



# A methodological approach to understanding the wellbeing and restorative benefits associated with greenspace



Anna Conniff\*, Tony Craig

The James Hutton Institute, Craigiebuckler, Aberdeen AB15 8QH, Scotland, UK

## ARTICLE INFO

### Article history:

Received 30 September 2014  
Received in revised form 5 May 2016  
Accepted 21 June 2016  
Available online 5 July 2016

### Keywords:

Eyetracking  
Greenspace  
Psychophysiology  
Sound  
Wellbeing

## ABSTRACT

This paper argues that research into the wellbeing and restorative effects of green spaces has been conducted in what might be described as a modal vacuum. Whilst it is commonly recognised that the outdoor world is one in which our visual, aural, haptic and olfactory senses are engaged, much environmental psychological research into this topic has been conducted using the visual sense only. We present a methodological overview of research that has been conducted either in situ or in conjunction with other modes (primarily aural), and highlight research findings from other disciplines that contributes to our understanding of greenspace wellbeing benefits. Lastly, we outline a research approach that we believe could uncover some of the underlying mechanisms of wellbeing benefits from greenspace. We contend that the use of eyetracking, in conjunction with the presentation of sound as well as visual stimuli, could help unpick the complexities of what exactly it is about certain environments that makes them restorative or not.

© 2016 Elsevier GmbH. All rights reserved.

## 1. Introduction

It is widely accepted that greenspace seems to provide wellbeing benefits for people. While the evidence for the health benefits of greenspace (for example, through the promotion of exercise) remains equivocal, a number of systematic and other reviews have concluded that environments well-populated with natural components such as trees, bushes and grass (greenspace) are beneficial to well-being as a whole (Bowler et al., 2010; Thompson Coon et al., 2011; O'Brien et al., 2010). Studies have shown that when people are psychologically stressed or fatigued (a mental state often associated with modern working practices), they recover quicker in environments rich in natural features compared to those environments that are predominantly built or lacking in natural features (Ulrich et al., 1991; Hartig et al., 1991; Berman et al., 2008). Two complementary theories, Kaplan's Attention Restoration Theory (Kaplan and Kaplan, 1989; Kaplan, 1995) and Ulrich's Stress Recovery Theory (Ulrich, 1983; Ulrich et al., 1991), have been developed to explain why certain types of natural environments are beneficial to humans. Broadly speaking, Kaplan's theory focuses on cognition while Ulrich's theory focuses on affect, but both are in agreement

that environments rich in greenspace restore directed attention and foster stress reduction.

The mentally restorative benefits of greenspace are addressed by Attention Restoration Theory (ART) (Kaplan, 1995), which posits that when our ability to direct our attention to cognitively demanding tasks becomes depleted, our attentional resources can be restored most rapidly and effectively in environments that are composed of 4 particular components: Being Away, Extent or Coherence, Fascination and Compatibility. Being Away refers to distance (both geographical and psychological) from an individual's usual environment and routines. Extent or Coherence can be conceptualised as the environment having *sufficient scope to sustain exploration*. Fascination is defined as the degree to which aspects of the environment capture involuntary, effortless attention (also referred to as 'soft' fascination). Compatibility refers to the match between the capacity of the environment to deliver the individual's intended activity in the space. The four components together promote involuntary attention and allow an individual the opportunity to restore from directed attention fatigue, such as might be experienced in a stressful job, for example. Many natural environments rich in green features such as grass, trees and bushes feature these components to a large degree.

Ulrich's Stress Recovery Theory (SRT), or psycho-evolutionary theory, argues that contact with nature aids recovery from all stress, not just attentional fatigue, and that the response to nature is based on affect, not information processing. This argument maintains that

\* Corresponding author.

E-mail address: [anna.conniff@hutton.ac.uk](mailto:anna.conniff@hutton.ac.uk) (A. Conniff).

natural settings can promote emotional states of wellbeing that can be detected through both psychological (e.g. emotional responses) and psychophysiological responses such as heart rate, blood pressure and skin conductance.

A great deal of research has been conducted over the last 30 years that has provided empirical support for both ART and SRT. While some research has been conducted in situ, in natural or wild environments (e.g. Kaplan and Kaplan, 1989; Hartig et al., 1991), the majority has been conducted under controlled conditions in experimental laboratories, often using slides or photographs as surrogates for the real world (e.g. Han, 2003; Herzog et al., 2003; Staats et al., 2003; Berto, 2005; White et al., 2010 etc.). The validity of using photographic material to represent the real world has been meta-analysed by Stamps (1990), who concluded that photographs do have representational validity. However, important differences have been demonstrated between representational and experiential validity (as summarised, for example, by Daniel and Meitner, 2001) which will be highlighted in the remainder of this paper.

This paper reviews research that demonstrates the effects that sound can have on people's perceptions of the environment around them, and questions whether researchers should make more effort to include this medium in future ART and SRT studies. The paper first presents exemplar findings from ART (i.e. cognitive) and SRT (i.e. psychophysiological) studies, focusing on the methodologies that have commonly been used. Then, the effects of sound on scene perception, restoration and physiological response are described. Finally, an argument for the use of eye-tracking methods to help grow our understanding of the effects of sound on a potentially restorative environment is made. An illustrative experimental scenario is outlined and issues surrounding this are discussed.

## 2. Methods used to examine cognitive outcomes

Much research has been conducted by asking people how much they like the visual scenes they are presented with (usually photographs or slides) and how likely they would be to visit such a place (aesthetic and behavioural preference measures). In order to establish the likelihood of an environment affording attentional restoration, many studies have also used (versions of) the Perceived Restorativeness Scale (PRS), initially developed by Hartig et al. (1996). The PRS consists of 5 subscales that build on the restorative experience conditions described previously as Fascination Being Away, Coherence, Compatibility, with the addition of Legibility (the inferred understanding of the environment). Preference and perceived restorativeness studies are often conducted through asking participants to *imagine* themselves being tired or fatigued. Example studies and findings are described below.

- In an early study, Ulrich (1979) demonstrated that viewing photographs of nature scenes is associated with fewer negative feelings and more positive feelings compared to viewing slides of treeless urban scenes.
- Herzog et al. (1997) asked participants to rate photographic slides of natural, sports/entertainment and urban settings on their perceived likelihood of contributing to recovery and reflection (components of restoration). Natural settings had high restorative potential, urban had low, and sports/entertainment settings were judged as falling in between.
- In 2003, Herzog et al. asked participants to rate photographs of different urban or field/forest settings as somewhere they would like to take a break after mental exertion (Perceived Restorative Potential, PRP). Nature categories were preferred, and they found that the restorative components of Being Away and Compatibility provided positive predictors of PRP.

- Purcell et al. (2001) assessed the extent to which perceived restorative effects of different types of scenes are correlated with preference and familiarity. They found that preference and perceived restorativeness correlated closely and that the highest scores were for scenes of hills and lakes, the lowest ones for urban scenes.
- Staats et al. (2003) asked their participants to view slides of either an urban walk or a walk through a forest imagining themselves either refreshed or attentionally fatigued. When imagining themselves attentionally fatigued, preference was stronger for the forest walk.
- Felsten (2009) asked students to rate perceived restorativeness of photographs of digitally altered views from around the campus, and found that nature and water murals were preferred over views with buildings.

Other studies have taken the research approach one step further, and have ensured that participants are *actually* fatigued, rather than simply imagining the state. For example, Hartig and Staats (2006) compared students who were naturally fatigued after having attended a 1.5–3 h lecture, with students who were not fatigued. They showed the two groups a series of slides representing a walk through either an urban or forest environment. Although both groups of students preferred the slides showing the forest walk, the effect was stronger for the fatigued group.

Some have taken a more stringent approach to inducing fatigue by asking participants to engage in cognitive tasks designed to both drain and assess directed attention capacity. For example, Berto (2005) presented participants with photographs of natural and urban scenes after they had been attentionally fatigued via the Sustained Attention to Response Test (SART). The SART requires people to monitor long sequences of numbers and suppress responses to a target stimulus. Berto (2005) found that only participants exposed to the natural scenes regained their attentional capacity to a sufficient degree to perform well on the post-test.

Some studies have investigated the effect of the visual environment without making specific reference to that environment. In a study designed to measure emotive response to stressful computer-based tasks in an office decorated with different types of posters (nature, abstract, nature and abstract, or none), Kweon et al. (2008) used four different computer-based tasks designed to fatigue and frustrate their participants. The Automated Teller Machine Task requires participants to make banking transactions such as withdrawals and deposits, while negative visual and aural feedback and vague instructions are provided. The Angle-Matching Task presents participants with a series of angle cards that must be matched with one of 28 'matches', but none of the matches are exact. Participants are given negative feedback and told that their performance is below average. The Letter Detection Test is a speed matching test with aural feedback that participants are told will disappear if their performance is better than that of previous participants. The noise is never removed. In the Object Tracing Task participants are required to trace an 8-point star using the mouse, but the mouse is programmed to move in random directions and periodically freeze. Negative feedback messages comparing participants to others are presented on screen. The authors found that participants who had undergone these tests in presence of posters showing images from nature demonstrated lower stress and anger effects than those who had undergone the tasks in the presence of the other poster types.

Tennesen and Cimprich (1995) measured the directed attention capacity of students who had either all natural, mostly natural, mostly built, or all built views from their college rooms, and found that natural views from windows enhanced capacity for directed attention compared to those with less natural views, findings echoes by those of Felsten (2009). Directed attention capacity was measured using the Forwards and Backwards Digit Span Test

Download English Version:

<https://daneshyari.com/en/article/93920>

Download Persian Version:

<https://daneshyari.com/article/93920>

[Daneshyari.com](https://daneshyari.com)