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Research paper

## Climate visuals: A mixed methods investigation of public perceptions of climate images in three countries

Daniel A. Chapman<sup>a</sup>, Adam Corner<sup>b,c</sup>, Robin Webster<sup>b</sup>, Ezra M. Markowitz<sup>d,\*</sup><sup>a</sup> Department of Psychological and Brain Sciences, University of Massachusetts, Amherst, USA<sup>b</sup> Climate Outreach, Oxford, UK<sup>c</sup> School of Psychology, Cardiff University, Cardiff, UK<sup>d</sup> Department of Environmental Conservation, University of Massachusetts Amherst, 160 Holdsworth Way, Amherst, MA 01003, USA

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## ABSTRACT

Imagery plays a central role in climate change communication. But whereas research on the verbal communication of climate change has proliferated, far fewer studies have focused on visual communication. Correspondingly, relatively little is known about how to effectively engage the public using the visual medium. The current research is the first mixed methods, cross-national investigation of public perceptions of climate images, with a focus on photographic climate change imagery. Four structured discussion groups in the UK and Germany ( $N=32$ ) and an international survey with an embedded experiment in the UK, Germany and the US ( $N=3014$ ) were conducted to examine how different types of climate change imagery were evaluated. The qualitative research pointed to the importance of the perceived authenticity and credibility of the human subjects in climate images, as well as widespread negativity towards images depicting protests and demonstrations. Images of climate 'solutions' produced positive emotional responses in the survey and were less polarizing for climate change skeptics, but they were also the least motivating of action. Familiar climate images (such as a polar bear on melting ice) were easily understood in the survey (and evaluated positively as a consequence) but viewed with cynicism in discussion groups. We present a detailed discussion of these and other key findings in this paper and describe a novel application of the data through an online image library for practitioners which accompanies the research ([www.climatevisuals.org](http://www.climatevisuals.org)).

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## 1. Background

Over the past decade there has been a proliferation of academic research and practitioner literature that has sought to address the question of how to more effectively communicate climate change (e.g., CRED & ecoAmerica, 2014; Van der Linden et al., 2015b). However, although much is now understood about public engagement with climate change, the vast majority of climate communication studies have focused on verbal communication. Climate change is a particularly difficult issue to communicate, let alone visualize. The widespread perception of climate change as an abstract, distant, and uncertain phenomenon presents it as a uniquely complex problem for motivating individual and group-level engagement (Gifford, 2011; Markowitz and Shariff, 2012). But despite the fact that thousands of climate change images are

shared by journalists, campaigners and educators around the world on a daily basis, little research has focused on how to more effectively communicate climate change in the visual medium.

The lack of past research on visual imagery and climate communication is both puzzling and problematic. A wide diversity of images are used to depict climate change—from pictures of smokestacks and traffic jams (highlighting *causes* of climate change) to iconic images of polar bears on isolated patches of ice (focusing attention on potential *impacts*) to photos of people installing photovoltaics on their roofs (showing possible *solutions* to the problem). Yet despite the crucial role of climate imagery in shaping how people conceptualize the issue of climate change (Leiserowitz, 2006), non-governmental organizations and climate change advocates often have only anecdotal evidence to back up their selection of particular visuals over others; moreover, practitioners' intuitions about "effective" visual communication messages sometimes conflict with what researchers have found through controlled studies.

\* Corresponding author.

E-mail address: [emarkowitz@eco.umass.edu](mailto:emarkowitz@eco.umass.edu) (E.M. Markowitz).

### 1.1. Research on climate change imagery

The term ‘visual communication’ is an extremely broad one, with research on visuals and imagery having roots in a number of academic disciplines and fields (e.g., Messaris, 1997; King, 2014; Zillmann, 2002). As a consequence, an exploration of “climate visuals” might feasibly involve an analysis of disparate visual media, from maps and three-dimensional visualizations, to cartoons, infographics, graphs and even videos (O’Neill and Smith, 2014). Given the ubiquity of photographic images depicting climate change and the potential power of this type of visual to enhance engagement with climate change, our focus in the current paper was on photographic imagery. This decision does not imply that alternative visual media such as maps, cartoons, or infographics are less relevant for academic study, but it is notable that there are also very few systematic analyses of the effectiveness of climate change videos, cartoons, or infographics, despite their widespread use and assumed-efficacy in terms of public engagement (see O’Neill and Smith, 2014; Sheppard, 2012).

A limited body of research primarily using qualitative methodologies (e.g., Q-sort, focus groups) or content analysis has investigated how people think about and respond to photographic climate change imagery. Of the work that does exist, most grapples with the dual challenge of persuading the viewer that climate change is a significant issue while presenting it as a solvable one. There is also a related nascent literature using content analysis and related methods to examine how climate change is framed and visualized in news media coverage (e.g., O’Neill, 2013; Rebich-Hespanha et al., 2015; Smith and Joffe, 2009). In a series of papers, O’Neill and colleagues (O’Neill, 2013; O’Neill, Boykoff, Niemeyer, and Day, 2013; O’Neill and Nicholson-Cole, 2009) found that dramatic and potentially fear-inducing images of climate impacts and extreme weather are good at capturing people’s attention (i.e., they have high ‘salience’) and make climate change seem more important, but they can also act to distance viewers (both psychologically and geographically), leaving them feeling overwhelmed rather than motivated to respond to the risks portrayed. Distressing photos may prompt a “helpless hopeless” feeling in the viewer (Banse, 2012), although this is partially contradicted by recent Australian research (Leviston et al., 2014). In their work, Leviston et al. (2014) found that dramatic images of climate change impacts (including natural disasters and melting ice) prompted strong negative feelings (alarm, anger, fear, upset or frustration) and increased arousal, but these feelings did not undermine their willingness to respond. Images of climate ‘solutions’ tend to make people feel more able to do something about climate change (they have high ‘efficacy’), but at the same time can reduce people’s sense that the issue is an important one (O’Neill and Nicholson-Cole, 2009; O’Neill et al., 2013). A recent study replicated these findings in a cross-national sample from Germany, Austria, and Switzerland (Metag et al., 2016).

A similar tension exists around using ‘localized’ versus ‘distant’ climate images. Perhaps the most iconic climate change image—the polar bear—has come to function as the primary visual cue associated with the issue (Doyle, 2007). However, images such as this have become problematic, as they appear to actively reinforce impressions of climate change as a distant issue (Manzo, 2010) rather than motivate increased interest, concern, and intentions to act. Nicholson-Cole (2005) found that focus group participants often explain that they are more touched by national and local imagery because it is easier to relate to and consequently is more upsetting. However, in research by O’Neill and Hulme four years later, the same reasoning was used by participants to say why local icons are disengaging: “it will only affect locals and is not as much of a global issue” (O’Neill and Hulme, 2009). A recent review of the

research suggests that reducing the perceived distance of climate change may actually have unanticipated effects on engagement (McDonald et al., 2015). Existing evidence regarding the impacts of highlighting local versus distant or global impacts of climate change on affect and issue engagement remains mixed (McDonald et al., 2015), and no research has carefully examined the importance of distance in the context of climate change imagery specifically.

Other aspects of the evidence base are more straightforward. People find it easier to engage with images if they include people (Banse, 2013; Nicholson-Cole, 2005; Braasch, 2013), and where direct eye-contact can be made with the subject of the image (Banse, 2013). While these conclusions are virtual ‘truisms’ among photographers, it is instructive to reflect on the images that participants in survey research spontaneously associate with the term ‘climate change’ (typically polar bears and ‘smokestacks’), which do not necessarily conform to these principles (Leiserowitz, 2006; Smith and Leiserowitz, 2014). As even this brief review of the literature highlights, therefore, there is a need for research that provides advocates with an evidence-based assessment of climate imagery impacts on audiences.

### 1.2. The present research

One of the central goals of the present research was to explore non-experts’ perceptions of and reactions to different forms of photographic climate change imagery in a manner that would enable us to extract applicable insights to use in developing a public database of climate change photographs ([www.climatevisuals.org](http://www.climatevisuals.org)) for use by groups or individuals interested in climate change communication, such as climate change advocacy organizations, bloggers, or journalists. Therefore, the methodological and analytical approach of the research was primarily and purposefully exploratory in nature, with the imagery selected and questions examined being centrally guided by the goal of making practical and ‘actionable’ recommendations for climate change communication. To gain a robust assessment of perceptions and responses to climate change images, we utilized both qualitative (structured discussion groups) and quantitative (experimental survey) methods. In both cases, participants were presented with a variety of photographs depicting climate change causes, impacts and solutions, and we assessed their reactions to these images ranging from their comprehensibility and aesthetic appeal to the emotions and motivations they evoked. Based on the extant literature, we anticipated that four broad features of images would be particularly important in shaping responses.

First, images of climate change solutions were expected to generate the most positive affective reactions, whereas we expected images of causes and impacts to lead to more negative emotional responses (O’Neill et al., 2013). Second, images depicting ordinary people, particularly those either needing help (e.g., flood relief) or actively engaging in low-carbon behaviors (e.g., installing solar panels), were anticipated to be effective at “personalizing” climate change, increasing concern, and motivating a sense of efficacy. Third, given recent evidence suggesting that depictions of climate change as localized can produce mixed reactions (e.g., reducing geographical distance vs. reducing temporal distance; McDonald et al., 2015; see also Rickard et al., 2016), we expected that there would be contrasting or even conflicting results with regard to images that depicted ‘distant’ versus ‘localized’ images. Finally, given the importance of high-quality visuals for catching attention and promoting engagement (cf. O’Neill and Smith, 2014), aesthetically appealing images that are evaluated as authentic and/or entertaining were expected to increase the extent to which participants would engage with and attend to images favorably.

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