

What Do Experts Trust in Maps?

Evlatia Karagianni *, Andriani Skopeliti

Cartography Laboratory, School of Rural, Surveying and Geoinformatics Engineering, National Technical University of Athens, Greece, linakar@mail.ntua.gr, askop@survey.ntua.gr

* Corresponding author

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Abstract:

The ease of access to mapping tools has enabled more people to create their own maps without necessarily being familiar with basic cartographic principles or the ethical obligations that maps have towards users and society. At the same time, Cartography has adopted a variety of Artificial Intelligence (AI) technologies to automate traditional processes. This has further democratized the map-making process, but it has also brought novel challenges. Consequently, non-experts and untrained cartographers are allowed to widely generate map products, which may be inaccurate or biased, risking the spread of fake news and misinformation. Ethical concerns have been rising as readers generally trust maps easily and the way they view the world can be influenced by these misleading depictions. Recently, a growing number of cartographers have been addressing these issues and are focusing on understanding what makes a map trustworthy. However, the practical cartographic factors that determine the degree of trust in a map have been understudied and remain unclear.

This study aims to contribute to empirical map trust research and, particularly, to investigate how specific cartographic elements influence the trustworthiness of maps. The implementation involves conducting a user study via a questionnaire, using viral social media maps as stimuli, and targets experts in fields such as cartography, geographic information science, and geodata visualization as participants. The objective of the research is to check the influence of a series of map elements, as derived from existing cartographic literature on trust with experts in real life conditions e.g. maps in social media.

The cataloguing of cartographic elements that affect trustworthiness, as well as their empirical evaluation, has been practiced sporadically. Hips and Nelson (2025) adapted a framework for understanding visualization trust (Elhamdadi et al., 2023), and formed it specifically for maps, in order to identify and list the most likely antecedents of trust creation. The way a cartographer synthesizes these factors shapes his design choices, which must be made to avoid misleading the users (Monmonier, 1991), and it is theorized to directly affect trust in a map. How these elements influence trust in maps depends, consequently, on the users themselves and any framework's component must be tested with them to be confirmed. This study will include experts' qualitative and quantitative evaluation of the listed map elements and their expertise will help to refine trust frameworks.

The questionnaire is distributed online to collect responses from map experts, who are asked to evaluate a variety of maps and identify the cartographic factors that influence their trustworthiness. A number of maps are used to empirically test map elements based on the existing framework. These map stimuli are sourced from viral social media posts on Facebook, LinkedIn, Instagram, or X, in order to include maps that general public engage with through their online interactions (see Figure 1). This approach aims to bring to the forefront users' spontaneous map preferences and to ground the study in real-world cartographic content that is currently circulating, informing, and shaping public opinion. The questionnaire contains the following:

- A **quantitative** evaluation of the trustworthiness of a map using a Likert-type scale
- A **qualitative** evaluation of the trustworthiness of a map using open-ended questions.
- A **numerical ranking** of the specific elements on a map
- An **assessment** of the user's intention to **share** the map online

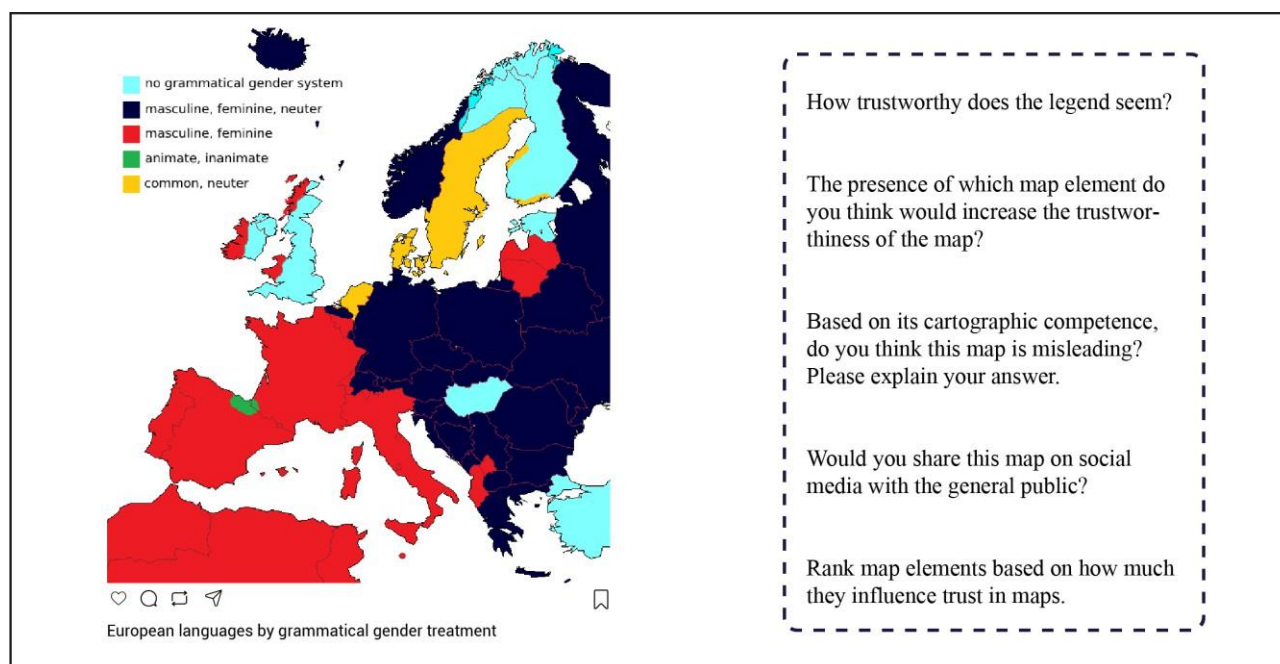


Figure 1. Example of map stimuli and related questions (source: Instagram post by @Ifuckinglovemaps, 2021).

The results will be presented and contribute to ongoing discussions on map trust, with the aim of bridging the gap between theoretical frameworks and empirical findings. Expert insights will provide scientific validation of the elements that most significantly influence map trustworthiness. These findings can serve as a baseline for strategically planning future large-scale studies to capture how non-expert audiences, who interact daily with maps, perceive and trust cartographic information.

References

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