
Materiality in Cartography, A First Attempt to Evaluate its Usefulness

Manuela Londoño Jiménez^{a*}

^a *University of Vienna - manuela.londono.jimenez@univie.ac.at,*

* Corresponding author

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Abstract:

Materiality has gradually become a dimension of study in various fields. In the realm of social sciences, the study of materiality emerged from a change in its paradigm, that resulted in studying the role of objects as shapers human behaviour, culture and social interaction (Miller et al., 2005). In media studies the media and its physical properties was recognized as an element shaping social connotations and the way civilizations developed (Innis, 1951). From the perspective of cognitive science, Material Engagement Theory (Malafouris, 2013) emphasized how the material world plays an active role in cognitive processes, and how the discussion shifts from how we think about things, to how we think through things. This way the human mind passes to be recognized as embodied and not limited to the brain. Furthermore, in art, materiality is recognized as a dynamic agent that contributes to the meaning of artworks through the affordances in sensory experience and through the symbolism of materials (Murdoch Mills, 2009). Lastly, in design, the materials used in a product are understood as agents that can shape the user's behaviour, emotional response, and perception of an object (Karana, 2009), thus materiality is recognized as a key variable in design.

While cartography has traditionally focused on practicality, recent artistic experimentation with maps suggests the potential for expanding the use of materials in cartography and the interest in adopting materiality as a variable in the cartographic process. Few attempts have been made to study the role of materiality in cartography, specifically its effect on the perception of map users. Although scholars have discussed the relevance of the materiality of maps (Bunge, 1971; Edney 2019), it remains to be analysed how the use of different materials in map making might affect the interaction between users and maps.

After conducting a literature examination of materiality in different fields, I had the aim to explore the possibilities and effects of a conscious selection and use of materials throughout the mapping process in different stages, from the conception, design and creation of a map to the subsequent user-map interaction. I selected a case study which was the environmental degradation of the Amazonia and a conventional media map that would depict this thematic. I used the conventional media map as a base for the creation of a map that explored its materiality as a design variable. For this stage, I considered alternatives of materials due to the material significance in relation to the mapped topic. Moreover, I analysed the physical properties of the materials, its affordances and its cartographic possibilities in map creation. This step led me to the selection of two materials, cow bones and one cent of Euro coins, that became be the main components of the map. Subsequently, for the design process of the map and its crafting I followed a process that combined cartographic design and artistic exploration.

For the last stage of the project, I conducted a user study with 23 participants. The comparative study presented both paper and material maps to the users. The encounters were individual and unrestricted in terms of how participants could interact with the maps. These interactions were observed and noted. Subsequently, the users completed a questionnaire with ranked and open-ended questions regarding their perception of the objects as maps, their impulse for critical reflection, their sensory interaction impulse, their trust in the maps, their perception of the amount of information presented, and their emotional response, all in relation to each of the maps. The collected data was analysed through quantitative and qualitative methods. A statistical analysis concluded that there was a statistically significant difference in 3 of the 6 comparison items. Additionally, qualitative insights provided a broader understanding of the motivations behind the similarities and differences perceived by the users. The study provides a beginning point for exploring the possibilities of materials in cartography, in the mapper's experience, in the enhancement of messages in map communication, and in the experience and cognitive process of map-user interaction.



Figure 1. Material Map, Materials: Cow bones and coins in a wood base.



Figure 2. Survey: How much do these maps involve you in a critical reflection about the topic presented? Open answer

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