

Investigating Differences in Perception & Cognition of Map Symbols Through Laboratory & Online User Experiments

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Abstract:

User experiments in cartography are valuable for the insight they provide into how people perceive, understand, and use maps. However, the extended effects of the COVID-19 pandemic have complicated efforts to conduct these experiments under traditional arrangements. Specifically, most of the experiments have had to transition to online, remote delivery methods, often midway through a study and with little warning. This study aimed to use participant data to investigate the differences between how Australian and Chinese audiences read maps. Specifically, it explored dependence in cognitive styles, and how map readers from each culture perceived point symbols on tourist maps.

Participants from China and Australia completed a compound figures test and a visual search task on cartographic stimuli. While the Chinese data was previously collected under laboratory conditions, on-site at Nanjing Normal University, the Australian data was collected later, mid-pandemic. This forced the experiment to be altered to online delivery, using Prolific for participant recruitment (Peer *et al.* 2017), Qualtrics for participant screening and questionnaire delivery (Qualtrics 2021), and Hypothesis for the cognitive and map-reading tasks (Šašinka, Morong & Stachoň 2017). Notably, the lack of control of extraneous variables such as screen size, display resolution, device type and lighting environment meant the experiment had to be adapted. Furthermore, additional efforts were made to ensure the delivery of the experiment was self-explanatory, noting the absence of researchers in real time to guide participants in completing the study. The results between the two groups were then compared for effects.

The different collection methods had probably little effect on the reliability of the participant data. Both groups had similar distributions of results about their respective means and had a similar number of outliers. Notably, the most significant difference between the two groups was the demographic diversity of the participants. Most of the Chinese data was collected from students in one faculty of Nanjing Normal University, which resulted in a very specific demographic section of the community being studied. However, the Australian data was more diverse, with participants from across the country with different personal and educational backgrounds. This difference highlights the importance of user-research considering the need to balance sample compatibility and sample representativeness (Taras, Rowney & Steel 2009). Furthermore, this research may provide future studies with some guidance on delivering cartographic user experiments through an online medium.

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