Landscape and Urban Planning 153 (2016) 40–50

Contents lists available at ScienceDirect

Landscape and Urban Planning

journal homepage: www.elsevier.com/locate/landurbplan

Research paper

Dog-walking, dog-fouling and leashing policies in urban parks: Insights from a natural experiment designed as a longitudinal multiple-case study

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HIGHLIGHTS

- Dog-walking to, from and within urban parks may promote health.
- Creating off-leash park areas did not consistently increase dog-walking.
- Leaving behind dog-feces (i.e., dog-fouling) in parks may detract from health.
- Creating off-leash park areas did not consistently increase dog-fouling.
- Physical and social environments may influence dog-walking and dog-fouling.

ARTICLE INFO

Article history:
Received 18 September 2015
Received in revised form 13 April 2016
Accepted 28 April 2016

Keywords:
Physical activity
Dogs
Parks
Policy studies
Case studies
Natural experiments

ABSTRACT

In this natural experiment, we investigated on-leash and off-leash policies as plausible influences on the behavior of dog-walkers in the City of Calgary, Alberta, Canada. Following policy-mandated public consultations, two of the four parks initially proposed by the City as sites for new off-leash areas retained on-leash designations. Within a year of creating off-leash areas in two parks, we observed more dog-walkers and improved compliance with dog-fouling in one case, but not in the other. Compared to the previous year, we also observed more stationary dog-walkers in both of these parks. Paradoxically, activity levels amongst dog-walkers – including while dogs were off-leash – remained highest for a park that retained an on-leash designation. Off-leash policies in urban parks could have positive as well as negative implications for public health. In addition to off-leash policies, factors that merit consideration regarding dog-walking and dog-fouling include implementation strategies, physical features, socio-demographic characteristics and modifications to park environments.

1. Introduction

In urban populations, parks are key settings for physical activity, emotional restoration, and social interactions (Bernard et al., 2007; Gatrell, 2013; Koohsari et al., 2015). Thus park-related policies are prime examples of how local governments could promote health (WHO, 2008). Similar to other interventions that reach large numbers of people, park-related policies typically facilitate only small changes for individuals. Nonetheless, the cumulative impacts of policy interventions can be far-reaching and more cost-effective than targeting the lifestyles of higher-risk groups (Rose, 1992).

Yet, the impact of park-related policies on visitation and activity patterns remains unclear. This lack of clarity is partly due to an evidence base that has relied mainly on cross-sectional study designs (Koohsari et al., 2015; McCormack, Rock, Toohey, & Hignell, 2010; McCormack & Shiell, 2011). To address this concern, Koohsari et al. (2015, p. 76) called for "experimental studies that measure behaviours before and after the introduction of new public open space or renovation of existing public open space." By way of example, Koohsari et al. (2015, p. 76) cite a research protocol for a natural experiment (Veitch et al., 2014). That protocol outlined before-and-after comparisons within a park that was slated for renovation in a lower-income neighborhood, and in comparison

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http://dx.doi.org/10.1016/j.landurbplan.2016.04.018
0169-2046/

with usage patterns in a park with similar physical features but that was located in a higher-income neighborhood (Veitch et al., 2014). Overall, Koohsari et al. (2015, p. 80–81) advise researchers to compare activity patterns in multiple settings and across social groups, while attending to the characteristics of both parks and surrounding environments.

At its broadest, a "natural experiment" refers to detailed comparisons of events and contexts over time, whether or not the researchers study control groups or cases for the purposes of comparison and to assist with drawing inferences about causality (Gerring, 2004). In public health, the term "natural experiment" usually refers to methodological approaches that researchers employ to capitalize on unplanned or uncontrolled events, so as to document variation and to draw inferences, to the extent possible, about the causes of disease and injury (Craig et al., 2012). In policy studies, meanwhile, natural experiments tend to be designed as case-studies (Gerring & McDermott, 2007; Robinson, McNulty, & Krasno, 2009). Case-study designs are "preferred when examining contemporary events, but when the relevant behaviours cannot be manipulated" (Yin, 2013, p. 12).

To our knowledge, only one natural experiment has examined the health impacts of an off-leash policy (Veitch, Ball, Crawford, Abbott, & Salmon, 2012). An enclosed off-leash area was constructed as part of a series of improvements to a single park. That park was located within a lower-income neighborhood in Melbourne, Australia. Physical activity increased overall within this park, and also relative to a nearby park that did not undergo any changes to the physical or policy environment (Veitch et al., 2012). Nevertheless, the researchers did not report specifically on dog-walking.

For this natural experiment, we aimed to understand the impacts, if any, of a policy change on public health. To do so, we designed a mixed-method longitudinal multiple-case study (Gerring, 2004; Yin, 2013). Using a socio-ecological approach, we studied four parks where policy-directed plans were in place to include officially designated off-leash areas. We sought to ascertain whether creating off-leash areas resulted in any changes to park visits and activity levels amongst dog-walkers. We also wanted to investigate whether creating off-leash areas led to any changes in dog-fouling (i.e, leaving behind dog-feces, whether intentionally or inadvertently). For our purposes, "socio-ecological" refers to "people's transactions with their physical and sociocultural environments" (Sallis, Bauman, & Pratt, 1998, p. 379), whereas "policy" refers to legislation, regulations, officially-endorsed statements or formal rules that have the potential to influence human activity (Sallis et al., 1998, p. 379). Policies envelop physical and social environments in socio-ecological theory as applied to urban parks (Bedimo-Rung, Mowen, & Cohen, 2005).

2. Background

Dog-ownership is relevant to urban planners because dogs reside in about one-fifth to one-half of urban households across Australia, Canada, Europe, China, Japan, the United Kingdom and the United States (Bauman et al., 2011; Hansen, 2013; Headey, Na, & Zheng, 2007; Perrin, 2009). Local councils increasingly require close supervision of dogs in urban areas so that people's pets do not become a public threat or nuisance (Rock, Adams, Degeling, Massolo, & McCormack, 2014). As a matter of urban policy, dog-owners are no longer allowed to turn their pets out to roam (Grier, 2006; Pemberton & Worboys, 2013). Rather, local councils often require dogs to be leashed in public (Howell, 2012), with the exception of designated off-leash areas or dog parks. Indeed, on-leash defaults have become the policy norm in cities and towns throughout the United States (Matisoff & Noonan, 2012) and Canada (e.g., McCormack, Rock, Sandalack, & Uribe, 2011; Temple, Rhodes, & Wharf Higgins, 2011), to the chagrin of many dog-owners (Degeling & Rock, 2013; Holmberg, 2013; Tissot, 2011; Urbanik & Morgan, 2013; Walsh, 2011). Additionally, local councils often stipulate that dog-owners are personally responsible for promptly removing dog-waste from public space (Brandow, 2008; Instone & Sweeney, 2014).

2.1. A socio-ecological perspective on dog-walking and urban policies

Over the past ten years, interest has grown in dog-walking as a means of promoting physical activity. An influential review inferred that policies to allow dog-walking (i.e., any human activity while accompanied by dogs in public) could support physical activity in populations with high levels of dog-ownership (Cutt, Giles-Corti, Knuiman, & Burke, 2007). Subsequently, a systematic review and meta-analysis found that dog-owners were more likely than non-dog-owners to meet recommendations for physical activity, with 60% of dog-owners engaging in some dog-walking, for an average of 160 min in 4 outings per week (Christian et al., 2013). Following on from these findings, socio-ecological theory was adapted to distill correlates of dog-walking (Westgarth, Christley, & Christian, 2014).

Like many other applications of the socio-ecological model in health promotion (Richard, Gauvin, & Raine, 2011), Westgarth et al. (2014) offer a "visual metaphor" consisting of a "series of concentric or nested circles which represent a level of influence on behavior" (McLaren & Hawe, 2005, p. 9). They conceptualize the "social environment" in terms of homes, families, friends, community and neighborhoods. The "physical environment", meanwhile, envelops the "social environment" and the "policy environment" surrounds all of these in their socio-ecological model. (See: http://www.ijbnpa.org/content/11/1/83/figure/F1.) Unlike most socio-ecological models, however, their rendition acknowledges the presence of dogs in people's daily lives and as influences on social networks and experiences in public space. They surmise that the extent, cadence and frequency of dog-walking results from interactions across these levels of influence (Westgarth et al., 2014).

Consistent with a socio-ecological approach to managing urban parks as public resources for physical activity (Bedimo-Rung et al., 2005), Westgarth et al. (2014, p. 8) cite research that found park proximity as important for dog-walking, based on evidence of positive associations in 7 studies. This finding is consistent with a socio-ecological approach to managing urban parks as public resources for physical activity more generally (Bedimo-Rung et al., 2005). And with reference to 4 studies (Bekoff & Meaney, 1996; Cutt, Giles-Corti, Wood, Knuiman, & Burke, 2008; Underhill-Day & Liley, 2007; Williams, Weston, Henry, & Maguire, 2009), they observe "that being able to walk their dog off-leash is important for many dog-walkers" (Westgarth et al., 2014, p. 8). In addition, they identified dog-supportive infrastructure is a plausible correlate of dog-walking (Westgarth et al., 2014, p. 8). Focus groups conducted with dog-owners in Australia (Cutt, Giles-Corti, Wood et al., 2008, together with intercept-surveys undertaken with park visitors in the United States (Lee, Shepley, & Huang, 2009) and in Romania (Iojă, Rozylowicz, Pătroescu, Niţă, & Vânau, 2011), suggest that dog-supportive infrastructure could include "clear signage, dog litter bags and bins, accessible water sources, fencing around designated off-leash areas, separation from children's play areas, dog agility equipment, parks not being located near busy roads and being well-fenced" (Westgarth et al., 2014, p. 8). All of the physical features of park environments highlighted in the socio-ecological review undertaken by Westgarth et al. (2014, p. 8) reflect policy decisions.

Based on the available evidence, Westgarth et al. (2014) state that the most consistent correlate of dog-walking comprise dog-owner relationships (i.e., "the social environment"). Factors that