Feeling good and feeling safe in the landscape: a 'syntactic' approach

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1. Introduction.

Space syntax is a theory and set of tools and techniques for the analysis of spatial configurations. It was developed at UCL in the late 1970s, as an approach to understanding human spatial organisation and to help architects and urban designers to simulate the likely social consequences of their projects. The fundamental proposition of space syntax is that a building or place can be broken down into spatial components, so that an analysis of the interrelations of the components will yield information about the *pattern* of space that is meaningful and functionally relevant. Over the past thirty years, space syntax has been successfully applied to resolve problems as diverse as master planning entire cities or revealing the imprint of culture in domestic settings.

With this in mind, this paper will explore opportunities and challenges of taking a syntactic approach to the spatial analysis of landscape. To the extent that people avoid walking through landscapes in which they feel apprehensive, understanding the spatial characteristics of such environments should enable landscape designers to create vital landscapes that support healthy lifestyles and avoid those conditions where people may feel insecure. The paper will focus on how the tools/techniques of space syntax can be adapted to understand the circumstances in which people feel motivated to explore their local landscape and the spatial factors that may deter people from incorporating walking into their everyday routines.

2. How space syntax works.

Space syntax is built on three classes of spatial unit, each associated with a different representation: axial lines, convex spaces and visual fields (isovists) (see Figure 1**)**. Movement is essentially a *linear* activity, whereas social interaction requires a *convex* space in which all points can see all others. Finally, from any point in space, it is possible to construct a 360° visual field that describes the area and boundary that can be directly seen from that location. Following Benedikt (1979), space syntax normally uses the term *isovist* (related terms from landscape studies/geography would be *vista* and *viewshed*, discussed in detail by Conroy-Dalton & Bafna, 2003), to refer to these irregularly-shaped slices through the environment. Each of these representations describes some aspect of how people use and experience space practically. A central proposition of space syntax is that there is a link between these representations of space and those observable aspects of functionality.
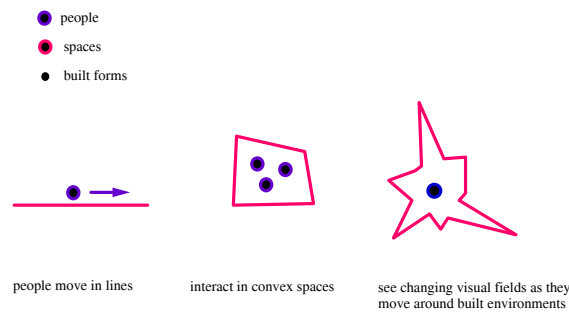
people

spaces

built forms

people move in lines   interact in convex spaces   see changing visual fields as they
move around built environments

Figure 1. The social logic of axial and convex spaces and isovists.

However, the space syntax approach to architectural/urban space is not just concerned with the properties of individual spaces, but with the relationships between the many spaces that form the spatial layout of a building/city. Space syntax uses the term *configuration* to refer to the way in which each space in a layout contributes to how all the spaces in the system affect one another. A fundamental notion of space syntax is that the layout of a network of spaces appears to be different when seen from different locations in the system.

3. The syntactic analysis of landscapes.

Practical applications of space syntax to landscape studies tend to be directed towards promoting the use of green routes and public parks in urban areas through people-aware design. For example, in 2003, Space Syntax Limited, a commercial spin-off company of the university-based research group at UCL, was commissioned to study the use of two Greenways on the outskirts of London. The key spatial factors that seemed to influence the observed levels of activity on the Greenways were integration, visibility and co-presence (Rose, 2003). Similarly, a detailed observation study of the use of a local Thames-side park in the heart of London (Savic & Rose, 2003), found that whilst routes at the perimeter of the park were well used, those in the heart of the park were less busy.

Studies of a similar nature have been carried out in several parts of the world (Baser, 2007; Grajewski & Psarra, 2001; Guler, 2007; Makhzoumi et. al., 2005, Papargyropoulou, 2006). A common theme in many of these studies is the relationship between visibility (what can be seen), accessibility (where people can go) and observed use and movement (where people actually are). An intriguing insight (Papargyropoulou, 2006) is that the spatial configuration of a parkland setting may be unique in respect of the freedom of choice that it offers its users in terms of where to go, what to look at and who else is co-present with the observer in the visual field.

With respect to issues of visibility, interesting work is being done to develop an algorithm to express the probability that a target object really can be seen from a given location in the landscape, a factor termed '*probabilistic visibility*' (Skov-Peteren & Snizek, 2007a, 2007b). Building upon an earlier study of the landscape of Queensland (Preston 2002), the authors propose that when analysing visibility in small-scale landscapes using visual fields, factors such as the ruggedness of the terrain, the presence of ground-level planting and even the weather and light

conditions might interfere with visual contact. They have proposed, therefore, a measure of *'visibility decay'* that takes account of the physical distance between the viewer and the target, the relative transparency of the environment and the viewing angle; these ideas were tested empirically in a field study located in a beech forest setting.

4. Spatial analysis.

The question that this paper will begin to explore is whether the kinds of objective, configuration-based analyses, typically employed by space syntax researchers, can be brought to bear on the problem of representing and understanding the role of the natural landscape. We shall attempt to demonstrate how certain space syntax techniques may begin to be adapted/extended as well as to outline a strategy for future research. It is proposed that there are, broadly, three ways in which space syntax methods may be applied to the study of natural landscapes; these can be characterised as 'assigning attributes to spatial units' (or the nodes in the graph-based representation), 'assigning attributes to the relationships between spatial units' (or the edges in the graph) and the use of multi-layered graphs. Some of the goals of these tactics are to be able to account for the seasonal variation found in the natural landscape, the imprecise nature of natural boundaries and the multiplicity of types of path and/or use.

The next step is to pilot the modified and extended 'syntactic' representations and measures described above, to see if any accord with people's reported experiences. It is clear that the way forward should include a synthesis of three types of expertise: an ability to objectively quantify natural spaces (contribution of space syntax), environmental/cognitive psychology methods of, for example, verbal protocols and other forms of self-reporting in order to attempt to elicit the types of affordances provided by the natural landscape, and knowledge of the landscape itself, providing structured methods of classification and evaluation. This paper ends with a plea for future, interdisciplinary collaboration, as this will provide the best opportunity to understand the reasons why people are reluctant to make full use of the natural environment, and hence feel both good and safe in the landscape.

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