



The effects of naturalness, gender, and age on how urban green space is perceived and used



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ARTICLE INFO

Article history:

Received 16 October 2015

Received in revised form 10 June 2016

Accepted 13 June 2016

Available online 16 June 2016

Keywords:

Cultural ecosystem services

Green infrastructure

Landscape planning

Well-being

ABSTRACT

Neighbourhood green space serves an important function for the urban population, and provides valuable ecosystem services for human well-being. In this article, we investigate the effects of naturalness, gender, and age on the activities, aesthetics, and self-reported well-being associated with urban green space. Our findings are based on a postal survey of residents living in close proximity to six different green spaces in the city of Gothenburg, Sweden. It is shown that higher perceived naturalness generated more activities and higher aesthetic values and self-reported well-being for residents living close to urban green spaces. The results also indicated that, regardless of the type of naturalness, women were more active in urban green spaces than were men. Women also saw greater aesthetic value in green spaces than men did, and had higher self-reported well-being associated with the urban green spaces. Finally, older residents were shown to participate in a greater number of nature-related activities than younger residents. Older residents also saw greater aesthetic values and had higher self-reported well-being associated with urban green spaces than younger people did. Seemingly, this poses a considerable planning challenge if areas of perceived naturalness are to be retained in cities, since the present trend is for reduced green spaces in cities and a 'parkification' of surviving natural areas. Further, because of the importance of perceived natural areas to the elderly, and in particularly women, distances to urban green areas should not be too great.

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1. Introduction

The process of urbanisation is increasing across the globe, with an expected increase from half of the world population in 2010 to two-thirds by 2045 (UN, 2014). This process will, in many cases, lead to a densification of cities, with development bringing increasing pressure on existing green spaces in both urban and peri-urban areas (James et al., 2009). Urban green space plays a crucial role as many functions important to sustainable development are restricted to its limited space (Pauleit 2003; Konijnendijk et al., 2013). In the face of the current demand for densification and development, it is imperative to investigate the importance of urban green space for people's well-being.

In terms of urban ecosystem services, the importance of urban green spaces for human well-being is already recognised (for example, Haase et al., 2014; Van den Berg et al., 2014; Lachowycz and Jones, 2013). However, cultural ecosystem service and its relation to human well-being have as yet not been fully addressed. Indeed, more research is needed on cultural ecosystem services per se (Chan et al., 2012; Hernández-Morcillo et al., 2013), and especially the links between biological ecosystem outcomes, health, and well-being (Sandifer et al., 2015)—a concern that is raised in the European Landscape Convention (Council of Europe, 2000), for example.

In several studies, natural settings have been shown to be more effective for stress recovery than non-natural settings (for example, Van den Berg et al., 2014; Hartig et al., 1991; Purcell et al., 2001; Staats et al., 2003; Tyrväinen et al., 2014). The concept of naturalness (often defined as the perceived nearness to a natural stage of vegetation, see Ode et al., 2008) has been shown to have a strong relationship with landscape preference (for

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example, Junge et al., 2015; Ode et al., 2009; Van der Jagt et al., 2014). There have been several attempts to gauge the relative importance of the degree of naturalness or content of a natural setting and its beneficial effect on health (surveyed in Velarde et al., 2007). For example, Nordh et al. (2009, 2011) singled out the importance of structural elements such as grass and trees for people's choice of a restorative environment. Van den Berg et al. (2014) highlighted the importance of the perception of naturalness when assessing an environment's restorative powers, emphasising individual perception and needs as the crucial factor in the restorative effect of urban public spaces. Similarly, Gobster and Westphal (2004) identified naturalness as one of six dimensions to the perception and use of the Chicago Riverwalk greenway. The other dimensions identified by Gobster and Westphal (2004) were the cleanliness, aesthetics, safety, access, and appropriateness of the development.

Of the possible models for explaining how physical and psychological health relates to access to green spaces, a socio-ecological framework is the most appropriate (Lachowycz and Jones, 2013). Within such a framework, the characteristics of green space and the demographic and lived contexts of its users are identified as potential moderating factors for health benefits. The characteristics of green space stem from both its physically measurable aspects and individuals' perceptions of those different aspects. Several studies have identified the importance of demography in this, reporting differences born of gender and age with regards to the health benefits of urban green space (for example, Bedimo-Rung et al., 2005; Richardson and Mitchell, 2010).

Numerous studies have thus established the benefits of the natural environment on human health and well-being, pointing to the positive effects of nature on physiological, psychological, social, and cultural variables (for surveys of the field see, for example, Bowler et al., 2010; Abraham et al., 2010; Hartig et al., 2011; Sandifer et al., 2015; Dzhambov and Dimitrova, 2014). Access to green space is a key factor in being able to tap its psychological and physiological benefits. With regards to access, it is perceived access (which often varies between user groups, and is linked to opportunity, motivation, and ease of use, see Lachowycz and Jones, 2013) that has been found to be more important than the more readily measured geographical access or proximity (Wang et al., 2015; Koppen et al., 2014).

Some studies have reported gender differences in perceptions and use of green space (Cohen et al., 2007; Jorgensen et al., 2002; Kaczynski et al., 2009; Schipperijn et al., 2010; Tyrväinen et al., 2007), but their findings are in many ways as much dependent on the country in question as on perceived accessibility. In their study of eight public parks in Los Angeles, Cohen et al. (2007) found that women were far less represented in urban parks than men, and were less likely to engage in vigorous physical activity there. In a postal survey carried out in Odense, Denmark, Schipperijn et al. (2010) observed that women scored higher than men on the importance of all predefined activities in urban green spaces; a study by Tyrväinen et al. (2007) of urban forests in Helsinki, Finland, showed a similar pattern, with women more likely than men to emphasise the importance of recreational and health benefits. Kaczynski et al. (2009) showed in a Canadian study that living in proximity to a larger number of parks and parkland correlated more strongly with women's activity than with men's. Both Mowen et al. (2005) and Jorgensen et al. (2002) found gender to affect the perceived safety of urban green spaces. Several studies have confirmed that the gender of respondents determines how they rate their preferences in relation to safety in urban green spaces (for example, Mowen et al., 2005; Jorgensen et al., 2002). A study by Ode et al. (2009) showed that gender—but not age—had an effect on people's preferences for different degrees of naturalness. A French study of conservation design (Caula et al., 2009) found gender to be a predictor of preferences

for the natural or ornamental design of green spaces, with women preferring the more natural designs.

There have also been studies of age's relevance to perceptions and uses of urban green space (Bell et al., 2003; Jorgensen and Anthopoulou, 2007; Mäkinen and Tyrväinen, 2008; Payne et al., 2002). In a study of Odense, Denmark, Schipperijn et al. (2010) found a link between gender and age, at least up to the age of 80: with increasing age, men were far more likely to visit green spaces at least a few times a week. Kaczynski et al. (2009) showed there was a stronger relationship between activity levels and living near parks or parkland in younger (18–34) and older (55+ years) groups than in other age groups. Payne et al. (2002) found age to be a strong predictor of park preferences and behaviour in relation to a large park, with old people being less likely to visit. With age there are also likely to be different constraints that limit visits to urban green spaces (Mowen et al., 2005). Kienast et al. (2012) suggested that advancing years increasingly became a factor in choosing distinct landscape characteristics for recreation. One explanation put forward for the greater importance of green spaces to women, the young, and the elderly is that they often spend more time in or near their home environment (de Vries et al., 2003).

Plenty of the previous research using surveys has focused on the use and perception of green space without focusing on a specific local green space but rather the general use of green spaces within a city (e.g. Schipperijn et al., 2010; Tyrväinen et al., 2007). There has been limited amount of surveys focusing on the use, perception and well-being linked to specific neighbourhood green space, which would allow us to specifically explore the contribution different type of green space has to cultural urban ecosystem services.

That being so, the aim of the present study is to investigate the importance of neighbourhood green spaces to local people's use, perception, and self-reported well-being, and any links to cultural urban ecosystem services. We have also explored the influence of demography (gender and age) and the green spaces' naturalness for people's use, perception, and well-being. To do so, we have surveyed local residents living in the vicinity of green spaces of various types in one city (Gothenburg) using a postal survey, thereby including both local users and non-users (which is not the case with *in situ* surveys). In line with the literature on the positive relationship between nature and health and well-being (Bowler et al., 2010; Abraham et al., 2010; Hartig et al., 2011; Sandifer et al., 2015), the MEA's prediction of a positive link between UES and well-being (2005), and the demographic differences in the use of UES (Cohen et al., 2007; Jorgensen et al., 2002; Kaczynski et al., 2009; Schipperijn et al., 2010; Tyrväinen et al., 2007; Bell et al., 2003; Jorgensen and Anthopoulou, 2007; Mäkinen and Tyrväinen, 2008; Payne et al., 2002), we anticipated that residents' activities, aesthetic perception, and well-being relative would vary with their gender and age and the naturalness of the UES experience. Indeed, a UES experience might be viewed as a component in a person's favourite places ('places of mine', Knez, 2014), so affecting a person's well-being in a self-regulating way (Korpela, 1992; Korpela and Hartig, 1996; Knez, 2006).

2. Method

2.1. Sample

Gothenburg, on the Swedish west coast, is the second largest city in the country, with a population of roughly 500,000 and an area of 448 km² (57°42'N, 11°58'E). It is predicted that the city proper will have 150,000 more residents by the year 2035 and the metropolitan area is expected to reach 1 million in 2017 (Göteborgs stad, 2014). The city authorities are actively planning for the conurbation to become more dense. In the study we focused

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