Schematic Maps as Wayfinding Aids

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Abstract. Schematic maps are effective tools for representing information about the physical environment; they depict specific information in an abstract way. This study concentrates on spatial aspects of the physical environment such as branching points and connecting roads, which play a paramount role in the schematization of wayfinding maps. Representative classes of branching-points are identified and organized in a taxonomy. The use of prototypical branching points and connecting road types is empirically evaluated in the schematization of maps. The role played by the different functions according to which the map is classified is assessed, and main strategies applied during the schematization process are identified. Implications for navigational tasks are presented.

1 Introduction

Due to their abstracting power, schematic maps are ideal means for representing specific information about a physical environment. They play a helpful role in spatial problem solving tasks such as wayfinding. An important class of features for these tasks are route intersections (cf. Janzen et al., 2000, this volume). One of the challenges in constructing schematic maps consists in establishing clear relationships between detailed information found in the environment, and abstract / conceptual structures contained in the map. An important aim of any schematic wayfinding map is to efficiently support information to find a destination. Therefore, it is crucial to determine in which way and to what extent spatial information such as branching points and their connecting roads can be regarded essential or irrelevant, and therefore must be preserved or discarded during the schematization of a map.

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Aspects related to schematic maps as visual tools for communicating spatial concepts for wayfinding tasks must also be taken into account. Accordingly, the focus of this contribution is directed towards exploring spatial characteristics of branching points and their connecting roads in the schematization of wayfinding maps. The idea is to analyze how these features are affected during the process of schematization. After a brief review of selected literature in architecture, cognitive psychology, geography, and environmental design, we present a description of an empirical investigation, interpret results, and offer conclusions for the schematization of maps as wayfinding aids.

1.1 Spatial Orientation
A person’s ability to establish his or her location in an environment is termed spatial orientation (e.g., Arthur & Passini, 1992; Correa de Jesus, 1994). From a cognitive point of view spatial orientation is considered as the capability to form a cognitive map (Tolman, 1948; Golledge et al., 1996; Downs & Stea, 1973). Successful spatial orientation involves the representation of a suitable cognitive map of the environment, within which the subject is able to establish his or her position. The concept of spatial orientation has been demonstrated to be helpful in exploring some of the spatial characteristics that facilitate cognitive mapping. Lynch (1960) was one of the pioneers who established direct relationships between the spatial orientation of people and their physical environments. Since then, extensive research has been done in this domain. As the concepts of spatial orientation and cognitive mapping mainly refer to the static relationship between a subject and a specific spatial layout, they often neglect the dynamic effect of moving through a spatial environment (Passini, 1984). In the light of this situation, a new perspective was needed to define spatial orientation whilst moving in space.

1.2 Wayfinding as Spatial Problem Solving
In the recent years, the notion of spatial orientation has been replaced by the concept of wayfinding, which refers to the process of moving through space and encompasses the goal of reaching a spatial destination (e.g. Garling et al., 1986; Downs & Stea, 1973; Kaplan, 1976; Passini, 1998). Since finding a way is concerned with perceiving, understanding, and manipulating space, this concept is understood as a process of spatial problem solving. Wayfinding involves cognitive and behavioral abilities which are performed to reach a destination (Arthur & Passini, 1992; Lawton et al., 1996). These abilities, which play a critical role in achieving a wayfinding goal (e.g. reaching a desired destination), can be classified into: i) decision making, ii) decision executing, and iii) information processing (Passini, 1984; 1998).

The availability of relevant information about the environment is an important factor in the process of decision making. In wayfinding tasks, successful decisions are generally based on suitable information about physical characteristics of the environment. These account for a description of a net of connecting roads to be