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Can data visualisations mobilise people to act?

Monika Frątczak shares findings from her PhD research exploring emotional responses to datavis and engagement with climate-related issues

Encounters with data visualisation (datavis) are now a frequent occurrence in our daily lives – think of the many graphs, charts and maps about the coronavirus pandemic that appear online, on TV and in print. Yet there is little understanding of the role of these datavis and their social impact. Are they presented and consumed as mere illustrations, secondary in importance to the words that surround them? Or are they powerful tools for conveying a message, helping readers to engage with information both intellectually and emotionally, and prompting them to act?

Most studies to date in areas such as science communication have focused on the capacity of datavis to convey knowledge, its efficiency, or comprehension. This may be related to the belief that data, statistics, and therefore datavis do not have a large emotional impact on audiences, unlike other visuals such as photographs. Therefore, the purpose of datavis may be seen mainly as a tool to allow audiences to independently explore data and draw empirical conclusions.

But emotions *are* vital components of how people make sense of data, as several practitioners and researchers argue,¹⁻⁴ and emotions also motivate people to become actively engaged in social and political issues.⁵⁻⁶

As part of my PhD research, I am exploring audiences' emotional responses to datavis, and whether and how these responses play a role in enabling political participation in datafied democracies. I do this through a focus on climate change, investigating datavis produced or published by information providers and campaign groups such as Carbon Brief, Climate Science (Nauka o klimacie), Greenpeace and the World Wildlife Fund, all of which are from the United Kingdom and Poland.

For my research, I recruited and talked to people who shared or responded passionately to datavis published on social media and had some prior awareness of climate change issues.

This allowed me to better explore their emotional responses and pick out nuanced differences. Some of those I spoke with had some degree of skill in relation to datavis, while others had not encountered datavis before but may have been moved by a particular example.

Through semiotics analysis of 13 datavis about climate change, interviews with 10 datavis designers or communication experts, and interviews with 34 diverse audience participants from the UK and Poland, my study identified that datavis can trigger multiple, often contradictory, positive and negative emotions that in turn play an important role in involving audiences in climate change issues and empowering them to participate in data-driven democracies. (For example, interactive elements of datavis that allow for the exploration of data can spark feelings of excitement and playfulness, even though the subject matter is serious and concerning.) From these findings, I developed a typology of participatory responses and political activities influenced by datavis: from the informal and every day, to the more formal and occasional.

#1 Sharing datavis (micro/informal/every day)

Most audience participants who were emotionally affected by a datavis said that their first reaction was to share the datavis with others. They did so in a variety of online and offline contexts, with a wide variety of people.

The main purpose of sharing datavis was to raise awareness and educate or to start a conversation around an issue. For example, Anjelo, a 32-year-old meteorologist from the South Pacific island of Tonga, who had lived in the UK for two years during his studies, not only commented on the Ed Hawkins “Warming stripes” datavis (see Figure 1) on social media, he also asked Hawkins to design a version for Tonga. Anjelo also shared the original with colleagues at work and tried to reproduce it with them using their own data sets: “We have not gone out publicly with this ‘show your stripes’ data visualization format. But then yes that’s what led me on to discuss this with my staff and then my boss. And even our climate section, we shared this – this idea (...).”

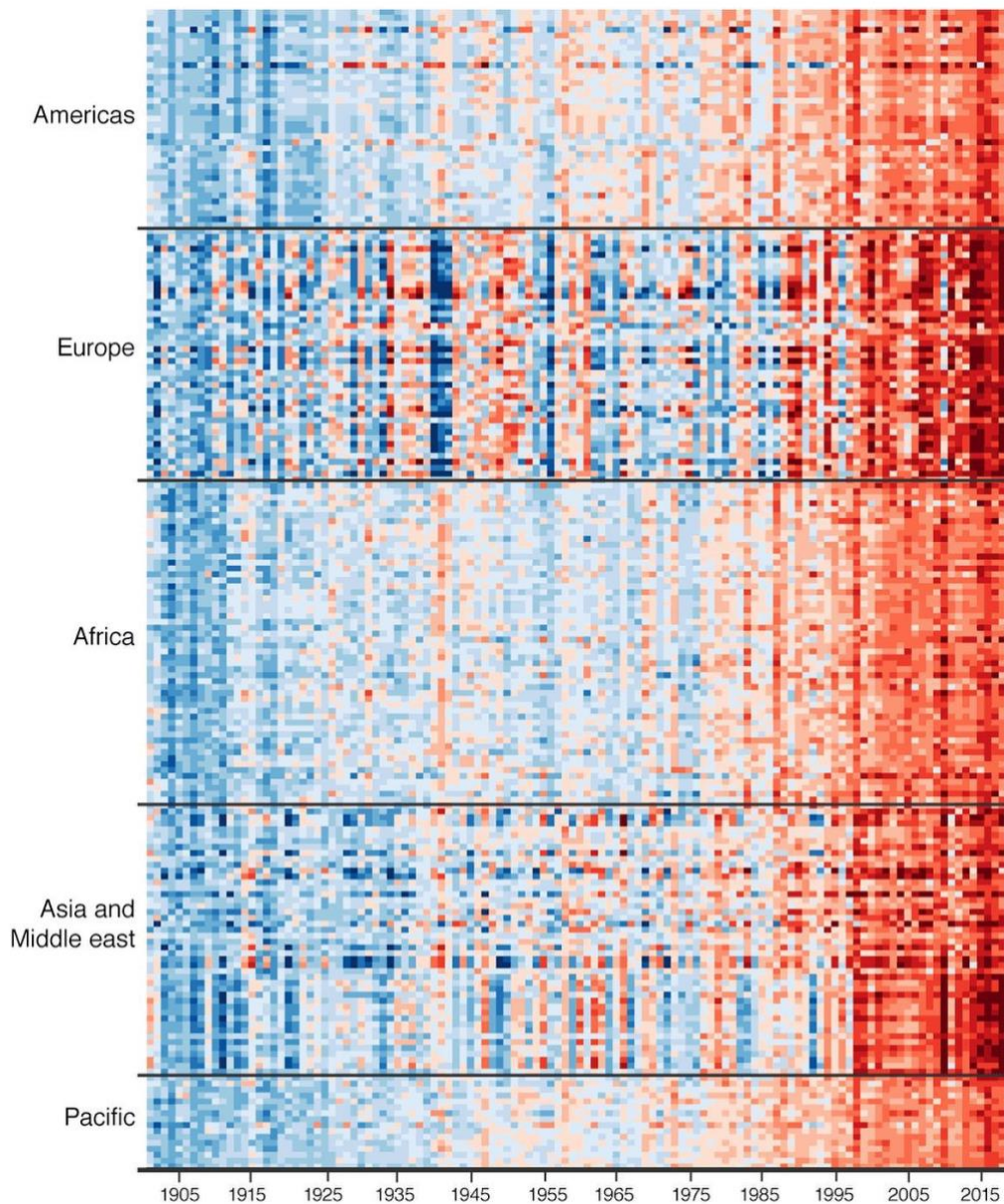


Figure 1: Visual representation of the change in temperature measured in different countries in different regions of the world over the past century. Source: showyourstripes.info, by Professor Ed Hawkins (University of Reading; published in 2019).

#2 Change in everyday practices (micro/informal/every day)

Most audience participants showed greater engagement with datavis that related directly to their daily lives, and which showed them things that they could change as individuals. Thus, in most cases, the participants reacted to these sorts of datavis by undertaking activities in

their immediate environment, such as eating less meat, buying environmentally friendly products, reducing food waste, and reducing car use. However, despite a few examples of behaviour change provoked directly by datavis, most participants stated that they had already been active before and that the datavis simply reinforced their efforts and encouraged long-term, persistent behavioural change.

For example, a graphic showing the area of burnt Australian forests in relation to the area of the UK (see Figure 2) re-enforced the determination of Bill, a 64-year-old taxi driver from the UK, to take action to tackle climate change: “I’m about to switch and buy an electric taxi and it’s kind of financially challenged me a little bit, but I’m even more determined to do it. (...) Yeah, it’s helping to make me do more. I’ve just agreed to have solar panels put on the house and a solar battery for charging up from the sunlight. It’s motivational.”

#3 Unconventional political participation (meso/semi-formal)

Unconventional and less traditional forms of political participation – such as signing a petition, joining a protest, or donating money to organisations – were more common among participants than conventional forms of political participation – such as contacting officials or joining a local community group. Donating to organisations was mentioned by a few people who found it the fastest and most effective way to help and get involved. However, the largest number of audience participants said that they signed a petition – people like Jo, for example, a 32-year-old graphic designer from the UK who responded to a datavis published by Carbon Brief about food production and greenhouse gas emissions (see Figure 3): “I have signed many petitions in the past after becoming aware of issues like this and also emailed my local MP about some of these issues.”

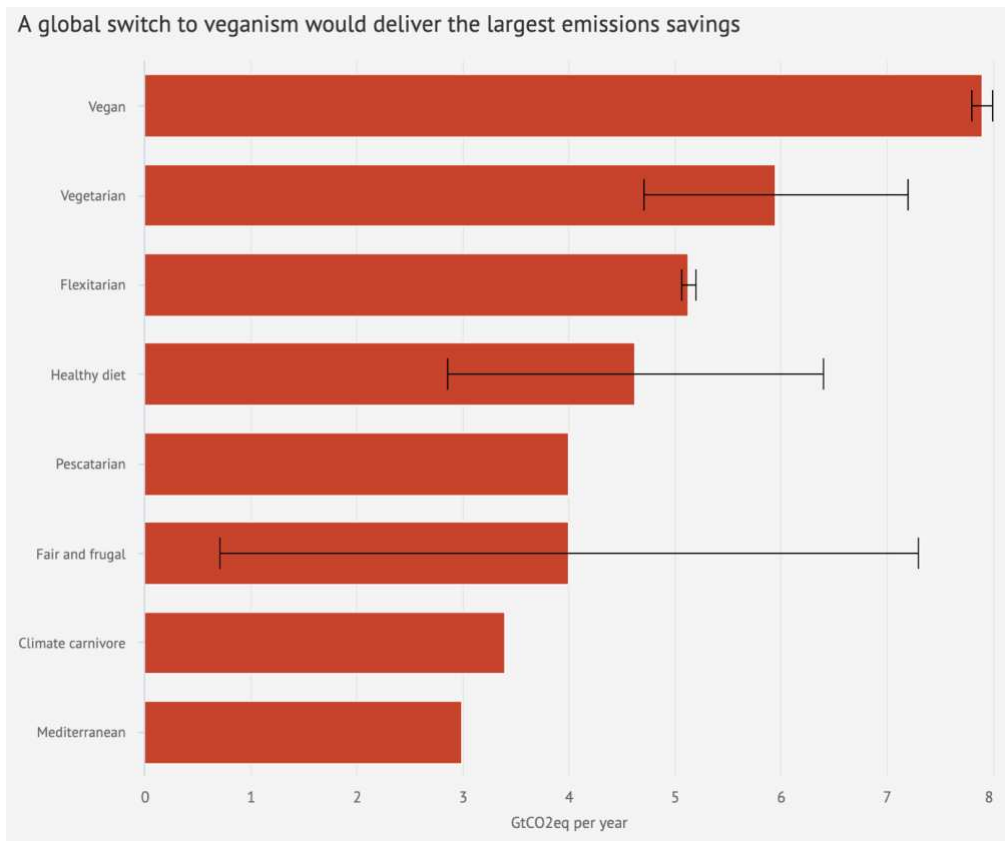


Figure 3: According to the Intergovernmental Panel on Climate Change, a global switch to veganism, vegetarianism, or flexitarianism could deliver savings of 5bn tonnes (or above) of CO₂ equivalent per year by 2050. Source: Carbon Brief UK ([bit.ly/351xAkV](https://www.carbonbrief.org/bit.ly/351xAkV); published in 2020)

#4 Conventional political participation (macro/formal level)

In the above statement, Jo recalls the message she sent to her local MP. This more conventional form of political participation was rarely mentioned in interviews as something people engaged in after experiencing a datavis. Only one other reference was made to this type of action: by Jadwiga, a 70-year-old pensioner from Poland, who contacted various bodies and organisations in response to a graphic showing her city among the 50 places with the most polluted air in the European Union (see Figure 4): “I even wrote to Greenpeace too. But Greenpeace told me that they couldn’t help. (...) I called ecology every day, the Department of Environment, and nothing. I was at my local office in the Environmental Protection Department, and they said they cannot help.”

Jadwiga had been concerned about air pollution long before she encountered this graphic online. However, as she explained, slightly nervously during the interview, it was the datavis that mobilised her to take decisive action.

Context matters

Overall, my study suggests that datavis can primarily sustain or reinforce pre-existing mobilisation and can lead to changes in daily practices as a form of civic participation.

Graphs, charts, and maps more often motivate people to act on an informal, individual, and everyday level, and less frequently on a more formal and public scale. Furthermore, less organised, unconventional forms of participation were more common among participants than more traditional and organised forms.

However, when considering and determining the place of datavis in participatory processes, the contextual aspects of these practices should not be overlooked. Datavis seems to be an effective tool for mobilising audiences to act, especially at an everyday level, but it does not exist in a vacuum. Only several participants remembered exactly what actions were taken in response to a particular datavis. Their mobilisation and participation were influenced by other factors such as, for example, information possessed before encountering the datavis. Yet many audience participants remembered that a particular datavis made a strong impression on them and mobilised them to act or continue their involvement.

It should be emphasised that not all datavis is equally effective. Where a datavis does not make it clear what actions an individual can take, most audience participants indicated that they were not mobilised to act further, even when a datavis shocked them, changed their minds, or caused them to care about a particular issue. On the other hand, datavis that had a greater impact on the behaviour and decisions of participants were those that indicated, directly or indirectly, what could be done and how people could contribute to bringing about change.

For all these reasons, participation enabled by datavis is not straightforward. It happens on many levels and depends on the person encountering the datavis and the context in which the encounter takes place. Datavis is one of a constellation of factors and cannot be seen as

the only factor influencing participation. Furthermore, the different categories of involvement triggered by various types of datavis are intertwined; they overlap and exist across public and private, formal and informal, and online and offline spaces. They are not fixed or static but relational.

Note

Research participants quoted in this article are pseudonymised and consented to their comments being used in publications.

Disclosure statement

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