Cognitive Mapping Theory and the Cognitive Sciences

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"Cognitive psychology must take the environment more seriosly. Environmental psychology must take the mind more seriously...much of human impact on the environment is influenced by the processes of design and planning."

Kaplan & Kaplan (1989, pp. 1; 119).

Basically, the cognitive mapping theory has been studied by neuroscientists and environmental specialists. The first group has performed laboratorial tests with non-humans in specific spatial situations (as "mazes"), as well as research with humans patients with hippocampal lesions. We know the process in which hippocampus'"place cells" are responsible to acquires, codes, recalls and decodes information about the spatial environment (O'Keefe & Nadel, 1978). These cientists are responsible, recently, for creating artificial (computational) models of cognitive mapping (spatial recognition and place learning): the neural networks (Burgess, Recce & O'Keefe in: Arbib, 1995: pp.468-472; Waxman, Seibert & Bachelder in: Arbib, 1995: pp.1021-1024). The other group, environmental specialists (psychologists, designers and geographers), has been studying the processes of environmental perception and cognition (mental representation of environmental elements) and their relations to the human behavior (Kaplan *et tal.*, 1995; Gärling & Evans, 1991). This group also has been doing research concerning imageability of the built environment, wayfinding process and applied studies on cognitive maps (the influence of some important environmental characteristics which represent something "special" on mental image of the subject, as the seminal studies about *landmarks* and other elements on the imageability of the cities (Lynch, 1960). What we perceive is a gap: there is a relativelly little amount of specific studies concerning cognitive mapping theory on the cognitive science discipline *strictu-sensu*.

If we are trying to discover the brain mechanisms (and, more over, creating artificial models and neural networks), and if we do supose that there is some process occuring on the mind, between these mechanisms and the human behavior concerning the physical environment, we can not neglect the evironmental cognition studies: the cognitive mapping theoretical aspects and research.

Nowadays, the most important researches have been done in a multidisciplinary way, with specialists in different fields working together. In the field of cognitive mapping, we supose there should be three basic areas of studies: the neurosciences, the environmental-design researches and the cognitive psychology. Any researcher in these areas should be able to understand some basic concepts as hippocampal functions; vision pathways of "where system" & "what system"; spatial-memory system processed in hippocampus and adjacent areas; human behavior in spatial environment & some specific protocolar tests in environmental psychology; environmental cognition; spatial perception & gibsonian theories; mental images of built environment (studies in urban image), wayfinding process, egocentric & non-egocentric spaces; the mental imagery debate; artificial/computational models of representation of large-scale space, and so on.

So, we understand that there should be more studies about cognitive mapping made by cognitive scientists with their interdisciplinary approach. After all, we are studying the environmental cognition and the cognitive science is the multidiscipline that appears as the most recent and important field to understand all the processes of internal representations of the human behavior, including environmental representations.

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