

Materiality in Cartography, A First Attempt to Evaluate its Usefulness

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Materiality has not played a major role when it comes to cartography studies. Maps are often perceived as visuals and not as objects. Some cartography scholars have talked about maps as physical objects and the role of materiality on the messages that maps aim to convey. However, little attempts have been made to evaluate the effect of the materiality of maps.

Observing the role materiality has reached in other fields that overlap with cartography, it is relevant to ask ourselves about the potential of considering materiality as a cartographic variable.

BACKGROUND

Materiality is commonly understood as the physical properties of an object and how they influence human behavior and perception. Materiality has gradually become a dimension of study in various fields. Social sciences have found in material culture a tool to study social relations. Cognitive sciences, on the other hand, recognize material elements as agents in the cognitive process, under the concept of the embodied mind. Visual arts and design find in the use of materials a tool to shape human behavior, evoke emotions, and communicate messages.

These fields are deeply intertwined with cartography, sharing an interest in processes such as human cognition and communication techniques. Although the use of materials in cartography has been defined through a practical lens, there is a growing interest in exploring other sensory dimensions through the materiality of maps.



Fig. 1. Amazonia: Key priority areas, (Quintanilla, Guzmán León, & Josse, 2022)



Fig. 2. Unconventional media map of the degradation in the Amazonia. Materials: Cow bones and coins.

METHODOLOGY

The aim of this study was to explore the effects of materiality through the cartographic process. The degradation of the Amazonia was selected as a case study to be mapped. A conventional media map of the topic, digital later printed on paper Fig. 1, was selected to be the base for the creation of an unconventional media map that would explore materials for its composition Fig. 2. Based on this, a material exploration process was conducted and two main materials, bones and coins, were selected based on the symbolic relation to the topic and the physical characteristics convenient from a cartographic design perspective. Bones representing the cattle ranching as the main deforestation cause (Nepstad et al., 2008), and coins representing the materialistic view of the amazon as a source to be exploited for economic interest (Pereira & Gebara, 2023).

A comparative user study was conducted with 23 participants who interacted with the conventional media map printed on paper and the alternative media map. Quantitative and qualitative data was collected to study the differences in the interaction and perspective of the participants towards both maps. Statistical analysis using the Wilcoxon signed-rank test for paired data was conducted, complemented by qualitative coding and word cloud analysis.

CONCLUSION

The incorporation of alternative materials significantly influenced various aspects of the cartographic process. This impact extended from the mapmaker's experience during conceptualization and creation to the users' interactions and perceptions of the maps.

The observation of the map-user encounters and the questionnaire answered by the participants gathered information regarding the interaction with the maps and the perception of them.

The paper map was highlighted by its accurate depiction of the data and was described as more scientific and familiar. Users reported higher levels of trust in this map, potentially influenced by a positivist approach to map interpretation.

In contrast, the material map was perceived as more artistic and unique. The use of the materials aroused curiosity among the participants, higher interest was shown towards the material map. The use of materials also resulted in a multisensory experience, with nine participants physically touching the map, and most expressing an interest in interacting with it beyond mere observation. Some participants also recognized the symbolic significance of the materials, highlighting the potential of materiality as a variable with the potential of shaping communication in cartography.

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Materiality, affordance, sensory interaction,
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