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Use and activity levels on newly built bicycle playgrounds

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ABSTRACT

Increasing the use of urban green space (UGS) as well as increasing cycling could potentially help address the growing inactivity problem. Three bicycle playgrounds were designed based on a participatory process and afterwards constructed in the UGS along a cycle-route on the historic outer defence circle around the City of Copenhagen, the Copenhagen Fortifications. The concept of a bicycle playground is new, and to examine how the three areas were used, and explore how users experience the areas, this study was designed as a combination of systematic observations, using the System for Observing Play and Recreation in Communities (SOPARC), and short on-site interviews with 'typical users'. Based on the structural observations and 12 short interviews it became clear that 63% of the users were active during their use. The bicycle playgrounds main users were teenagers and children, especially boys. The interviewed users were, in general, very positive about the sites; they liked the concept and thought that it offered a new type of activity possibility. Many of the interviewed users said they lived 10–20 min away (by bicycle), but there were also a number of interviewees that lived very close to one of the sites. A future study involving objective before and after measures when a new bicycle playground is build will be needed to reveal if bicycle playgrounds can provide additional activity to its users, or 'just' a different type of activity, in a different location.

Introduction

Regular physical activity (PA) reduces the risk of non-communicable diseases such as type 2 diabetes, coronary heart disease, hypertension, depression, and breast and colon cancers, and increases life expectancy (Lee et al., 2012). Furthermore, PA is a crucial part of energy expenditure, and a key to weight management and prevention of obesity (Donnelly et al., 2009). Worldwide 31.3% of adults (aged 15 years and over) are physically inactive (Hallal et al., 2012). For Denmark, 35.1% of adults can be classified as inactive (Hallal et al., 2012), and 9.4% of all premature deaths can be related to physical inactivity (Lee et al., 2012). On average worldwide, the proportion of 13- to 15-year-olds adhering to the recommended 60 min of moderate to vigorous intensity PA per day is only 19.7% (Hallal et al., 2012).

The level of PA, both overall and within various activity domains (e.g., leisure and transport), is influenced by many different factors and socio-ecological models (Sallis et al., 2006) are frequently used to help structure them. Bauman et al. (2012) conducted a large review of reviews of potential correlates of PA, using a socio-ecological model as framework, and concluded that the individual level factors age, sex, health status, self-efficacy, and motivation were associated with PA. They furthermore concluded that few consistent environmental correlates had been identified for different domains of PA, but that recreational facilities and locations (e.g., urban green space), and transport facilities were among the more robust correlates, both for leisure time PA, transport-related PA, as well as overall PA (Bauman et al., 2012).

In other words, it seems that promoting the use of urban green space (UGS) as well as increasing active transport could potentially help address the growing inactivity problem. In terms of active transport, in particular cycling is referred to by some as the panacea for physical inactivity being cheap, easily accessible and with a potentially high population reach (Bauman et al., 2011). Several factors have been reported to affect cycling for transport including distance, weather, environment, safety and hilliness, along with socio-economic and individual psychological factors (Fraser and Lock, 2011; Heinen et al., 2009).

Factors affecting the use of UGS have been reported to be: neighborhood characteristics (Van Dyck et al., 2013), distance to nearest UGS (Cohen et al., 2007; Kaczynski et al., 2008; Schipperijn et al., 2010b, 2013), size of the UGS (Kaczynski et al., 2008; Schipperijn et al., 2010a) and the number of UGS close to home (Kaczynski et al., 2009). In their conceptual model Bedimo-Rung and colleagues

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(2005) suggested that the conditions and design of elements influence green space users, which was later supported by other studies (Bedimo-Rung et al., 2005; Cohen et al., 2006; Kaczynski et al., 2008; Schipperijn et al., 2013).

A partnership consisting of The Danish Nature Agency, The Danish Agency for Culture, and Realdania (a large philanthropic organization in Denmark) saw an opportunity to try and increase cycling in UGS and at the same time disseminate the history of the Copenhagen Fortifications, the outer defence circle around the City of Copenhagen. The history of the Copenhagen Fortifications is closely linked with the introduction of bicycles as means of transport in the Danish army in the late 1800s when the Fortifications were built. The Partnership appointed the Danish Cancer Society as project manager, who, in conjunction with GHB Landscape Architects, created a series of bicycle playgrounds along the cycle-route on the Copenhagen Fortifications.

The aim of the bicycle playgrounds is increasing physical activity among its users by providing a new type of activity environment. After involving a series of potential users the Danish Cancer Society together with the designers came up with a common concept used as basis for the bicycle playgrounds. The concept builds on providing a combination of four elements in a limited space (roughly 50 by 100 m), with a budget of 50,000–70,000 Euros. The four elements are: table tops, raised platforms with an up ramp and down-ramp, can either be rolled over or jumped; pump tracks, closed circuits with 'bumps' in between and banked corners at each end, they are designed to be ridden without pedaling; skinnies, narrow beams on which the rider needs to balance; and finally see-saws where the rider needs to balance before tipping down. Each bicycle playground should be suitable for kids and teens living nearby, as well as cyclists of all ages passing on the 14 km long bicycle route along the Fortifications. The bicycle playgrounds should be useable without specific training, and not require a specific type of bicycle, but at the same time they should have more challenging elements for more skilled riders. Because of the location of the bicycle playgrounds along the Copenhagen Fortifications, and inline with other aims of the Partnership, disseminating the history of the Fortifications became a secondary aim for bicycle playgrounds.

The concept of a bicycle playground is new, and for that reason we do not have knowledge on how many and which type of users will actually visit the areas, nor do we know if the bicycle playgrounds will be used for physical activity. The purpose of the present study is to record the use of the three new bicycle playgrounds, assess the activity level of the observed users and describe how the areas are experienced by users, in order to be able to evaluate the success of the concept of bicycle playgrounds.

Method

Study area

The data in this study was collected on three new bicycle playgrounds located along the Copenhagen Fortifications in the Greater Copenhagen area. The three areas are known as 'Batteriet', 'Lejren' and 'Sporet'. All three areas are located directly adjacent to the cycle route that runs along the entire fortification ring (see Fig. 1). As described above, the design of the three sites builds on combinations of four main elements, table tops, pump tracks, skinnies, and see-saws. Fig. 2 provides an impression of how the areas look. Information about how to use the bicycle playgrounds safely is provided on signs at the entrance of each site. Users are recommended to wear a helmet and parents are advised not to let younger children use the bicycle playgrounds unsupervised. Use of the bicycle playgrounds is at own risk and the areas are officially categorized as outdoor sports-facilities, not playgrounds, which, under Danish law, greatly reduces the number of safety regulations that apply.

The neighborhoods around the three areas are characterized by many high-rise apartment buildings and a population with a relatively high unemployment, a relatively low average educational status and a relatively high percentage of inhabitants with a non-western background.

Batteriet is located on the edge of lawn area and primarily consists of table tops and pump tracks. Batteriet is located close to a pre-school and day-care center. Lejren also consists of table tops and pump tracks, but is located in a woodland clearing. Sporet primarily consists of pump tracks, including one particular challenging steep hill and is located on a woodland edge, close to a large housing area. The construction cost for Lejren were 49,700 Euro, Sporet 67,100 Euro and for Batteriet 71,900 Euro.

Study design and sampling

To examine how the three areas were used, and explore how users experience the areas, this study was designed as a combination of systematic observations and short on-site interviews with 'typical users'.

All users were observed during the systematic observations, and based on this the 'typical user groups' were identified for each site. After the last few observation sessions, users that matched the characteristics of a 'typical user' were approached for an on-site interview. On each site the first four users that agreed to participate were interviewed, accounting for the need to interview persons from different 'typical user' groups.

Data collection

Systematic observations

The System for Observing Play and Recreation in Communities (SOPARC) is an objective observation tool to collect information about park users and their characteristics. It provides data in terms of the number of users, gender, age, type of activity and PA level. The instrument is a reliable method for assessing PA levels and characteristics of park users (McKenzie et al., 2006). The SOPARC protocol describes 28 separate observations per location, on four 1-h time periods per day starting at 7:30AM, 12:30PM, 3:30PM and 6:30PM, for all days of the week. During the 1-h observation period two scans (one every 30 min) were made during which gender, age group (children, teenagers, adults, seniors), and PA level; sedentary (e.g., lying down, sitting, or standing), walking, or vigorously active (activity more vigorous than an ordinary walk), were recorded for all users. Each scan should be considered a static record of what was happing at the specific time of the scan, and any change in users or activity level between scans is not recorded. For each observation period the total of two scans was calculated. We also recorded the weather conditions (clear, cloudy, rainy) and whether the activity was organized (e.g., sports or games). Recordings were made on paper, using a translated version of the SOPARC scoring form developed by McKenzie et al. (2006). Data were collected in the three areas simultaneously during May–July 2013, and for each area the observation periods were distributed more or less evenly over these three months.

Interviews

In July 2013, short semi-structured interviews with four 'typical users' at each site were conducted.

Based on a short interview guide respondents were asked: how far they had traveled to get here, how often they visited, how long a typical visit lasted, if they usually came alone or with other, if they were meeting others, how they experienced the site and if they liked it, what they liked or not liked, how they used the site, which