

Map Design: What If Less Isn't More?

Sacha Schlumpf^{a,*}, Georg Gartner^a

^a Technische Universität Wien, Research Unit Cartography – sacha.schlumpf@tuwien.ac.at, georg.gartner@tuwien.ac.at

* Corresponding author

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Abstract:

On social media, pretty and unique map designs tend to receive a lot of attention. Newspapers also develop their own visual systems for charts and maps. However, as Tufte first theorized and a whole branch of map design followed, a good data visualization is minimalist, with only the data mattering and everything else considered "chartjunk." If this is true, why do cartographers learn new design techniques, such as texturing and realistic 3D rendering of shaded reliefs? Is this extra effort just wasted time?

In the field of data visualization, this has been a long debate. On one side are the pro-minimalism, who defend that chart designers should remove any unnecessary elements to focus on the data only. This has been theorized in particular by Tufte (1983), whose opinion and experience suggests to always favor the highest data-to-ink ratio possible, meaning that most of the space is dedicated to the data itself. According to the minimalist perspective, this helps the readers to understand and process the data they are being shown, and is hence the right approach. They call non-data elements "chartjunk".

On the other side, the pro-embellishments disagree with Tufte. Even more, some research proves that the minimalist approach has some drawbacks in comparison to adding non-data-ink, or visual embellishments, on charts. The pro-embellishment approach suggests that elements that do not belong to the data, such as decorating elements, can provide several benefits. In particular, Bateman et al., (2010) conducted a user study to compare the impact of minimalist chart design against the same charts with embellishments. Not only did they find out that the embellished charts were well understood and as fast as the minimalist ones, but they also showed benefits: The participants indicated that they preferred the embellished ones, and after several weeks, they remembered them better.

However, creating such visualizations requires other sets of expertise: "creating appropriate and attractive visual embellishments is a non-trivial task, especially for amateur designers who have some design experiences but have not received professional training" (Chen et al., 2022, p. 1). Not every person able to create good minimalist charts would also be able to create good embellished ones.

From this debate came these questions: What about maps? Should thematic map design be minimalist or embellished? Do thematic maps also benefit from embellishments? Like for charts, creating good embellished maps requires other sets of expertise. Is that extra effort worth it?

Muehlenhaus (2012) explored similar questions and showed that the graphic style of a map has an impact on the perception of the data and the message. Some graphic styles were preferred, and some were more likely to be remembered according to the participants. While this research does not focus on embellishments, it shows that the graphic style of a map has a great influence on readers' perception.

Our research methodology is directly inspired by that used by Bateman et al. (2022) for charts. The original methodology had some shortcomings, for example, the embellishments were tied to the message of the charts, and the minimalist designs were not realistic, as they were often black and white (Few, 2011). We therefore adapted this methodology for maps, taking the aforementioned critique into consideration.

A total of 20 maps were created, with 10 maps in each of two graphic styles. One style is minimalism, in which only elements directly related to the data are shown without embellishments. However, unlike Bateman et al.'s research, the minimalist maps will retain colors. The other style, the "embellished" maps, shows the same information, but in a different graphic style. Some elements are not directly related to the data – the embellishments.

The participants come in person to see the maps. We show them 10 maps: 5 are minimalist, 5 are embellished. The participants read each map and answer four questions:

1. What is the map's subject?
2. What are the displayed categories and values?
3. Is there a trend? If yes, which one?
4. Is the author trying to communicate some message through the map?

Participants are then invited to a second meeting. Half of the participants have the second meeting a few minutes after the first one (short-term recall). The other half has the second meeting two to three weeks later (long-term recall). In both cases, the participants are not informed that the second meeting will be about memory. We structure both short-term and long-term recall meetings identically. First, participants are asked to recall as many maps as possible. Then, we ask them to describe the maps based on four questions (subject, categories and values, trend, and message).

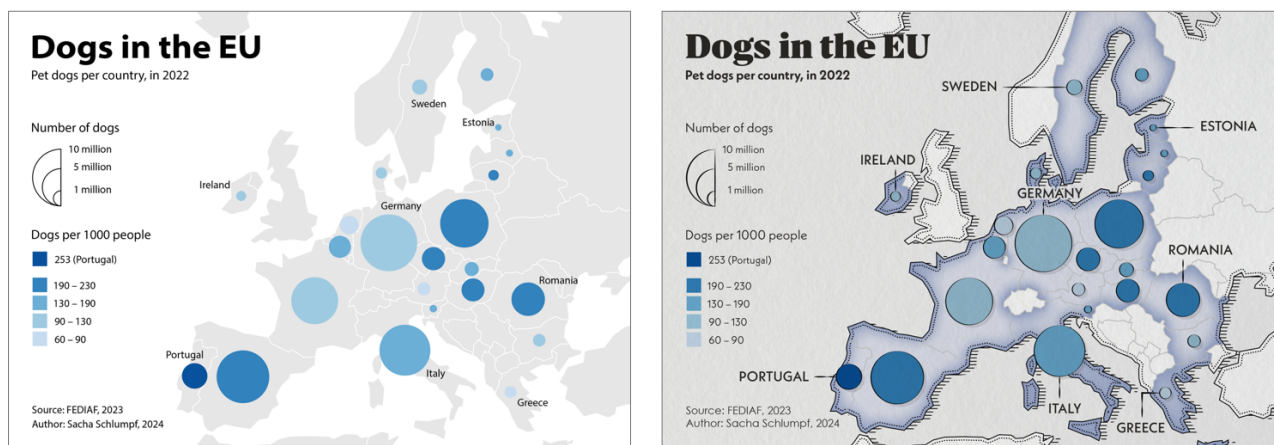


Figure 1. Example of a minimalist map (left) and an embellished one (right)

The results are expected to be similar to Bateman et al. (2010) research. This would suggest that, for maps as well, embellishments can also be beneficial for understanding and memorability in maps. Together with many other studies, this research shows the importance of graphic design expertise in map-making as one of many skillsets necessary for creating a good map.

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