



# Preferences for cultural urban ecosystem services: Comparing attitudes, perception, and use



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## ABSTRACT

Urban green spaces, including parks, provide numerous ecosystem services (ES) for city inhabitants. Besides provisioning and regulating services, they also provide cultural services by giving people opportunities to recreate and experience nature in the city. The focus of this paper is on cultural ES provided by urban parks in four European cities (Berlin, Stockholm, Rotterdam, and Salzburg). We compare attitudes towards ES provision, perception, and use of urban parks. In particular, we compare the perception of several park characteristics to their stated importance for park visitors. Results indicate that there are similarities between cities regarding attitudes towards ES provision and the importance of different park characteristics for visitors. Park use patterns such as the share of regular park visitors or the activities carried out, however, vary significantly between cities. The city-specific context, including park availability, quality, and perception but also the inhabitants' preferences for cultural ES and existing substitutes, is thus crucial for urban planning.

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## 1. Introduction

Approximately 75% of today's European population lives in urban areas (World Bank, 2013). One important element for their well-being and quality of life is the availability of urban green spaces. Urban green spaces, including parks as one important component, provide numerous ecosystem services (ES) for city inhabitants (Bolund and Hunhammar, 1999; TEEB (The Economics of Ecosystems and Biodiversity), 2011). These services are “the direct and indirect contributions of ecosystems to human well-being” (TEEB (The Economics of Ecosystems and Biodiversity), 2010) and consist of provisioning, regulating, cultural, and supporting services. Cultural ES, which are probably the most relevant ES in urban environments besides regulating services (see, e.g., Jim and Chen, 2006), encompass tourism, recreation and physical and mental health as well as aesthetic appreciation, inspiration, education, and spiritual experiences (MA (Millennium Ecosystem Assessment), 2005). Opportunities to recreate are of particular importance for the well-being of city inhabitants who live in a stressful and hectic urban environment (Bolund and Hunhammar, 1999). This view is supported by evidence from the psychological and medical literature which shows that urban green spaces significantly

enhance human health and well-being (see Tzoulas et al. (2007) for an overview).

This paper focuses on urban parks, a main component of urban green spaces, and the ES they provide. We compare attitudes towards ES provision, perception, and use of urban parks among the inhabitants of four European cities, namely Berlin (Germany), Stockholm (Sweden), Rotterdam (The Netherlands) and Salzburg (Austria). Focusing on one component of urban green spaces allows carrying out a consistent analysis of preferences and uses as other types of urban green spaces (e.g., forests or cemeteries) may be used differently.

Given the focus of our study on attitudes towards ES provision, perceptions, and use of urban parks, studies that have dealt with one or more of these aspects before are most relevant for putting our analyses in context<sup>1</sup>. One example for such a study is Chiesura (2004), who analyzes people's reasons for and perceived benefits of visiting urban parks. Examples for studies that focus on the use and perception of urban parks include Zhang et al. (2013), Özgüner, 2011 and Lo

<sup>1</sup> An extensive amount of documents exists looking at urban green spaces in general. Documents relating to urban parks, however, often have been published on the national or local level and are targeted at the general public (see Konijnendijk et al., 2013 for a review on the benefits of urban parks). In the following, we focus on contributions in peer-reviewed journals. Note, that some of the studies mentioned in the following use the terms urban green spaces and urban parks interchangeably, but mostly refer to urban parks in their analyses as opposed to other forms of urban green such as street trees, residential lawns, or roof gardens, which also count as urban green spaces (Breuste et al., 2013).

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and Jim (2010). Some studies also analyze attitudes towards and/or the perception of urban parks and ES provided by them but leave out actual use (e.g., Bonaiuto et al., 2003; Balram and Dragičević, 2005; Jim and Chen, 2006; Kabisch and Haase, 2014). Other studies analyze preferences for varying types of vegetation, differentiating between different groups of people, for example between residents and landscape planners (Hofmann et al., 2012). Some studies also relate socio-economic characteristics to attitudes towards urban parks, to perception of urban parks or to preferences for park characteristics using statistical tests (Chiesura, 2004; Jim and Chen, 2006; Jim and Shan, 2012) or econometric analysis (Bjerke et al., 2006).

These studies mostly focus on a particular park in one city (e.g., Kabisch and Haase, 2014; Chiesura, 2004) which limits general statements and, furthermore, comparability with other studies due to, for example, differences in survey design and varying degrees of detail. One rare exception is Van Dyck et al. (2013), who analyze neighborhood perception and physical activity in Baltimore (USA), Seattle (USA), Adelaide (Australia) and Ghent (Belgium). The focus of the van Dyck study, however, is different from ours because Van Dyck et al. (2013) focus on physical activity and not on a broader set of recreational activities. Moreover, they do not consider people's attitudes towards ES provision or their perceptions of urban parks. We thus add to the literature by providing a comparative study on people's attitudes towards ES provision, perception, and use of urban parks in four European cities. This allows investigating whether general patterns are observable and to what extent findings are transferable between different locations and across countries. The four cities are interesting examples for comparison because they are quite different with respect to size, location, physical geography, and economic structure. But they are all faced with projected increases of population numbers in the medium term, which might put pressure on existing urban parks<sup>2</sup>.

In addition, many studies that analyze people's preferences for urban parks do not systematically include the ES framework in their analysis. First, this implies that most preference studies about urban parks directly consider recreation without paying attention to the question of how other cultural urban ES such as spiritual experiences and aesthetic appreciation are valued by citizens (e.g., Zhang et al., 2013; Özgüner, 2011). Second, most studies investigating regulating services consider the potential of urban ecosystems such as urban parks to provide these services but they do not ask to what extent this potential is recognized by the citizens (e.g., Bolund and Hunhammar, 1999; Kabisch et al., 2013). While it is important to know the potential of urban parks to provide regulating ES, it is also interesting to find out whether this multi-functionality of urban parks is recognized by the citizens. Jim and Chen (2006) is the only study that we are aware of that investigates to which extent people recognize the importance of different urban ES provided by urban parks and green spaces. We thus add to the literature by showing which services of urban parks citizens recognize and how they value them.

Finally, we relate people's stated importance of park characteristics to how these characteristics are perceived by park visitors in the four cities. If there are differences between what people find important and how parks are designed and equipped, then this will be valuable information for city planners because it informs them which characteristics of urban parks need improvement to meet the needs of the visitors. Subjective information on how people perceive the quality of urban parks may, in addition, help city planners to evaluate whether the measures they have taken fulfil the intended purpose. Some of the characteristics might be more easily altered

(e.g., equipment with facilities such as playgrounds) than others (e.g., distance).

The paper is structured as follows. Section 2 presents main information about the case study cities as well as information about survey content, design, and implementation as well as the statistical methods used for the analyses. Section 3 presents the results, including a description of main demographic characteristics of the sample populations in the four cities and a comparative description of people's attitudes, perception, and use of urban parks in the four cities. Section 4 discusses the results and concludes.

## 2. Data and methods

### 2.1. Case study cities

The case study cities considered in this paper are Berlin (Germany), Stockholm (Sweden), Rotterdam (The Netherlands), and Salzburg (Austria). Key demographic, geographic, environmental, and economic characteristics of the case study cities are summarized in Table 1. The Maps provided as Online Appendix show the distribution of urban green spaces<sup>3</sup> and other natural and semi-natural areas in the four cities.

#### 2.1.1. Berlin

Berlin is the capital city of Germany. It is a City State located in the east of Germany forming the center of the metropolitan area of Berlin-Brandenburg. Berlin covers an area of 892 km<sup>2</sup> (SSUB (Senatsverwaltung für Stadtentwicklung und Umwelt Berlin), 2013a), of which 7.4% are covered with green urban areas, 17.5% are forests, 7.2% are agricultural areas, and 5.6% are rivers and lakes (see EEA (European Environment Agency) (2012) and Fig. 0–1 in Online Appendix). The green urban areas are composed of more than 3000 facilities, including parks, smaller green areas, recreation areas, and playgrounds (SSUB (Senatsverwaltung für Stadtentwicklung und Umwelt Berlin), 2013b). Overall, 37.7% of the city is thus covered by natural areas. Most of the forest, agricultural, and water areas, however, are located in the outer districts of the city, while smaller green urban areas are spread over the whole city. Berlin had a total population of 3.50 million as of December 2011 (ASBB (Amt für Statistik Berlin-Brandenburg), 2012). The overall population is estimated to peak at around 3.76 million in 2030, above all due to medium-term positive net in-migration (SSUB (Senatsverwaltung für Stadtentwicklung und Umwelt Berlin), 2012).

#### 2.1.2. Stockholm

Stockholm is the capital city of Sweden and is located on 14 islands in east central Sweden, covering a land area of 187 km<sup>2</sup>. The city is characterized by its location between Lake Mälaren and the Baltic Sea and the resulting large share of water area within the city. Total area, including water areas, is approximately 216 km<sup>2</sup> (City of Stockholm, 2012a). Green urban areas cover 17% of the city, 10% are forests, and 3% are agricultural areas (see EEA (European Environment Agency) (2012) and Fig. 0–2 in Online Appendix). Around 1000 parks (EC (European Commission), 2008) and seven nature reserves are located in Stockholm; 7.0% of the total area are designated as environmental protected areas (City of Stockholm, 2008). Stockholm was awarded as the first

<sup>2</sup> In addition, these four cities are the main case study cities in the international research project URBS (Urban Biodiversity and Ecosystem Services; [urbesproject.org](http://urbesproject.org)) so that more comparative evidence on urban ES in these cities can be expected to be generated.

<sup>3</sup> The land use category "green urban areas" in the Urban Atlas (EEA (European Environment Agency) 2012) includes public green areas for predominantly recreational use such as gardens, zoos, parks, or castle parks. Not included are private gardens within housing areas, cemeteries, buildings within parks, such as castles or museums, patches of natural vegetation or agricultural areas enclosed by built-up areas without being managed as green urban areas (EU (European Union), 2011). There is no comparable data set specifically for urban parks for the four case study cities, but parks make up the major part of the land use category "green urban areas" in the Urban Atlas, which is why we chose this data set for an illustration.

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