



Department of Geography, GIScience GIVA Brown Bag Series Spring Semester 2024



**Seeing more than we think we see.
Missing more than we want to miss.**

Prof. Dr Jeremy M Wolfe

Professor of Ophthalmology and Radiology
Harvard Medical School, Boston, USA

Date: Thursday 7 March 2024

Time: 13:00 – 14:00

Room: Y25 H-92



**Minimizing the Influence of Cognitive Ability
Facets in Map-Based Route Learning via
Instructional Interventions**

Prof. Dr Stefan Münzer & Hatice Dedetas Satir

Professor for Educational Psychology
*Chair of Educational Psychology
Faculty of Social Sciences
University of Mannheim, Germany*

Date: Tuesday 12 March 2024

Time: 12:15 - 13:15

Room: Y25 H-79



Designing context-aware mobile maps

Dr Mona Bartling

*Department of Geography, University of Zurich,
Switzerland
RMIT University, Melbourne, Australia*

Date: Wednesday 13 March 2024

Time: 12:00 - 13:00

Room: Y25 H-79





THU 7 March at 13:00 | Room Y25 H-92

Prof. Dr Jeremy M Wolfe

**Seeing more than we think we see.
Missing more than we want to miss.**

Abstract: Your powers of vision and visual cognition are quite amazing. You can, for example, look at a scene for 1/20th of a second and know that it is navigable. At the same time, you can look at your resumé for hours and still fail to notice a significant typo (Did you notice the doubled word in the previous sentence?).

How can both of these things be true at the same time?

I will illustrate some of your capabilities and some of your limitations and I will attempt to reconcile these competing facts.





TUE 12 March at 12:15 | Room Y25 H-79

Prof. Dr Stefan Münzer & Hatice Dedetas Satir

Minimizing the Influence of Cognitive Ability Facets in Map-Based Route Learning via Instructional Interventions

Abstract: Our paradigm on route learning involves the learning of a pre-planned route depicted on a map, and navigating that route subsequently in a virtual environment from memory. In this paradigm, the number of errors during the navigation task indicates the route learning performance. Map-based route learning requires active cognitive processing of the visualizations, which is presumably affected by individual differences in cognitive (spatial) abilities. Our research question was whether map reading instructions can diminish the role of such cognitive abilities. In the present study, we investigated working memory capacity (WM) and spatial perspective-taking ability (PTA) as cognitive ability facets. The study deployed a pretest-posttest instruction vs. control design ($N = 106$). Half of the participants received specific map reading instructions between the pretest and posttest (instruction condition). The instructions emphasized reading the legend and recognizing landmarks, using landmarks as memorable cues to remember actions, considering the navigation perspective during map reading, verbalizing the route information, and recognizing the initial orientation and direction of the route. The other half of the participants did not receive instructions (control condition). Results indicated that WM ($R^2 = .04$, $p = .045$) and PTA ($R^2 = .128$, $p < .001$) were significant predictors of route learning (navigation performance) in the pretest. Instructions did not directly enhance average navigation performance in the instruction condition compared with the control condition (posttest controlling for pretest). However, the impact of the cognitive abilities was strongly reduced in the instruction condition in the posttest but remained consistent in the control condition in the posttest. We interpret this pattern of results as an aptitude-treatment interaction (ability-as-compensator). In conclusion, cognitive instructions can mitigate the effects of individual differences in crucial spatial abilities in specific tasks, offering insights for educational and training interventions in navigational skills. In additional exploratory analyses, we examine reading processes (and changes due to instruction) using eye tracking during the map reading phase. Future studies will address improvement of instruction and training for competent reading of digital maps.





WED 13 March at 12:00 | Room Y25 H-79

Dr Mona Bartling

Designing context-aware mobile maps

Abstract: Mobile maps are an integral part of our daily routines, serving a variety of purposes in different environments. Since the activities and environments in which we use maps are diverse, adjusting the map design to suit the specific map use situation (i.e., map use context) is essential for providing appropriate maps. The evaluation of map use context is therefore crucial for a user-centered design of maps and for determining how aspects of map designs should adapt or vary between different map use contexts. For example, when using a mobile map while driving a car, the design should prioritize relevant wayfinding information and minimize distractions. However, in the same scenario, if the person has a color-vision impairment, the map design should present the information in an appropriate format, such as by increasing contrast or selecting color schemes and symbologies appropriate for the impairment.

In this talk, I will provide an overview of my research on context-aware mobile maps. I will explore methods for modeling and evaluating context and discuss empirical research for understanding how users' map interactions are influenced by different contexts.

