



## Research paper

## Woodland improvements in deprived urban communities: What impact do they have on people's activities and quality of life?

Catharine Ward Thompson<sup>a,\*</sup>, Jenny Roe<sup>b,1</sup>, Peter Aspinall<sup>b,1</sup><sup>a</sup> OPENspace Research Centre, University of Edinburgh, 74 Lauriston Place, Edinburgh EH3 9DF, UK<sup>b</sup> School of the Built Environment, Heriot-Watt University, Edinburgh EH14 4AS, UK

## HIGHLIGHTS

- ▶ An intervention to improve urban woodland in a deprived UK community was assessed.
- ▶ A before-and-after study of intervention compared with a non-intervention site.
- ▶ The intervention was associated with greater levels of woodland use.
- ▶ Positive associations with perceptions of environment and quality of life.
- ▶ Environmental interventions such as this may be effective for deprived communities.

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## ABSTRACT

Green space in the residential environment is associated with a range of health benefits but there is very little evidence on the impacts of environmental interventions in nearby green space on patterns of use, physical activity, or perceptions of the neighbourhood environment. This paper presents the results of a study involving a natural experiment: improvements under the Woods In and Around Town (WIAT) programme in a disadvantaged urban community, compared with a similar community without environmental interventions in local green space, both in Glasgow, Scotland. A repeat cross-sectional survey of the community resident within 500 m of the local woodlands or green space ( $n = 215$ ) used a quota sampling framework based on each community's demographic profile. Outcome measures included perceptions of neighbourhood quality of life, neighbourhood environment, and local woodland qualities, frequency of woodland visits and levels of outdoor physical activity. Results show highly significant ( $p < 0.001$ ) difference over time in the intervention site in perceptions of the quality of the physical neighbourhood environment, an indicator of quality of life. The research also found significant differences in woodland use ( $p < 0.001$ ), in the frequency of summer woodland visits ( $p < 0.05$ ), in attitudes to woodlands as places for physical activity ( $p < 0.01$ ) and in perceptions of safety ( $p < 0.05$ ) in the intervention site over time, compared with no significant change in the comparison site. We conclude that environmental interventions in deprived urban locations can positively impact on use patterns, perceptions of environment and, potentially, activity levels and quality of life.

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## 1. Introduction

A growing body of research has demonstrated a relationship between the availability of green space or natural areas to different populations and their health and wellbeing. These studies range from national level epidemiological research (Bjork et al., 2008; de Vries, 2003; Maas, Verheij, Groenewegen, de Vries, & Spreeuwenberg, 2006; Mitchell & Popham, 2008) to very localised

case studies (Grahn, Ivarsson, Stigsdotter, & Bengtsson, 2010) and experimental studies (Hartig, Evans, Jamner, Davis, & Gärling, 2003). The principal mechanisms proposed for the positive relationships between access to natural environments and health are: physical activity undertaken while experiencing natural environments; social contact made possible or enhanced within such places; and independent physiological and psychological responses to perceiving natural environments themselves (de Vries, 2010), some or all of which may impact on mental health and relief from stress (Ward Thompson et al., 2012).

Epidemiological studies based in urban settings point to the relationships between access to natural environments and health being stronger among deprived populations (Mitchell & Popham, 2008). Within deprived social housing communities in Chicago,

\* Corresponding author. Tel.: +44 131 651 5827.

E-mail addresses: [c.ward-thompson@ed.ac.uk](mailto:c.ward-thompson@ed.ac.uk) (C. Ward Thompson), [j.roe@hw.ac.uk](mailto:j.roe@hw.ac.uk) (J. Roe), [p.a.aspinall@hw.ac.uk](mailto:p.a.aspinall@hw.ac.uk) (P. Aspinall).<sup>1</sup> Tel.: +44 131 451 4629.

research has consistently shown the benefit of green space to different measures of wellbeing, including reduced local crime and aggressive behaviour (Kuo, 2001; Kuo & Sullivan, 2001a, 2001b). Recent research in Scotland suggests a similar relationship may exist for certain deprived populations (Ward Thompson et al., 2012). A review by Bowler, Buyung-Ali, Knight, & Pullin (2010) shows positive emotional and attentional benefits from exposure to natural environments but less evidence for physiological benefit. However, Hillsdon, Jones, & Coombes (2011) found good access to urban green spaces associated with higher use and physical activity levels; perceptions of safety were important for green space use and higher physical activity levels were principally associated with formal green spaces as opposed to more informal or natural areas such as woodlands. This points to a need to understand better how the *quality* of the physical environment (and green space in particular) in a person's local neighbourhood impacts on quality of life and on measurable health outcomes (Sugiyama, Francis, Middleton, Owen, & Giles-Corti, 2010; Sugiyama, Leslie, Giles-Corti, & Owen, 2008; Ward Thompson & Aspinall, 2011). The UK National Institute for Clinical Excellence (NICE, 2008) has highlighted the lack of good quality, longitudinal evidence on the impact of changes made to the natural environment on healthy activity, and the need for more research on different populations, environments and social contexts. There have been relatively few, well designed pre- and post-intervention studies to date; this exploratory study aims to contribute to better evidence in this emerging area of research.

### 1.1. Quality of environment, wellbeing and quality of life

An exploration of the relationship between urban environmental quality and human wellbeing (van Kamp, Leidelmeijer, Marsman, & de Hollander, 2003) concluded that there was a lack of consensus on fundamental questions such as how meta-concepts of 'livability', 'quality of life', 'quality of place' and 'sustainability' were related to each other. A more recent UK study (Campbell, Bodley, & Berkley, 2007) identified personal factors (such as health, income coping, and relationships with family and friends) as most important to quality of life but the quality of the neighbourhood was also identified as a key factor, including the availability of parks and green spaces, along with neighbourhood appearance and feeling safe, a sense of belonging and community spirit. A review of the quantity, quality and use of green space across England (CABE, 2010) showed a strong link between people's satisfaction with their local parks and open spaces and their satisfaction with their neighbourhood. Deprived populations had a far worse provision of parks and green spaces (both in quantity and quality) than their affluent neighbours and, correspondingly, neighbourhood satisfaction was at its lowest in the most deprived areas. There is evidence that deprived populations in Scotland suffer similarly (Macintyre, Macdonald, & Ellaway, 2008).

### 1.2. The context for the study

Glasgow, Scotland, is a particular focus of interest for studies of inequalities in health and quality of life because, while some aspects of health are improving, the gap in life expectancy between the most affluent and deprived areas has shown signs of increasing in recent years (Gray, 2007, 2008). Glasgow City has higher mortality rates than other UK cities suffering from similar levels of deprivation (Walsh, Bendel, Jones, & Hanlon, 2010).

As studies cited earlier have indicated, green space has the potential to provide an important, health-promoting resource for people in urban areas. However, since Glasgow has more green space per square mile than any other UK city (Glasgow Economic Partnership, 2011), quantity of green space alone does not appear sufficient to enhance health across the city (Seaman, Jones, &

Ellaway, 2010). Quality of life across the city is low compared to other Scottish cities, (36% in Glasgow rated their neighbourhood as "a very good place to live", compared to 50% in Edinburgh in 2007/2008 (Glasgow Economic Partnership, 2011)), and access to good quality green space varies locally. Macintyre et al. (2008) found income inequalities in Glasgow in accessing green space: wealthier areas had more access to parks and bowling greens while poorer areas had more outdoor play areas and more vacant or derelict land. A separate study of Glasgow's green space (Jones, Ellaway, Seaman, Kendall, & Truman, 2008) found considerable variation in the quality of facilities, with residents in more deprived areas perceiving their local neighbourhood to be more unattractive and a heightened sense of individual risk and danger in using public space.

In the light of such evidence, a key driver of our study was to explore how improving the quality and accessibility of an urban green space might contribute to improved quality of life and wellbeing for a deprived urban community in Glasgow. The study was designed around an environmental intervention in the form of improvements to community woodlands under the Forestry Commission Scotland's WIAT (Woods In and Around Towns) scheme. WIAT works with very deprived communities to regenerate local woods and promote them as safe and accessible places for enjoying the outdoors, with the ultimate aim of improving health and quality of life in towns and cities.

The WIAT intervention programme involves investment to bring woodlands into sustainable management and improve recreation facilities through a programme of work developed in consultation with the local community. Engagement with the woodland improvements is promoted via community events (see Forestry Commission Scotland, 2010, for details). Typical physical interventions under WIAT include clearing of rubbish and signs of vandalism and the construction of improved footpaths, signage and entrance gateways. They also involve silvicultural work to improve the appearance and safety of trees and vegetation, including clearing sightlines along pathways to extend visibility and views. Publicity and group-based activities are also used to encourage knowledge of the woodlands and opportunities for its use.

### 1.3. The study aims

The research described here was designed to take advantage of this green space intervention to explore how changes to the urban woodland environment might impact on perceptions of, and visits to, the woodlands, and whether these were reflected more broadly in individual levels of activity and quality of life in the community. Fig. 1 describes the potential pathways from environmental intervention to health and neighbourhood quality of life.

The particular questions addressed in this study were:

- Is the WIAT intervention associated with improved community perceptions of quality of environment and quality of life?
- Is the WIAT intervention associated with greater use of local woodlands and is this reflected in greater levels of outdoor physical activity in the community?
- What other differences in perception or experience of local woodlands are associated with the WIAT intervention?

## 2. Methods

### 2.1. Ethics

This study was carried out in accordance with the British Psychological Society 'Ethical Principles for Conducting the Research

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