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Spatial Thinking, Cognitive Mapping, and Spatial Awareness

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Abstract

Spatial ability has attracted scientific and pedagogical interest particularly recently because it plays important roles in academic learning and everyday activities. Because of the importance, thinking about space has now been extensively discussed in a broader context of *spatial thinking*. A type of spatial thinking that is of particular significance to people's daily lives is cognitive mapping, a series of psychological processes of acquiring, representing, and using knowledge about spatial environments. The skill of cognitive mapping shows large individual differences, however, and the task of spatial orientation and navigation poses great difficulty for some people (especially people with a poor sense of direction). With the existence of such large individual differences, researchers' attention has shifted from asking whether people's cognitive maps are maplike to investigating how and why people differ so much in the fundamental ability of cognitive mapping. In this talk, I will look at why spatial is special for human cognition and behavior, and overview the characteristics of cognitive-behavioral approaches to the study of spatial cognition. I particularly discuss the motivation and findings in the research on cognitive mapping from the perspective of individual differences, and consider the possibility of improving cognitive mapping by training. I also discuss long-term cognitive consequences of the use of satellite navigation on people's spatial awareness and possible ways to adjust social design to the wide variations in spatial aptitudes and preferences among people.

Biographical Sketch

Toru Ishikawa is a Professor in the Department of Information Networking for Innovation and Design at Toyo University, Tokyo, Japan. He has a Ph.D. in geography from the University of California, Santa Barbara, and is an associate member of the Science Council of Japan. He specializes in cognitive-behavioral geography, geographic information science, and urban residential environments and planning. His research interests include cognitive maps and mapping, wayfinding and navigation, spatial thinking in geoscience, and geospatial awareness and technology. He is an editorial board member of the *Journal of Environmental Psychology*, *Spatial Cognition and Computation*, *Cognitive Research: Principles and Implications*, and the *Journal of Architectural and Planning Research*, and the author of the book *Human Spatial Cognition and Experience: Mind in the World, World in the Mind* (Routledge, 2020).