditure, frequency or duration of physical activity. Observations only represented weekday mornings, evenings, and weekend midday patterns of park use.
during 2 extreme weather conditions, thus our comparisons may be overstating the average situation. As well, these observation periods biased the results to employed adults, and possibly under reported the walking practices of retired or nonemployed adults who may have accessed the parks at other times of the day.

Neither did we document the time park visitors spent engaging with others, nor the nature of their interactions, so we are unable to comment on the potential for dogs to serve as conduits of social capital as others have suggested.64 This is a promising line for future research to further understand both the physical and social salutary benefits of dog walking in the public realm. Another limitation is that we assumed that those individuals who we observed walking dogs actually owned them, and were not hired help. For example, in Australia, 23% of dog owners admit to not walking with their dog.65 These issues are important to consider in future research to fully understand the role that public parks and dog walking play in peoples’ decisions to be active. As well, because the climate of Victoria is considered moderate relative to other cities in North America, more varied and/or severe weather patterns should be included in observational studies, as well as seasonal influences.

Conclusion

As dog owners, we reflected that our canine companions prompt us to go for walks at least twice a day, despite our human preference and instinct to remain indoors when the winds howl and the rains fall. Our personal experiences stimulated this investigation to determine if our practices were borne out by other dog owners, and to confirm the growing, largely self-reported evidence, that dogs can serve as a motivational support for physical activity behavior. The idea that people walk their dogs out of a sense of responsible pet ownership is reinforced through our observational snapshot of park use: dog owners maintained their walking practices through fair and foul weather. Over 7 years ago, Baumann and colleagues34 estimated annual healthcare savings of $175 million should Australian dog owners walk their dogs on a regular basis. If indeed the promise of walking in public park and green spaces is to be realized as a population health intervention,50 our study adds to the compelling evidence that dog walking offers “…an untapped health promotion resource waiting to be let off the leash.”65

Acknowledgments

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References


