

# An Evolutionary Approach to Spatial Knowledge

## Theoretical Developments

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### **Abstract**

The purpose of this paper is to present Developmental Syntax (DS), its wider theoretical background and application to the field of spatial knowledge research.

DS is a contribution to the theory of spatial knowledge, produced as part of a recently completed (1999) PhD thesis and currently at Salford University. DS uses the unit of the 'person in surroundings' as its unit of analysis. This unit is used to conjecture relationships between the person and surroundings. The resulting model provides one basis for the study of spatial knowledge, the link between the 'knower' and the 'known'. 'Spatial knowledge' is used as a term to denote the relationship between thought and things contributing to any understanding of behaviour and behavioural settings at the social, urban and global scale.

DS links methods used in space syntax to a research field of 'emergence'. The techniques link large scale mathematical modelling with adaptive learning systems and can be reduced to three significant categories:-

Firstly mathematical systems and statistical analysis

Second, lawful algorithms linking random members of a social group to place in context, known as transactional relationships with phenomena such as scripted behaviours and behavioural settings

Third, the incremental associations, selections and conjectures of adaptive learning mechanisms and phenomena brought about by ecological perception, which is the focus of DS.

Space syntax significantly represents a holistic approach linked to lawful social and spatial functions, listed above as the first and second categories in emergence. The third category must, in any detailed analysis, be linked to the other two. Individuals acting in their surroundings have degrees of choice or selection and these influence their physical circumstances even though those degrees of selection are constrained in various ways.

Ongoing research at the Centre for Virtual Environments at Salford University is using emergence as a philosophy in Urban Modelling. This philosophy seeks to link large-scale environmental phenomena and social and spatial knowledge systems to selective individual choices. Advances in understanding the links between all three categories should prove useful to urban modelling and the increasing democratisation of the urban realm linking individual and local group interactions to the wider horizons of urban and global planning.