BRIEFING NOTE

FEB 2016

Creating climate science visuals that are accessible *and* scientifically accurate

Recommendations:

1. Just as climate scientists use the best available evidence to make assessments about climate change, the best available evidence of how people process complex information (i.e. from the cognitive and psychological sciences) should be used to inform communication of the science.
2. There should be greater collaboration between the climate science and social science communities to help understand the cognitive challenges experienced by different audiences when interpreting climate science visuals.
3. Developing such partnerships would also enable the application of cognitive insights to improve the accessibility of visuals without compromising their scientific accuracy.

Examples of cognitive insights:

Approaches to achieve accessibility and accuracy

Visuals of the science of climate change can be made more accessible without losing scientific accuracy. Accurate understandings of complex information can be supported by:

- guiding visual attention[1]
- activating relevant frames of knowledge[2]
- structuring information.[3]

Use text appropriately to guide understanding

Different audiences have different information needs and different levels of prior knowledge. These factors can influence which information is attended to in a visual and how that information is interpreted. As a result, simplistic interpretations or misinterpretations of data can occur.

However, text read prior to a visual can direct visual attention, influence how the brain processes visual information[4] and support *appropriate* inference-making.[5] Text supporting a visual should therefore be in close proximity to the visual, suitably salient and easily understood.

Intuitions of 'effective' figures may be wrong

Some experts and non-experts prefer figures that contain more detail and information than needed, even if this makes comprehension more difficult.[6] Intuitive design practices may be the opposite to best practices.

Evaluation of communication materials should use objective measures of cognitive performance, rather than rely on intuitive judgements.

References:

1. Grant, E.R. & Spivey, M.J. (2003). *Psychological Science*, 14(5), 462-466.
2. Gick, M.L. & Holyoak, K.J. (1983). *Cognitive Psychology*, 15(1), 1-38.
3. Stofer, K. & Che, X. (2014). *Journal of Eye Movement Research*, 7(5):2, 1-15
4. Coventry, K.R., *et al.* (2013). *Psychological Science*, 24(8), 1379-1388.
5. Harold, J., *et al.* (2015). In Noelle, D. C et al. (Eds). *Proceedings of the 37th Annual Meeting of the Cognitive Science Society*, 872-877.
6. Hegarty, M., *et al.* (2012). *Journal of Experimental Psychology: Applied*, 18(1), 1–17.

Jordan Harold [1,2] Kenny R. Coventry [1] Irene Lorenzoni [2,3] Thomas F. Shipley [4]

1. School of Psychology, UEA, UK. 2. Tyndall Centre for Climate Change Research, UEA, UK.
3. School of Environmental Sciences, UEA, UK. 4. Department of Psychology, Temple University, USA.

For further information, contact:

Jordan Harold
School of Psychology, UEA
Jordan.Harold@uea.ac.uk
+44 7810 714 607

University of East Anglia

Tyndall Centre for Climate Change Research

TEMPLE UNIVERSITY