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Editors' Introduction

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Spatial cognition can be considered as a set of foundational and central cognitive abilities that enable a variety of conceptual processes, both non-verbal and verbal. Further, according to recent research, spatial thinking seems to be critical in the development of abstract knowledge and in the processes of abstraction. Although there is a consensus regarding the role and impact of spatial cognition, there are a number of different, divergent, and sometimes even discrepant theoretical and methodological perspectives in the study of spatial cognition.

For instance, research on space differs according to the scale that is used. Large-scale spatial cognition research explores the ways we navigate over the long-term, and how we generate cognitive maps integrating both geometric, topological ('spatial' in the narrower sense) and non-spatial (e.g., emotional, social) information. On the other hand, small-scale spatial cognition research focuses on the visual field and on how space is represented and experienced within the scope of the visual field. Large and small-scale spaces have different and sometimes overlapping research methodologies. Even if we assume that spatial representation is scale-dependent, it is not entirely clear how much geometric and topological knowledge spatial representations actually provide or how they develop. According to many current results, geometric and topological structures are complemented by a variety of functional and non-spatial effects (e.g., emotions). Previous research has mainly focused on the impact of visual perception, and neglected the fact that spatial cognition is shaped by other modalities as well. An analysis of the way in which the processes of multimodal perception shape spatial cognition is among the most fascinating future research topics.

Another difference among researchers in the field of spatial cognition is that some carry out their research experimentally by means of empirical studies (broadly considered, studies in the psychological sciences), while others focus their research on formal semantic or mathematical modeling of spatial concepts, cognition, or discourse. For the latter, work on qualitative reasoning, formal representation of spatial language, or of spatial relations in general are crucial.

Another related discrepancy in current research on spatial cognition is over whether to focus on the cognitive representation of space or on its formal encoding in language. Though these perspectives have different research motivations, a dialogue between them is important. The semantics and syntax of locative expressions (both locational and directional) are linguistically important areas that can and should be complemented with experimental evidence. However, the question of how immediately the linguistic representation of space is based on its cognitive and perceptual representation is still important. The mappings from neural to cognitive domains and from cognitive (geometric and functional) domains onto linguistic representation are other areas where clear explanations are still lacking.

Finally, there are, on the one hand, approaches and frameworks emphasizing systematic cross-cultural differences in spatial cognition among different cultural groups and, on the other hand, there are attempts to define at least some core principles of spatial cognition that are shared by or invariant across different cultural communities.

These are just a few basic research dimensions that are central components of the current state of the art in spatial cognition research. Although these perspectives are each relevant to the others, they are not frequently discussed together. Thus, the aim of this symposium was to involve all these approaches in a constructive discussion. We did not want to highlight a particular approach in this context, but rather to show the plurality of methods, approaches, and perspectives in hopes of highlighting the ways in which they can be mutually informative.

The current volume consists of papers covering empirical (New-

combe, Ross et al., Šeškauskienė et al.), formal (Kracht, Rett), and philosophical (Gärdenfors) approaches, as well as applications to natural language processing of spatial information (Leontyev et al.) and experimental and computational work (Klippel et al., Wang et al.).

The symposium entitled 'Perspectives on spatial cognition' took place at the University of Latvia in Riga on September 12-13, 2014, involving interdisciplinary contributions from cognitive science, psychology, vision science, linguistics, anthropology, geography, computer science, and philosophy. 13 contributed talks were presented on topics ranging from philosophical, logical, and semantic themes to empirical, cross-linguistic, anthropological issues as well as some glimpses of applications in the computer sciences and technologies of spatial reasoning. The symposium was introduced by a keynote address by Dedre Gentner (Northwestern) and later continued by some of the most prominent scholars in the field – Peter Gärdenfors (Lund), Karel Jezek (Charles University, Prague/NTNU, Trondheim), Marcus Kracht (Bielefeld), Barbara Landau (Johns Hopkins), Tim McNamara (Vanderbilt), Nora Newcombe (Temple), Jessica Rett (UCLA), and David Uttal (Northwestern).