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Human–environment interactions in urban green spaces — A systematic review of contemporary issues and prospects for future research

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ABSTRACT

Scientific papers on landscape planning underline the importance of maintaining and developing green spaces because of their multiple environmental and social benefits for city residents. However, a general understanding of contemporary human–environment interaction issues in urban green space is still incomplete and lacks orientation for urban planners. This review examines 219 publications to (1) provide an overview of the current state of research on the relationship between humans and urban green space, (2) group the different research approaches by identifying the main research areas, methods, and target groups, and (3) highlight important future prospects in urban green space research.

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Introduction

Industrialised cities in the developed world have been trying to integrate sustainable ecological, social, and economic dimensions in all fields of urban development (Bunce, 2009; Haase et al., 2010). Among these dimensions, the development of green space has played an

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important role (Szulczewska et al., 2014). Population growth in cities, however, is challenging to urban green space development because of the focus on re-densification policies in inner city areas. In developing countries, the pressure from population growth is far more impressive (United Nations, Department of Economic and Social Affairs, 2013). Ongoing urbanisation leads to the spread of urban space and converts open land to residential areas, while green space development is not considered. As a result, urbanisation and interlinked densification processes around the world result in residents with unequal access to urban green space and to the environmental and social benefits that such green spaces provide.

An increasing number of studies highlight the environmental and social benefits related to green space as being important to mitigating urbanisation-induced environmental effects and increasing the quality of life of citizens. In these studies, urban green space is defined as a range of parks, street trees, urban agriculture, residential lawns, and roof gardens (Breuste et al., 2013). The studies focus mostly on one benefit or related specific benefits, including the following:

a) mental and physical health benefits (Coley et al., 1997; Maas et al., 2006, and others);
b) economic benefits such as increased real estate prices because of green spaces in the vicinity (del Saz Salazar and García Menéndez, 2007; Jim and Chen, 2006; Tajima, 2003 and others);
c) social benefits such as supporting social interaction and integration (Smith et al., 1997 and others); and
d) environmental benefits such as climate mitigation potential in the form of cooling through shade provision and moisture (Lafortezza et al., 2009; Spronken-Smith and Oke, 1998), noise reduction (Bolund and Hunhammar, 1999) and air filtration of pollutants (Escobedo and Nowak, 2009; Jim and Chen, 2008) through trees or the promotion of biodiversity (Fuller et al., 2007).

In addition, some structural reviews on the specific benefits of urban green space have been published over the last few years. Konijnendijk et al. (2013) presented the relationship between urban parks on one side and health, biodiversity, tourism, social cohesion, and urban climate and water regulation on the other. Milcu et al. (2013) discussed the diversity of research on cultural ecosystem services, where urban green spaces are identified as suppliers of these services. Byrne and Wolch (2009) and Gentin (2011) examined recent geographic perspectives on park use, drawing especially on environmental justice and ethnicity, respectively, in the U.S. and European contexts.

Apart from the number of published studies and reviews in urban green space research, no structured overview of research findings on the benefits of green space exists. Most of the reviews being published focus more on the pattern of publications (e.g. their number, year, and regions) but they neither use any (semi-)quantitative approach(es) to outline the prospects for future research highlighting a set of clear objectives specifically focusing on cross-thematic (multidisciplinary) approaches applied to cross-city intercontinental case studies nor do they refer so specifically to urban planning.

A general understanding of the contemporary issues in human–environment interactions in urban green space is still incomplete and lacks direction for planners and decision makers. Thus, a synthesis of the main research findings could help city planners understand the benefits related to green space in their part of the world. Urbanisation may then proceed, but with a more balanced view on sustainable development of the urban environment, which takes into account the city residents and their quality of life.

The main objectives of this paper are as follows:

(1) to provide an overview of the current state of research on the relationship between humans and urban green space,
(2) to group the diversity of research approaches by identifying the main research areas, methods, and target groups, and
(3) to highlight important future prospects in urban green space research.

Methods

General approach

We focused on peer-reviewed articles that were published in international scientific journals. Studies that were published in national reports or local planning documents or similar "grey" literature were not part of this review, although they may have enriched the depth of research. We developed our review using the best available evidence as published according to good scientific practice. Our review considers articles published between 1 January 2000 and 1 October 2013. We decided to focus on this period because relevant studies have been extensively published in overwhelming numbers since 2000. The reason for this boom in urban green space research is an increased attention paid to how people interact with urban nature of green spaces for their health and social wellbeing within Europe. In this context, major EU research funding programmes (5th framework period 1998–2002) were started to prioritise research on urban green space and the social, environmental, and planning aspects related to them. Projects such as URGE (development of Urban Green spaces to improve the Quality of Life in Cities and Urban Regions; duration 2001–2004) were among the first large-scale, funded research projects investigating urban green space in several cities as comparative cases to develop a unified multidisciplinary framework. All these funded projects had a sort of pre-condition (they were motivated) of involving local authorities (e.g. municipalities, city councils or district authority) as major partners within the project. It was to make sure that the scientific research by academia is ready for its applicability within local decision making and urban planning. In this context, a participatory approach was also used by the URGE partners including stakeholders and local communities. This approach resulted in multidisciplinary toolkits for spatial green space planning. Thus, as a direct consequence of the URGE project, such local actions helped to initiate programmes of public awareness on green spaces.

Our objective was to devise a systematic procedure of literature selection and analysis that should be replicable (Konijnendijk et al., 2013). The ISI Web of Science© and Scopus© were used as scientific search engines to find the appropriate literature. The search terms were entered using the categories 'title, abstract, and keywords' for Scopus and 'Topic' for the ISI Web of Science. The search profile was based on a number of primary search terms, which can be divided into two groups. One group referred to urban green space. The second group showed the relationship of the quality of life and social benefits, i.e., the human–environment interactions within urban green space (Table 1). These terms were chosen based on our own knowledge and initial literature studies that showed major relationships in these groups. We restricted our search to articles published in English.

After the initial search, articles were screened and excluded if the content of the title or abstract did not match the main research objectives. For example, papers that had a sole natural science background with no relationship to a social component or benefits of urban green space were excluded. The remaining papers were subsequently reviewed according to pre-designed categories. If a paper was further evaluated as not relevant (e.g., if the paper was a review or had no social component), the paper was excluded from the study. A standardised data extraction sheet for systematic review was used by the authorship team for the final review. This standardised data extraction sheet ensured controlled data retrieval and analysis across all selected papers. The review of papers was shared equally by the three authors, while the primary author performed a final check of all of the papers to ensure a minimum equal evaluation for the papers and to have as little assessment bias as possible.