O R A L P A P E R

Space syntax in a wayfinding task

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This research aims to deepen the relationship between environmental characteristics and wayfinding behaviours, by comparing, throughout a wayfinding task, typical *transport models* parameters, such as distance, and *space syntax analysis* parameters, such as the number of the streets.

Since from Lynch's (1960) seminal work, urban environments are defined in terms of *nodes, paths, landmarks and boundaries*. Starting from a *node-link* representation, the purpose of *Transport models* (Wegener 2004) is to preview the flows and the different wayfinding behaviours in urban environments, finding out the shortest ways regarding distance and time. These two elements are often discrepant because of the effect of different parameters such as traffic and crowding.

Space syntax (Hillier and Hanson 1984) is a technique of morphologic analysis of space and his elements such as buildings and urban areas. It is based on the analysis of relational quality of space, with the aim to study the distance between the important elements who constitute urban settings. It also represents a useful instrument for the analysis and the improvement of social quality of urban and architectural projects (Teklenburg et al. 1992). The Syntax concept, derived from linguistic studies, is related to the pattern production and refers to the dynamic relationship across different spaces or between spaces and society.

Space Syntax Analysis has been proven predict wayfinding by showing a correlation between integration values of urban spaces and the movement of people within them.

The concept of integration reflects a measure of connection patterns that constitutes the greater reference parameter for the syntactic analysis of space.

In this way integration can be seen as the measure in which any element of the space support or impede the individual level of accessibility as well as the level of accessibility of other environmental elements.

From the theoretical point of view Space Syntax was recently compared with the traditional Transport models (Ratti 2004; Hillier and Penn 2004), though it was pointed out that these two models are based on different system of environmental representation: Transport models are characterized by node-link representation, whereas Space Syntax is based on the axial map, which is a graphic representation of the environment highlighting the morphologic structure of an urban area as starting point to describe spatial configuration.

Recently, Steadman (2004) noticed that the present discussion about the two different approaches, brings an important empirical question that is not yet enough studied, i.e. the strategies used to *navigate* and reach destination in urban environments.

Do we travel through shortest routes (in terms of metrical or temporal distance) as proposed by transport models, or do we choose the route characterized by the shortest number of axial lines and the highest level of integration?

In order to provide some answers to this question we carried out a pilot study which include a navigation task (intending navigation "as a coordinated and goal-directed movement through the environment by organism or intelligent machines": Montello 2005) to be performed by using a computer software.

A video was realized for any segment of the streets within

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a neighbourhood of the city of Cagliari, for any possible direction (entrance and escape). Digital photos were realized for every node and possible direction.

The video and the digital photos were used to build the software (with the aid of a PC expert), which reproduces the neighbourhood in any of its parts.

The neighbourhood was chosen since it allows a pedestrian navigation, in order to eliminate the effect of traffic-related variables, such as slowdowns, one way streets, etc.

The participants were asked to realize a wayfinding task, in a route perspective, i.e.: "the process to determine and follow a path or a route between an origin and a destination" (Golledge 1999, p. 6). The task was to reach a destination "Z" starting from a point "A". Anytime they reached a node, subjects could choose any direction, including the possibility of turning back.

Research participants were representative of different age-groups, and were selected for their knowledge of the neighbourhood. Furthermore, the sample was balanced for the gender variable, considered as an intervening variable (Lawton 1994).

Subjects were also asked to indicate a 7-step scale the level of perceived knowledge of the neighbourhood.

Participant choices were analysed and compared with the parameters indicated by Steadman (2004): the distance and the number of turning points.

In this first step of the investigation, analysis showed that each approach cannot explain individuals choices.

In the light of these first results, the relevance of the "important empirical question" proposed by Steadman seems to be confirmed, as well as the necessity to study this topic taking into account the theoretical lens of both *transport models* and *space syntax*.

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