

This article was downloaded by: [University of Nottingham]

On: 29 April 2014, At: 10:15

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## Science as Culture

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/csac20>

## Images of Extreme Weather: Symbolising Human Responses to Climate Change

Brigitte Nerlich<sup>a</sup> & Rusi Jaspal<sup>b</sup>

<sup>a</sup> School of Sociology and Social Policy, Institute for Science and Society, University of Nottingham, Nottingham, UK

<sup>b</sup> School of Applied Social Sciences, Faculty of Health and Life Sciences, De Montfort University, Leicester, UK

Published online: 11 Oct 2013.

To cite this article: Brigitte Nerlich & Rusi Jaspal (2013): Images of Extreme Weather: Symbolising Human Responses to Climate Change, *Science as Culture*

To link to this article: <http://dx.doi.org/10.1080/09505431.2013.846311>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Versions of published Taylor & Francis and Routledge Open articles and Taylor & Francis and Routledge Open Select articles posted to institutional or subject repositories or any other third-party website are without warranty from Taylor & Francis of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. Any opinions and views expressed in this article are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor & Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms &

Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

Taylor & Francis and Routledge Open articles are normally published under a Creative Commons Attribution License <http://creativecommons.org/licenses/by/3.0/>. However, authors may opt to publish under a Creative Commons Attribution-Non-Commercial License <http://creativecommons.org/licenses/by-nc/3.0/>. Taylor & Francis and Routledge Open Select articles are currently published under a license to publish, which is based upon the Creative Commons Attribution-Non-Commercial No-Derivatives License, but allows for text and data mining of work. Authors also have the option of publishing an Open Select article under the Creative Commons Attribution License <http://creativecommons.org/licenses/by/3.0/>.

It is essential that you check the license status of any given Open and Open Select article to confirm conditions of access and use.

# Images of Extreme Weather: Symbolising Human Responses to Climate Change

BRIGITTE NERLICH\* & RUSI JASPAL\*\*

\*School of Sociology and Social Policy, Institute for Science and Society, University of Nottingham, Nottingham, UK, \*\*School of Applied Social Sciences, Faculty of Health and Life Sciences, De Montfort University, Leicester, UK

**ABSTRACT** *Extreme weather events have been increasingly in the news, accompanied by images. At the end of 2011, when such reports were ever present, the International Panel on Climate Change published a draft report on extreme weather and climate change adaptation. This report itself was covered in the news and illustrated with images. Some of these depicted 'extreme weather', in particular with relation to floods, droughts and heat waves, hurricanes and ice/sea-level rise. For this article, these images were studied using visual thematic analysis, with a focus on examining the way they may symbolise certain emotional responses, such as compassion, fear, guilt, vulnerability, helpless, courage or resilience. Climate change communicators have examined the way that evoking such emotions in verbal communication can lead to engagement or disengagements with the topic of climate change. However, while researchers have also become increasingly interested in climate change images, they have not yet studied them with respect to symbolising certain emotions. Various typologies of images have been proposed in the past, distinguishing, for example, between human and natural impact images or iconic and geographically specific images. The images studied here do not neatly map onto these distinctions. They symbolise human suffering and loss and they are sometimes geographically and socially distinctive, but they are also iconic of climate change and they are symbols of its natural impacts. They all, to some extent, symbolise helplessness and may thus lead to disengagement rather than engagement with the issue of climate change.*

**KEY WORDS:** extreme weather, climate change, images, visual communication, sociology

---

Correspondence Address: Brigitte Nerlich, School of Sociology and Social Policy, Institute for Science and Society, University of Nottingham, Nottingham NG7-2RD, UK. Email: [brigitte.nerlich@nottingham.ac.uk](mailto:brigitte.nerlich@nottingham.ac.uk)

© 2013 The Author(s). Published by Routledge.  
This is an Open Access article. Non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly attributed, cited, and is not altered, transformed, or built upon in any way, is permitted. The moral rights of the named author(s) have been asserted.

In the past, the link between climate change and extreme weather has generally been hedged with caveats, as the process of unpicking signal from noise in weather data is extremely difficult. However, this link is now being strongly manifested in the domains of scientific evidence (Peterson *et al.*, 2012), public perception (Drajem, 2012; Kolbert, 2012) and media coverage (Gillis, 2012; Harvey, 2012; Marshall, 2012; Fischer, 2013). Moreover, in the past social scientists and media and communication analysts have mainly focused on studying how climate change is depicted in text (traditional media and social media). There is now growing recognition of the importance of investigating how climate change is conveyed in visual images (Nicholson-Cole, 2005; O'Neill and Hulme, 2009; Smith and Joffe, 2009; Doyle, 2011). This article sits at the intersection of these two trends. It attempts to gain insights into the ways in which visual images are used in media reporting on the dangers, impacts and possible consequences of climate change, focusing in particular on the emotions that are symbolised in images used to illustrate issues around extreme weather and climate change.

In the past, images of (relatively rare and sensational) extreme weather events were used to convince people of the reality of and threats posed by climate change (see Brönnimann, 2002). Such images were, to some extent, more symbolic than real, such as the flooding of Cologne cathedral on the front page of *Der Spiegel* in 1986, for example, Von Storch and Krauss (2005). This image has now become, for some, a symbol of climate alarmism or catastrophism (e.g. Rosenthal, 2010). More recently, images of extreme weather have become more frequent and more commonplace in media reporting from around the world. They are no longer just symbols of the possible dangers posed by climate change, but rather used as documentary evidence of its reality and its causes. As Smith and Joffe (2009, p. 649) have argued, extreme weather events provide 'news organisations with concrete evidence strengthening the argument that climate change is caused by human activity'. They can, however, still be used symbolically, in the sense that they convey emotions that go beyond their immediate content and may influence how people think and talk about climate change.

In this paper, we examine a subset of images that are situated at the interface of the symbolic and the documentary; that is, images which document particular extreme weather events from around the world, but which also symbolise climate change. These are images of extreme weather used to illustrate articles and blogs written after the release of the draft of a special report on extreme weather events and climate change adaptation by the United Nation's *Intergovernmental Panel on Climate Change* (IPCC, 2011) on 18 November 2011. This report was published at the end of a year marked by what is increasingly called 'extreme weather events' (NOAA, 2011), such as the drought in Texas, Hurricane Irene hitting the East coast of North America, floods in Thailand and Pakistan and so on.

We do not study the IPCC report itself or media reports of particular extreme weather events, and neither do we examine the increasing number of articles that speculate about the link between extreme weather and climate change. We focus instead on images which were chosen by news outlets to illustrate their coverage of the IPCC extreme weather and climate change report. We hope that this may provide us with some initial insights into extreme weather images that are chosen to represent the link between weather and climate.

Our aim is to examine what messages, or ‘emotional value’, may be symbolised and conveyed by such images. We use emotional value in a sense that is similar to the semantic study of connotations and emotional values of words (*Gefühlswert*, as introduced by Erdmann, 1896, pp. 8–90, 223; Konstantinidou, 1997). Do the chosen images entail messages of hope or despair, resilience or vulnerability, closeness or distance (both in time and in space), human ingenuity or the forces of nature? Which of these representations or emotions are foregrounded or backgrounded? It should be stressed that we study what emotions may be symbolised and conveyed by the images, not what emotions are triggered in actual viewers of these images. This would have involved a very different research design (see e.g. Beattie and McGuire, 2012).

In the following we shall first provide some background on media coverage of extreme weather and climate change, the study of visual imagery in the context of climate change, then present our method of image extraction and analysis, before going on to analyse a small corpus of images using visual thematic analysis. We conclude by discussing our findings critically in the context of existing research.

### Images, Climate Change and Emotions

Despite the frequent use of images in the mass media, even in relation to environmental concerns such as climate change and extreme weather (Nicholson-Cole, 2005; O’Neill and Hulme, 2009; Smith and Joffe, 2009; Doyle, 2011), a systematic study of their potential impact on societal understandings and representations of extreme weather, in particular, remains patchy (Domke *et al.*, 2002). In recent years, however, there has been a marked increase in social science attention on the images used in the context of climate change and we shall draw on some of that literature, in particular the work of Hansen and Machin (2009) and Lester and Cottle (2009). Both make important distinctions that we have to keep in mind in our analysis.

Lester and Cottle (2009) distinguish between natural impact visuals such as dripping glaciers, which are disconnected from humanity, and human impact visuals such as victims wading through floods, which symbolise human suffering and loss. Interestingly, what Lester and Cottle call ‘disconnected images’ seem to overlap with ‘imageries’ of climate change observed among participants in an empirical study conducted by O’Neill and Nicholson-Cole (2009). When asked to

conceptualise climate change, many participants spoke about ‘[m]elting glaciers and icebergs, visions of the sea level rising and inundating coastal regions or countries, intense heat and drought [...] landscape changes [...] disastrous weather extremes’ (p. 368). This may be related to a trend summarised by Hansen and Machin (2009), namely ‘that television and other media visualize the environment through the use of increasingly ‘symbolic’ and ‘iconic’ images rather than those which are recognizable because of their geographic/historical or socially specific identity’ (p. 779). What does this mean for the emotional value or force of such images?

There has been a long-standing interest in the psychology of images, on which we also draw, as we are interested in what emotive force the images we study may have. There is evidence that visual images can induce emotions, as exemplified by an experimental study of how visual imagery of the Kenneth Bigley kidnapping induced fear among readers of the accompanying text (Iyer and Oldmeadow, 2006). At a social level, images can come to constitute culturally shared symbols of abstract issues, such as climate change, in particular cultural settings (Moscovici and Hewstone, 1983). There is evidence for this effect in the widespread societal recognition of the cross as a cultural *symbol* of Christianity, the white dove as a symbol of peace, the Twin Towers as symbols of terrorism or, indeed, resilience, and the polar bear as a symbol of climate change (Turner, 1967; Doyle, 2007). In her work on images of HIV/AIDS, Kitzinger (1995) has convincingly argued that the widespread use of particular images by the media results in the adoption of these images by the public, highlighting a correlation between media representation and cultural understanding. Similarly, Joffe (2008) has argued that visual images can have a ‘positioning power’ in forging particular representations, which highlights the importance of examining visual images of extreme weather.

It is possible to differentiate between individual-level and social-level emotional value in visual images. While individual differences do play a role in how some images may be processed by individuals (Iyer and Oldmeadow, 2006), in many cases images can evoke social emotions throughout a particular group or society due to the hegemonic or ‘iconic’ status of a given images and the shared cultural understandings surrounding it (Geertz, 1973). Images can become imbued with emotion, which can in turn come to form part of the cultural landscape. Given that emotion plays an important role in attributing social meaning to information (Zajonc, 1998), this article examines the emotional value and emotive messages of extreme weather contained in a corpus of images of extreme weather used in the context of a debate about climate change mitigation and adaptation. We focus on emotions as what one may call social currency symbolised and conveyed by the images we study rather than individual psychological responses.

### Extreme Weather, Climate Change and the Media

It has been suggested that images of extreme weather are used to sell newspapers, despite the fact that the link between extreme weather events and climate change is not a direct one (Brönnimann, 2002). Indeed, the link between extreme weather events and climate change continues to be hotly debated, but there seems to be a shift towards attributing extreme weather events to climate change (e.g. Doyle, 2012). However, surprisingly, it seems to be increasingly difficult to sell news stories on climate change or global warming in general, even during years of weather extremes like 2011. Studies show that news coverage of climate change took a steep plunge in 2010 (Brulle *et al.*, 2012), suggesting that climate change is deemed to be less newsworthy than before (Figure 1).

And yet, while reporting on climate change has decreased after a spike around 2009 (which can be attributed to ‘climategate’ as well as the 15th Conference of the Parties to the United Nations Framework Convention on Climate Change or COP15 in Copenhagen in December 2009), reporting on extreme weather has in fact increased over the last few years (Figure 2). This may be attributed to the tangible nature of extreme weather (unlike climate change, which is largely abstract and invisible) and its immediately perceptible real-world consequences for human beings. Figure 2 is based on data derived from the Nexis® database (a searchable database of news articles, some blogs, wires, etc.). Nexis® was searched for each

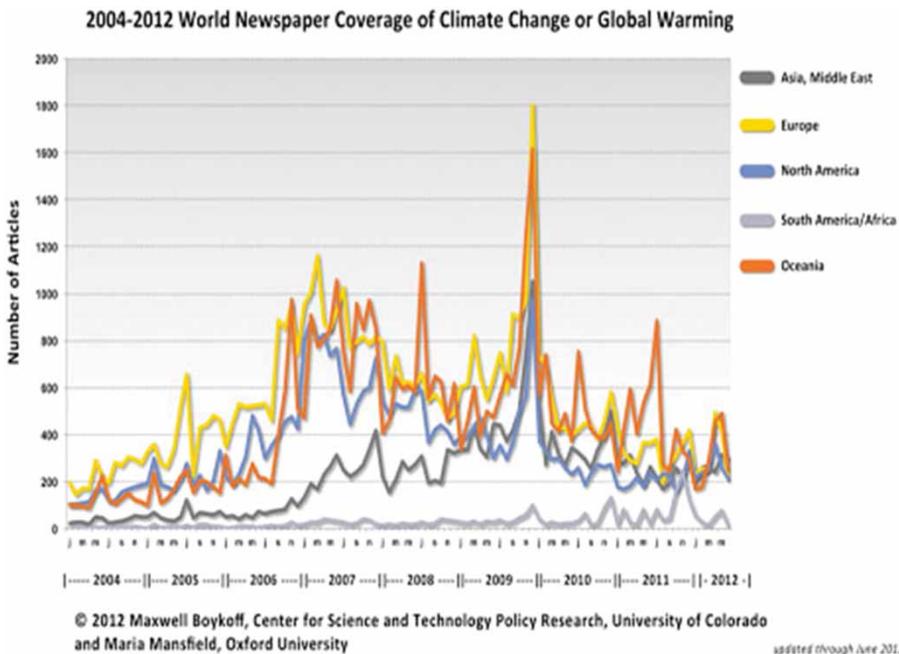
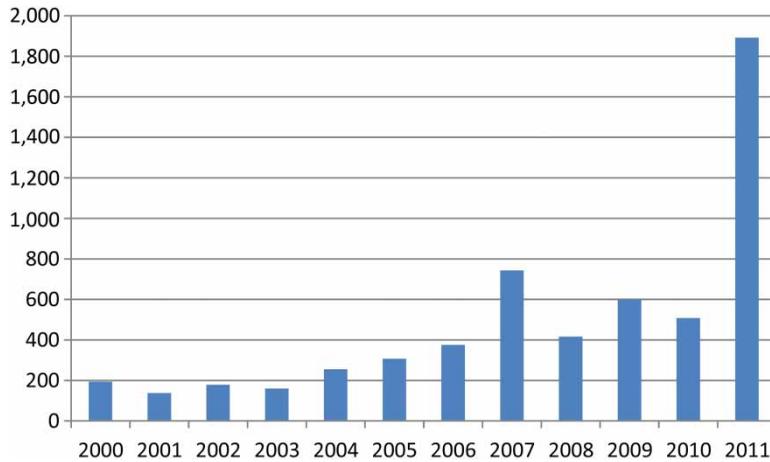


Figure 1. Media coverage of climate change across the globe.



**Figure 2.** Major World Newspapers (English) coverage of ‘extreme weather’.

year (between 2000 and 2012) with the keywords ‘extreme weather’ and ‘climate change’ or ‘global warming’, focusing on ‘Major World Newspapers’ (English) (on a high similarity setting).

The results show that media interest in ‘extreme weather’ is increasing, even after 2007, when, more generally, media interest in climate change has declined (Figure 1). Thus, while extreme weather might have helped drive media interest in climate change in the past (Carvalho and Burgess, 2005; Boykoff, 2007, Corfee-Morlot *et al.*, 2007; Ward, 2009), it seems now to have achieved momentum by itself, almost decoupled from media coverage of climate change.

Extreme weather is often disastrous and disasters attract global media attention. The way disasters are covered by the media may, however, be changing, as claimed by Pantti *et al.* (2012), perhaps because of the increasing frequency of disastrous weather events. Pantti *et al.*’s (2012) work shows ‘how the ideal of objectivity might be challenged by new, more emotional and more compassionate forms of story-telling premised on an injunction to care’ (book blurb). Our article deals with the emotional value of images that were chosen to accompany reporting of an IPCC report on extreme weather, rather than with journalistic norms. In the following, we shall explain how we generated the corpus of images we studied and how we proceeded to analyse them.

## Method

### *Data Collection*

Images of extreme weather events appeared throughout 2011, but a systematic collection of such images from all over the world would not have been feasible, particularly for an in-depth qualitative analysis. When the IPCC published a (draft)

report about climate change and extreme weather towards the end of 2011,<sup>1</sup> we saw this as a good opportunity to investigate how this report would be reported in the media and, more importantly, what images of extreme weather would journalists, editors and bloggers choose to illustrate their articles on this report. We assumed that this might provide us with access to a limited and well-circumscribed corpus of extreme weather images, used in the context of climate change, in a timely and systematic fashion. However, it should be stressed that we are not analysing journalistic practices in this paper, we are analysing the images as ‘text’ and study them in the way discourse analysts study texts, their messages and their meanings, without necessarily probing the intentions and practices that drove the productions of such texts or indeed the reception of the articles and images by readers.

While the Nexis® online newspaper database provides access to text from newspaper articles and is therefore something like a goldmine for discourse, media and communication analysts, it does not store images. As a means of generating visual data, we therefore turned to ‘web scraping’ which refers to a computer software technique for extracting textual and visual information from websites stored on Mozilla Firefox. This allowed us to pull out all articles and their accompanying images on Google News (accessed on Google UK), which contained the keywords ‘IPCC’ and ‘extreme weather’ two days after the release of the IPCC report. This generated a corpus of 1,052 articles from all over the English-speaking world, which remained ‘stable’ for at least a week. Articles were searched for duplicates and at the end 250 articles remained. Of these, 132 contained no images and were therefore discarded. This left a final corpus of 118 articles containing images for us to analyse.

### *Data Analysis*

A number of visual methodologies are available for the study of images, from visual semiotics to discourse analysis, as detailed in Rose’s (2001) seminal work *Visual Methodologies*. Some recent work on visual imagery relating to climate change has used critical discourse analysis and multimodal discourse analysis (Hansen and Machin, 2009). In our work we opted for a slightly different approach, by mapping thematic analysis of texts onto the analysis of images, following Linder (2006) who pointed out that ‘images can be analyzed as text; that is, they can be broken up into elements and linked to meanings, in the same way that text can be reduced to words that have denotative and connotative associations’ (p. 108). We focused on the images alone, as the text underneath the images was, in most cases, irrelevant, providing the name of the photographer or press agency, mentioning the IPCC report or, in some instances, describing the contents of the images in a matter of fact way, such as ‘Pakistani mother carrying two children’ or similar.

We analysed our corpus of images by adapting qualitative thematic analysis to the study of images. Thematic analysis has been described as ‘a method for identifying, analysing and reporting patterns (themes) within data’ (Braun and Clarke, 2006, p. 78) and the constructionist variant of the technique can be employed to ‘unpick or unravel the surface of “reality”’ (p. 81). Here the method is employed in order to identify key themes (including emotional themes) characterising our corpus of images of extreme images. ‘Keyness’ of the themes is determined by their ability to capture the ways in which images attach social meaning to the phenomenon of extreme weather.

Our aim in this paper is to provide a rich thematic description of this relatively small corpus of images, which is particularly useful given the dearth of research into these kinds of images of extreme weather. For the same reason, we adopt an inductive approach whereby the themes are closely linked to the data themselves, and thus the analysis is data driven rather than interpreted through the lens of pre-existing theory (cf. Jaspal and Nerlich, forthcoming).

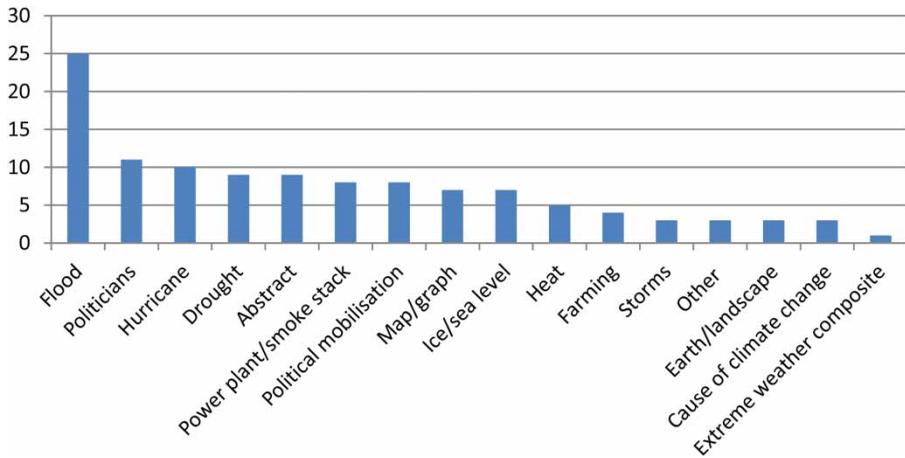
Thematic analysis can allow the analyst to integrate the micro and macro levels of analysis. Indeed, our analysis:

goes beyond the semantic content of the data [that is, the micro level], and starts to identify [...] the *underlying* ideas, assumptions and conceptualizations—and ideologies—[that is, the macro level] that are theorized as shaping or informing the semantic content of the data. (Braun and Clarke, 2006, p. 84)

Although thematic analysis has typically been employed in the analysis of textual data sets, it is applicable to the study of images given that patterns of meaning can be observed across a visual corpus just as they are observable across a textual corpus. Accordingly, this study applies thematic analysis to the analysis of *visual* representations in order to identify messages, symbols and meanings, including emotive meanings, conveyed by the images of extreme weather. We refer to this approach as *visual thematic analysis*.

### *Procedure*

There were three stages of data ordering and thematic coding. First, we listed all articles we had extracted through ‘web scraping’ on a spreadsheet. We then reduced this list to only those articles containing images. The second step consisted of coding. Selected images were first roughly coded by one of the authors in terms of what type of extreme weather event they represented (focusing on denotative meaning). This rough coding was discussed in detail between the authors, focusing especially on the thematic coding categories used (Braun and Clarke, 2006).



**Figure 3.** Thematic coding of images used in articles on 2011 IPCC report.

The third step consisted of final coding. The focus was on the symbolic emotional content as perceived by the coders. We cannot access either the intention of the photographers that produced the images or the intentions of the journalists who used them. Neither can we access the emotional reactions provoked by the images in actual readers.

After the initial coding and discussion, detailed coding of meanings and messages was undertaken collaboratively by both authors until final categories and descriptions emerged. Collaborative coding in this manner is one means of safeguarding quality in qualitative (visual) research (Elliott *et al.*, 1999; Banks, 2008) (Figure 3).

In the detailed analysis, we focused on extreme weather in particular, that is, on images of events, causes and outcomes of extreme weather, namely hurricanes, floods, drought, heat, and ice- and sea-level rise. We noted down emerging theme titles which captured the semantic and emotive qualities of the images. This procedure was repeated with each image. These initial codes included *inter alia* the general tone of the image, its potential emotional value, the presence/absence of human beings, and emerging patterns within the data. Subsequently, these initial codes were collated in order to create themes characterising the corpus of images. Finally, superordinate themes representing the themes derived from the analysis were developed and ordered into a logical and coherent narrative structure.

## Analysis

This section focuses upon images of flooding; drought; heat; hurricanes; ice and sea level; and the underlying assumptions, meanings, conceptualisations and

messages that they may convey to readers. Section headings are used to indicate overarching themes.

*Flood Images: 'Us and Them; or Are We All in the Same Boat Now?'*

As the largest category of images, the 25 images of flooding and the aftermath of flooding fell into two groups. One set of images depicts flooding as a geographically distant form of extreme weather, while the other represents it as 'closer to home'.

*Flooding in developing countries: 'getting on with it'.*

One group of images depicts people in non-Western contexts as 'getting on with it', thereby distancing extreme weather from the Western viewer of these images. These are, on the one hand, 'human impact' images in the sense of Lester and Cottle (2009), but at the same time 'disconnected images' in the sense of Nicholson-Cole (2005).

There is, for example, an image of a Pakistani mother standing in deep flood water holding up her two children.<sup>2</sup> Despite the clearly very grim conditions, signalled by the dull and dirty colour of the water and its depth to neck level, the woman and her children appear to be 'getting on with it'. The two children are both smiling, despite being almost entirely submerged in water, constructing a sense of resilience to or courage in the face of this form of extreme weather, as well as its seeming mundaneness in this particular geographical context. One of the children has visibly wet hair, which, coupled with his cheerful demeanour, gives the impression that he has just enjoyed a swim in the water, rather than traversing it helplessly as a flood *victim* might. The mother, a Pakistani woman with a traditional, religious appearance, retains her headscarf intact, as prescribed by her rural Pakistani Muslim culture. This too seems to suggest that this is not a matter of life and death but rather an aspect of everyday life in this geo-cultural context. In short, the visual representation of the protagonists in the image is not one of victimhood or desperation, but rather of a mundane sense of routine.

Reiterating the geo-cultural distance of the groups and individuals represented in contexts of flooding, other images depict a visibly East Asian man in deep flood carrying his belongings on a bicycle<sup>3</sup> and a Buddhist Thai man carrying belongings on his back,<sup>4</sup> both wearing prototypical conical hats. There are other images of a traditionally dressed Pakistani woman with a child,<sup>5</sup> of two Indian women in a deep flood, looking towards the horizon;<sup>6</sup> and of a whole community in a deeply flooded street, walking or travelling by rickshaw.<sup>7</sup> This image of the whole community in a flooded street in India also contributes to the general message that people in distant lands are used to extreme weather and therefore just 'getting on with it'. The image captures the whole length of the street which is completely congested with human beings busily engaged in their daily activities, such as travelling by foot and by rickshaw. Moreover, there are some

perceptible smiles on the faces of groups of children playing in the water. The sheer diversity of people depicted in the image, of both genders and distinct generational groups, accentuates the communal element in ‘managing’ or responding to extreme weather in this particular geographical context. It is noteworthy that the community does not seem vulnerable to threat or danger. Rather, it responds to extreme weather in a most resilient manner. In those images that distance extreme weather from ‘the West’ we have a depiction of both toughness and mundaneness, which might be implicitly contrasted with vulnerability and extraordinariness that still prevails in the West with regard to extreme weather events (Palutikof *et al.*, 2004).

Accordingly, these images do not convey the emotion of compassion, since the protagonists in the images are not portrayed as victims and they are distanced from the viewer. Crucially, flooding does not seem to be represented in terms of extreme weather for the individuals depicted, many of whom even seem to express happiness through their smiles. Moreover, the representation of individuals continuing with life, rather than ‘fighting for’ their lives, essentially distances them from the category of victims of disaster and calamity.

*Flooding in the industrialised world: ‘we are in it too’*

This subgroup of flood images brings extreme weather closer to the industrialised world. These are human impact images but they are less disconnected than the previous group. One image,<sup>8</sup> for example, shows a foreign tourist wading through very deep floods in Vietnam, indicating that extreme weather does not only affect those living far away in foreign countries. Although the image depicts Vietnam, a developing far eastern country, the ‘victim’ is recognisably a Western individual. This symbolically objectifies flooding in terms of its negative consequences for ‘us’ in a more general sense (Jaspal and Nerlich, forthcoming). Crucially, there is a visible difference in how the foreign tourist and how South and East Asians (as noted in the previous subsection) respond to this form of extreme weather. The foreign tourist has a sombre expression, as if enduring great difficulty, while the South and East Asians are represented as ‘getting on with it’. This seems to indicate that ‘we’, that is, inhabitants of the Western world, are not only susceptible to the threat of extreme weather, but that we are less able to cope with it.

Another image depicts an East Asian man wearing a baseball cap cycling through a flood in Bangkok.<sup>9</sup> His Western attire positions him and his surroundings as ‘closer’ to ‘us’. Like the image of the foreign tourist, this image too constructs extreme weather in negative terms with perceptibly disruptive outcomes for humans. The sombre demeanour and difficulty with which the man is cycling through deep flooding visually convey a message of disruption and negativity.

We argue that these images, despite representing a non-Western context, and other images explicitly depicting industrialised countries collectively position

flooding as a form of extreme weather to which ‘we’ too are susceptible. Unlike the previous sub-theme which discusses images of flooding in developing countries, none of the individuals portrayed in these images appear to be ‘getting on with it’. An image of the Black American woman sitting alone on a doorstep,<sup>10</sup> for instance, depicts the aftermath of extreme weather as being devastating for those affected. It presents a geographical setting familiar to viewers in industrialised countries; there is modern housing which is surrounded by modern automobiles. The woman is seated on a chair surrounded by flooding, estranged from other human beings, which is a marked departure from the sense of solidarity and communal activity depicted in the previous subsection. The woman exhibits a gloomy appearance, symbolising suffering, helplessness and victimhood.

This desolateness of individuals affected by flooding is further illustrated in an image of a man engulfed in heavy rain and flooding.<sup>11</sup> The bird’s eye view of the man in the centre of the flood, struggling to move in the heavy downpour, magnifies the power of the rainstorm, suggesting a sense of futility. As suggested above, the sense of community and communal living manifested in the first group of flood images is notably absent from these images. While the first group shows groups and communities ‘getting on with it’, these images seem to depict the suffering of individuals who, perhaps due to their lack of community, are less resilient.

There are also images of objects of civilisation affected by floods, such as suburban houses, a market with canopies, a car in a flooded car park and people in a dinghy. Three more images bring extreme weather and ‘civilisation’ even more closely together; one image shows planes on a submerged runway in Thailand,<sup>12</sup> another of cars smashed together after a flood in Genoa, Italy,<sup>13</sup> and one of a car leaving a carwash after some severe flooding.<sup>14</sup>

While visual representations of extreme weather in developing countries tend to depict the resilience of groups of individuals getting on with their lives in the face of extreme weather, images in the industrialised world tend to focus upon the aftermath of extreme weather and human suffering induced by extreme weather events. This is apparent in the image of a heavily damaged suburban house and another that remains structurally intact but almost entirely immersed in water.<sup>15</sup> Readers in the West would be able to identify with these buildings, which attenuates the distance between the in-group and the phenomenon of extreme weather. Such images of extreme weather events and their victims may convey compassion, due to the accentuation of hardship and suffering, unlike images of extreme weather in the developing world. On the other hand, images of flooding in Western countries may also symbolise a sense of fear, since these forms of extreme weather are brought closer to the immediate in-group. Indeed, it has been demonstrated that individuals tend to be more concerned with their immediate in-groups than out-groups, sometimes generalising hardship and negativity associated with these group memberships to the self (Cohen, 2001).

*Drought Images: 'Where Have All the Humans Gone?'*

Unlike the images of flooding, the drought images do not reproduce the 'us versus them' dichotomy, partly because most images seem to depict droughts in the Western world. These images are more abstract and figurative than images of flooding. Cracked earth comes to symbolise drought, making this abstract phenomenon culturally and psychologically tangible (Moscovici, 1988). These are, to use Lester and Cottle's (2009) terminology, more natural impact images, where the absence of humans symbolises the destructive force of nature.

In the images of cracked earth (as a symbol of drought), there is some presence of humans, but only sparingly, such as a pair of legs walking on cracked soil. This constitutes a metaphorical symbol of the scarcity of (human) life, which is afforded lesser visual importance in images of drought. In one image,<sup>16</sup> the cracks in the earth are foregrounded and thus magnified in size, while the pair of legs is relatively smaller in size. This seems to create the impression that the cracks represent a hazard to human beings and that the legs (as a metonymic symbol of human life) could easily disappear between the cracks. These images symbolise immediate threats and may convey a sense of fear and anxiety (Höijer, 2010).

In addition to the scarcity of human beings in drought images, there is a marked absence of plants and animals, thus conveying an image of morbidity and an aging planet. Even the legs and feet that are still visible in the image, which symbolise human life, are covered in dried-out mud, signalling a complete absence of water and even moisture. It seems that the ageing/morbidity constructed by this symbol of scarcity of life is slowly engulfing the only remaining symbol of life in the image. In the only other image depicting a human being,<sup>17</sup> a man is toiling across a barren landscape strenuously attempting to carry two buckets of water.

Unlike the images of flooding, this image more explicitly relates drought to human suffering, given the clearly arduous task of the barefoot man having to traverse the dried-out terrain with large cracks. In both images, people are barefoot and thus seem more vulnerable to drought. This is similarly observable in an image of a large barren landscape,<sup>18</sup> with leafless twigs of a lifeless tree in the foreground, and a dried-up lake in the background. The images symbolise threat and fear. However, the clear depiction of human suffering, despite the scarcity of human life in the images, may also convey compassion.

The emotions of fear and compassion are further implied in other drought images, which construct imagery of premature ageing and morbidity. Symbols of death litter a landscape in the shape of animal carcasses, skeletons and desiccated trees. Two images depict almost entirely devoured animal carcasses,<sup>19</sup> establishing links between images of drought and imagery of death and destruction and implicitly constructing drought as a cause of death and destruction (Hewstone and Augoustinos, 1998). Overall, the drought images present a solemn, grey, gloomy aspect suggestive of an unnatural, premature ageing of the earth. Humans

are depicted as isolated, solitary individuals, and there is no sign of communal action. One is left with the impression that it is impossible for humans to protect each other, let alone protect animals and plants from dying. This constructs a sense of powerlessness of human beings and futility of attempting to safeguard life (animal life, human life and life of the planet).

#### *Heat Images: 'Apocalypse Now'*

The heat images unanimously depict an orange or yellow heat haze, what one news report called an 'orange post-apocalyptic sun',<sup>20</sup> juxtaposed with either rows of cars on a highway or rows of palm trees near a highway. Images are blurry and hazy because of the extreme heat and searing sun. Again, these images are symbols of the power of nature and its impact on human life. However, natural impact is mediated by human impact.

Unlike the drought images, which at least present subtle symbols of human beings, the heat images do not depict humans at all. However, rather than explicitly representing the impact of extreme weather on human beings, as is the case with both the drought and flood images, the heat images tend to represent human beings (and their activities) implicitly as a cause of extreme weather (in this case, extreme heat) (Jaspal and Nerlich, forthcoming). Extreme heat is visually linked to human industrial activity. One image features orderly rows of cars driving away from a towering and overpowering sun.<sup>21</sup> The traffic jam, with all five lanes congested, establishes a visual link between cars and pollution as the cause of such extreme weather (Figure 4).



**Figure 4.** Heat. Credit: image reproduced with permission of ©G. Darrel Jenerette, University of California, Riverside, USA. *Source:* article in which the image was used without attribution: <http://www.clickgreen.org.uk/analysis/general-analysis/122821-ipcc-report-warns-risks-from-extreme-weather-events-to-increase.html>.

Similarly, in another image,<sup>22</sup> two cars (with palm trees in the background) are set against a background of blurry and hazy imagery of extreme heat. A third image shows an Egyptian pyramid in orange surrounded by a heat haze.<sup>23</sup> While this is foregrounded, modern high-rise and industrial buildings are perceptible through the blurriness, visually linking extreme heat to modernity.

These images create interesting power differentials between the human beings and the extreme heat allegedly created by them. One image shows cars as driving away from the sun. This creates the impression that human beings are fleeing the sun's overpowering force. In our corpus of heat images, there is a general visual linkage between extreme heat and modernity (in the guise of motorways, industrial pollution, high-rise buildings, power lines, etc.). Like the drought images, this too performs an attributional function by implicitly constructing the extreme heat as a consequence of modernity (Hewstone and Augoustinos, 1998), which can be visually seen as one of the causes of anthropogenic climate change. These images, though potentially awe-inspiring in their aesthetic beauty (see Burke, [1757] 1998), are also symbols of fear; heat is constructed as being unbearable for human beings, resulting in them either fleeing it or being entirely absent from its glare in the first place.

#### *Hurricanes: 'Awe and Vulnerability'*

Although journalists or editors could have chosen images of the aftermath of hurricanes, most images of hurricanes in our corpus are (iconic) satellite images representing the hurricane as a truly global phenomenon. These then are symbolic or iconic images in the sense of Hansen and Machin (2009).

The earth is visible in its own iconic form of 'planet earth', which itself has become a symbol of the 'Earth Rise' environmental movement (Poole, 2008). In contrast to this originally positive image, in our corpus there is a sense that hurricanes are gradually engulfing the entire planet. This effect is accentuated in some images by focusing on a small area of the earth (rather than the earth in its entirety) which is almost totally covered by the hurricane. This symbolises danger, vulnerability and helplessness at the same time, since there seem to be few options for mitigation. In one image,<sup>24</sup> the planet is actually no longer visible. This creates the impression of wholesale destruction of the earth and, by extension, of humanity itself. Interestingly, there is a greater focus in the images on the process of engulfment, rather than the aftermath. Like other images depicting the imminent destruction of the earth as a result of extreme weather, the hurricane is a symbol of awe but also fear, primarily because there is minimal scope for mitigation; the process of destruction is represented as being firmly underway.

Consistent with the observation that there is a general focus upon the process of imminent destruction in hurricane images, only a few images depict the aftermath of a hurricane. Uprooted and lifeless trees together with a chaotic mishmash of nature and objects associated with civilisation collectively build up imagery of

danger, disaster and powerlessness.<sup>25</sup> This is similar to the visual linkages established between heat and modernity. Like other forms of extreme weather, hurricanes are represented in terms of gloom and destruction, imbuing these images with the emotional value of fear.

Like the drought and heat images, there is a noticeable absence of humans. This seems to be a representational tendency in images of extreme weather, which focus upon the process of imminent destruction. However, this is not to suggest that the images fail to capture the human implications of extreme weather. Rather, they unanimously construct hurricanes as utterly devastating for human life on this planet. They portray danger and collective global helplessness, resulting in the visual construction of overwhelming fear, coupled, as in the heat images, with an aesthetic pleasure in the sublime and awe-inspiring, in this case conveyed not through the colours orange and yellow but blue, green and white.

#### *Ice and Sea Level: 'On the Verge of Submergence'*

The overarching theme in images of melting ice and rising sea levels concern a remote and isolated island, atoll or iceberg populated by a lone polar bear or palm trees, on the verge of being overwhelmed by the sea. These are, again, iconic but also disconnected images of climate change which have quite a long history and tradition (Brönnimann, 2002).

One image depicts a small islet abundant in life and nature;<sup>26</sup> it shows visibly fertile land and swaying palm trees concentrated in a small space. The green colour palette is contrasted with the deep blue of the surrounding ocean. Together, the land and ocean represent life and nature. While there is no overt industrial or human-induced threat to nature, unlike other categories of images analysed, the image implicitly depicts nature itself as posing the threat. Like the heat images, size proportions construct particular 'power relations' between the various stimuli in the image. The relatively small size of the islet is contrasted with the overwhelmingly large surrounding ocean, which in turn creates the impression that the fertile islet (itself an objectification of life) is gradually being engulfed by the ocean. The constructed threat consists of nature engulfing nature, that is, the natural ocean is devouring the natural islet (similar to the much larger depiction of this process in the hurricane images). Consequently, these images appear to distance extreme weather from humans and, conversely, represent melting ice and rising sea levels to 'natural' causes. The absence of humans essentially distances extreme weather from human actions.

Another image,<sup>27</sup> by contrast, does show a group of human beings on an ice sheet that seems to be melting away beneath them (Figure 5).

This constructs the fragility of both the ice and humanity itself. Like other categories of images, the proportions of the ice sheets vis-à-vis the human beings highlights the particular vulnerability of humanity; for example, the survival of human traversing the ice depends on the survival of the ice itself. This image



**Figure 5.** Ice. Credit: image reproduced with permission of ©Jeremy Potter, NOAA, USA. *Source:* article in which the image was used: [http://www.upi.com/Science\\_News/2011/11/18/Climate-conference-warns-of-extremes/UPI-61611321639176/](http://www.upi.com/Science_News/2011/11/18/Climate-conference-warns-of-extremes/UPI-61611321639176/). Original caption: “Scientists tread carefully through a seemingly endless landscape of ice, sea, and meltwater in the Canada Basin of the Arctic on July 22, 2005. The blanket of ice coating Earth’s northernmost seas was thin and ragged in July, setting a record low for sea ice extent for the month. Sea ice stretched across only 3.06 million square miles whereas the long-term July average is 3.9 million. Scientists note that this breakup of ice is a result of global warming. Photo made from the U.S. Coast Guard Icebreaker Healy. UPI/Jeremy Potter/NOAA.” Jeremy Potter, who gave us permission to use this image, told us (email 2 January 2013) that “the photo was taken at approximately midnight on July 22, 2005 during a month-long NOAA sponsored high Arctic expedition (<http://oceanexplorer.noaa.gov/explorations/05arctic/welcome.html>). The primary science mission was to explore the biodiversity of the sea ice, pelagic, and bottom habitat of the deep Canada Basin. We hoped the data and information would help establish a baseline against which to measure Arctic change. The photo is taken from the US Coast Guard Icebreaker Healy and shows the underice scuba team returning to the ship after a dive. Though the UPI article’s caption seems to give the opposite impression, this particular science mission did not focus on measuring sea ice breakup and sea ice reduction due to climate change.”

and another satellite image of the Earth highlight the magnitude of melting ice and rising sea levels. The satellite image focuses on a relatively small area of the Earth’s surface,<sup>28</sup> depicting the green land, blue seas and oceans and distinctively white ice sheets in North Pole region of the planet. The proportion of the white ice sheets vis-à-vis the rest of the planet constructs melting ice sheets and rising sea levels as a large-scale environmental problem. Due to the constructed magnitude and imminence of this form of extreme weather, melting ice and rising sea levels may provoke feelings of fear and helplessness.

## Discussion

In our case study of images accompanying media reporting of the 2011 IPCC report, we have examined visual representations of extreme weather and the emotive messages that may be associated with them. It should be stressed that this article does not aim to provide a comprehensive overview of all visual representations of extreme weather but rather it considers how particular social and

emotional meanings come to be associated with extreme weather in a limited corpus of images.

### *Emerging Visual Representations of Extreme Weather*

The analysis reveals four emerging visual themes of extreme weather. First, images of flooding in the corpus construct a *visual theme of people in the developing world 'getting on with it'*. The core element of this theme is that individuals are accustomed to flooding and therefore are sufficiently resilient to be able to overcome this form of extreme weather. The supporting visual elements include foci upon (i) the cheerful demeanour of individuals who are affected by flooding; (ii) the protagonists' lack of victimhood; (iii) the protagonists' engagement in their day-to-day activities and (iv) the communal aspects of coping with flooding.

Accordingly, these images do not construct flooding as a matter of life and death but rather as an aspect of everyday life in these 'faraway' geographical contexts. There is no indication of victimhood or desperation, but rather a mundane sense of routine. Crucially, these images represent flooding as a distant phenomenon, with which viewers are not invited or necessarily encouraged to identify (Joffe, 2008). This means that for readers in the West such images may not symbolise, or indeed convey, compassion. Therefore, this visual construction of flooding, in particular, might not encourage reflection upon one's own environmental behaviour, and how this might contribute to climatic change and/or the apparent prevalence of extreme weather, unlike images of floods closer to home (Smith and Joffe, 2009, p. 653)

The results of the visual analysis do, however, attest to the emergence of a competing, visual theme cutting across various categories of extreme weather. This refers to the *visual theme of threat and danger from extreme weather*. The core element of this theme is that extreme weather poses some form of danger to nature and human life, which may or may not be stoppable. This visual representation of extreme weather is supported by visual elements showing that (i) 'we', that is, Westerners are less able to cope with extreme flooding; (ii) 'our' homes are susceptible to widespread damage as a result of flooding; (iii) human beings could disappear between the cracks of a dried-out earth; (iv) extreme heat is too unbearable for human life to sustain and (v) the planet and vulnerable islets are gradually being engulfed by hurricanes and rising sea levels. This essentially does bring extreme weather 'closer to us' (Smith and Joffe, 2009, p. 653), constructing it, in many respects, as 'alarming' (Risbey, 2008).

While Smith and Joffe (2009, p. 653) found that climate change can be constructed as 'closer to us' by representing its consequences in local settings, our analysis has found subtler ways of representing extreme weather as a threat to (and therefore fear for) one's immediate in-group by positioning it in familiar settings (such as architecture and modernity, which might not be seen as typical of developing countries). This visual representation may be thought of as dominant as it is coercive and, unlike the image of people 'getting on with it', it is not

confined to images depicting any particular form of extreme weather. Rather, images of various categories of extreme weather contribute to its formation and development (Abric, 2001).

There is a related *visual theme of premature ageing and deterioration of the earth*, which is clearly consistent with, and supportive of, the theme that extreme weather poses a threat. This emerging theme is supported by the visual elements showing that (i) the earth is being slowly engulfed by flooding and hurricanes; (ii) the earth is prematurely ageing due to a deathly lack of water; (iii) the landscape is barren and infertile; (iv) there is an absolute absence of human and animal life and (v) ice sheets are deteriorating. Here too relevant images may link extreme weather to the emotion of fear, since there is a constructed deterioration of the environment in which both nature and human beings reside, threatening our existence. Accordingly, this theme and the theme that extreme weather poses a threat and danger mutually complement one another in their collective depiction of the implications of extreme weather. In generating these themes, the images of extreme weather implicitly convey feelings of helplessness and vulnerability, given that premature ageing and deterioration are generally represented as being imminent and therefore resistant to human mitigation strategies.

In addition to the theme of threat/danger and premature ageing of the earth, the images make reference to the implicit causes of extreme weather by constructing a *visual theme of human-induced extreme weather*. The core of this theme is that man-made industrial activities have contributed to climatic change, resulting in extreme weather events. Visual elements highlighting this theme are that (i) automobiles are the cause of extreme heat; (ii) modern high-rise buildings, industrial buildings and power lines and (iii) modernity and nature intersect in a post-hurricane environment. This in turn may link these images to emotions of guilt and blame.

However, this incipient theme concerning human agency in extreme weather is challenged in some images of melting ice and rising sea levels, which implicitly attribute extreme weather to natural processes (Castell, 2010). More specifically, nature is represented as harming nature. This may convey emotions of guilt and result in attributions of blame. Images that fall within this theme clearly inculcate human beings and their activities as the underlying cause of extreme weather. Thus, unlike the guilt-inducing visual representation of people in developing countries 'getting on with it', the representation of human-induced extreme weather implicitly encourages individuals to reflect upon their role in causing extreme weather, which is visibly causing suffering in both 'faraway' lands and more locally.

## Conclusion

Hansen and Machin (2009) distinguished between symbolic or iconic and geographically and socially distinctive images. Lester and Cottle (2009), in turn, distinguished between human and natural impact images. While we found some

elements of these distinctions in the images we studied, overall our corpus of images does not neatly map onto either of these dichotomies. The images represent human suffering and loss and they are sometimes geographically and socially distinctive. And yet, they are also iconic of climate change and they are symbols of its natural impacts.

The images discussed here are images documenting real extreme weather events, such as floods in Pakistan or droughts in Texas. However, they are also symbols that express certain socially relevant emotions and tell a social story about weather, climate and human reactions to extreme events. Although some images can be seen as symbols of resilience in one context, far away from the reader of the image, they switch to symbols of vulnerability for the reader of Western newspapers in which they are used.

Most of the images studied may have largely negative emotional meanings and might therefore not be conducive to engagement with the implicitly constructed antecedent of extreme weather, namely climate change. In her discussion of the embodiment of emotion in visual material, Joffe (2008, p. 85) points out that ‘not only fear but also engagement and concern can be stirred by visuals’. Most images we studied had emotional meanings of fear, helplessness and vulnerability and, in some cases, guilt and compassion. These are what one may call passive rather than active emotions linked to engagement and responsibility. Even the images depicting people ‘getting on with it’ portray people as very distant from those who see the images in Western newspapers. This has important implications for climate change communication, where researchers such Moser and Dilling (2007, p. 11) have demonstrated that appealing to fear of disaster can lead to denial and paralysis rather than positive behaviour change.

Extreme weather images are, it seems, mainly symbols of threat, fear and vulnerability, which is consistent with established iconographies of climate change (Manzo, 2009). Fear, guilt, helplessness and defencelessness and other negative emotional experiences are unlikely to have favourable outcomes for one’s sense of self and may, counterproductively, induce deflection strategies such as those outlined above (Jaspal *et al.*, forthcoming).

While climate change communicators increasingly try ‘to avoid acknowledging disturbing information about climate change in order to “avoid emotions of fear, guilt, and helplessness”’ (Norgaard, 2011, quoted in Nisbet, 2013, p. 5), the images that are used to accompany even relatively matter of fact reporting on an IPCC report on extreme weather and climate change seem to convey just these emotions, and may subtly undermine these avoidance efforts.

### **Acknowledgements**

We would like to thank Alan Valdez for his assistance in extracting images from Google News. We are grateful to the ESRC for their financial support of project RES-360-25-0068.

## Notes

- <sup>1</sup>See <http://www.scientificamerican.com/article.cfm?id=noaa-makes-2011-most-extreme-weather-year>.
- <sup>2</sup>IPCC expected to confirm link between climate change and extreme weather, *The Guardian*, November 17.
- <sup>3</sup>UN-back report spotlights links between global warming and extreme weather, *UN News Centre*, November 18.
- <sup>4</sup>Report: Climate change worsens extreme weather events, *USA TODAY*, November 18.
- <sup>5</sup>Few nations doing enough to protect people from extreme weather-IPCC author, *AlertNet*, November 18.
- <sup>6</sup>Europe looks to 'coalition of the willing' for Durban deal, *EurActiv.com*, November 14.
- <sup>7</sup>Climate vulnerable countries seek reparation from rich nations, *Aid Netherlands*, November 15.
- <sup>8</sup>Vietnam joins declaration to continue climate change adaptation, *Thanh Nien*, November 18.
- <sup>9</sup>Mixed messages on climate 'vulnerability', *BBC News*, November 13.
- <sup>10</sup>Extreme weather takes growing toll, *CBC News*, November 18.
- <sup>11</sup>More extreme weather predicted, *Irish Times*, November 18.
- <sup>12</sup>Extreme weather will strike as climate change takes hold, IPCC warns, *The Guardian*, November 18.
- <sup>13</sup>Extreme weather: We are gambling with lives at ever worsening odds, *The Guardian*, November 18.
- <sup>14</sup>Are you concerned about extreme weather events?, *CBC News*, November 18.
- <sup>15</sup>Chat with USA TODAY Reporters about climate change on Friday, *USA TODAY*, November 18.
- <sup>16</sup>Heatwaves more likely due to climate change warns IPCC, *The Telegraph*, November 18.
- <sup>17</sup>World Bank: Much at stake at climate conference, *Voice of America*, November 17.
- <sup>18</sup>Weather disasters to increase report warns, climate change signal slow to emerge for some extremes, *The Washington Post*, November 18.
- <sup>19</sup>Climate panel says prepare for weird weather, *Nature*, November 18; 'IPCC Report: We are positioning our weather', *ThinkProgress*, November 18.
- <sup>20</sup>Warmer weather highlights NZ's vulnerability, *TV NZ*, November 19.
- <sup>21</sup>IPCC report warns risks from extreme weather events to increase, *ClickGreen*, November 18.
- <sup>22</sup>Global climate change risk rising: More heat, floods, extreme weather, *Environment News Service*, November 18.
- <sup>23</sup>Drier, hotter: Can Egypt escape its climate future? *The Guardian*, November 18.
- <sup>24</sup>IPCC: Climate impact risk set to increase, *Tehran Times*, November 19.
- <sup>25</sup>Climate change not the only culprit in extreme weather: UN panel, *The Spec*, November 18.
- <sup>26</sup>Commissioners urge climate-change action, *New Europe Online*, November 18.
- <sup>27</sup>Climate conference warns of extremes, *UPI.com*, November 18.
- <sup>28</sup>IPCC Report: Global Warming—and Changing Population—Will Worsen the Toll of Extreme Weather, *Time Magazine*, November 18.

## References

- Abric, J-C (2001) A structural approach to social representations, in: K. Deaux and G. Philogène (Eds) *Representations of the Social: Bridging Theoretical Traditions*, pp. 42–47. (Oxford: Blackwell)
- Banks, M. (2008) *Using Visual Data in Qualitative Research* (London: Sage).
- Beattie, G. and McGuire, L. (2012) See no evil? Only implicit attitudes predict unconscious eye movements towards images of climate change, *Semiotica*, 2012(192), pp. 315–339.

- Boykoff, M. (2007) Flogging a dead norm? Media coverage of anthropogenic climate change in United States and United Kingdom, 2003–2006, *Area*, 39(4), pp. 470–481.
- Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology, *Qualitative Research in Psychology*, 3(2), pp. 77–101.
- Brönnimann, S. (2002) Picturing climate change, *Climate Research*, 22(87–95), pp. 87–95.
- Brulle, R. J., Carmichael, J. and Jenkins, J. C. (2012) Shifting public opinion on climate change: An empirical assessment of factors influencing concern over climate change in the U.S., 2002–2010, *Climatic Change*, 114(2), pp. 169–188.
- Burke, E. ([1757] 1998) *A Philosophical Enquiry into the Sublime and Beautiful and Other Pre-revolutionary Writings* (London: Penguin).
- Carvalho, A. and Burgess, J. (2005) Cultural circuits of climate change in U.K. broadsheet newspapers, 1985–2003, *Risk Analysis*, 25(6), pp. 1457–1469.
- Castell, S. (2010) *What the Public Say about Climate Change and Low Carbon Interventions* (London: Department for Business Innovation and Skills).
- Cohen, S. (2001) *States of Denial* (Cambridge: Polity).
- Corfee-Morlot, J., Maslin, M. A. and Burgess, J. (2007) Climate science in the public sphere, *Philosophical Transactions A of the Royal Society*, 365(1860), pp. 2741–2776, 2084.
- Domke, D., Perlmutter, D. and Spratt, M. (2002) ‘The primes of our times? An examination of the “power” of visual images’, *Journalism*, 3(2), pp. 131–159.
- Doyle, J. (2007) Picturing the clima(c)tic: Greenpeace and the representational politics of climate change communication, *Science as Culture*, 16(2), pp. 129–115.
- Doyle, J. (2011) *Mediating Climate Change* (Aldershot: Ashgate).
- Doyle, A. (2012) Climate change, extreme weather link becoming more apparent, *Huffington Post*. Available at [http://www.huffingtonpost.com/2012/07/27/climate-change-extreme-weather\\_n\\_1709603.html](http://www.huffingtonpost.com/2012/07/27/climate-change-extreme-weather_n_1709603.html) (accessed 1 August 2013).
- Drajem, M. (2012) Record heat wave pushes U.S. belief in climate change to 70%, *Bloomberg News*. Available at <http://www.bloomberg.com/news/2012-07-18/record-heat-wave-pushes-u-s-belief-in-climate-change-up-to-70-.html> (accessed 1 August 2013).
- Elliott, R., Fischer, C. T. and Rennie, D. L. (1999) Evolving guidelines for publication of qualitative research studies in psychology and related fields, *British Journal of Clinical Psychology*, 38(3), pp. 215–229.
- Erdmann, K. O. (1896) Vorstellungswert und Gefühlswert der Worte, *Beilage zur Allgemeinen Zeitung*, 223 (Supplement to the *Allgemeine Zeitung*).
- Fischer, D. (2013) Stories linking climate change to sea-rise, weird weather and other events showed an all-time high, *Daily Climate*, January 3. Available at <http://www.dailyclimate.org/tdc-newsroom/2013/01/2012-climate-change-reporting> (accessed 1 August 2013).
- Geertz, C. (1973) *The Interpretation of Cultures* (New York: Basic Books).
- Gillis, J. (2012) Global warming makes heat waves more likely, study finds, *New York Times*, July 10. Available at <http://www.nytimes.com/2012/07/11/science/earth/global-warming-makes-heat-waves-more-likely-study-finds.html> (accessed 1 August 2013).
- Hansen, A. and Machin, D. (2009) Visually branding the environment: Climate change as a marketing opportunity, *Discourse Studies*, 10(6), pp. 777–794.
- Harvey, F. (2012) Scientists attribute extreme weather to man-made climate change, *The Guardian*, July 10. Available at <http://www.guardian.co.uk/environment/2012/jul/10/extreme-weather-manmade-climate-change> (accessed 1 August 2013).
- Hewstone, M. and Augoustinos, M. (1998) Social attributions and social representations, in: U. Flick (Ed.) *The Psychology of the Social*, pp. 60–76 (Cambridge: Cambridge University Press).
- Höijer, B. (2010) Emotional anchoring and objectification in the media reporting on climate change, *Public Understanding of Science*, 19(6), pp. 717–731.

- IPCC (2011) *Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX)*, Intergovernmental Panel on Climate Change. Available at <http://ipcc-wg2.gov/SREX/> (accessed 1 August 2013).
- Iyer, A. and Oldmeadow, J. (2006) Picture this: Emotional and political responses to photographs of the Kenneth Bigley kidnapping, *European Journal of Social Psychology*, 36(5), pp. 645–637.
- Jaspal, R. and Nerlich, B. (forthcoming) When climate science became climate politics: British media representations of climate change in 1988. *Public Understanding of Science* (Online first: doi: 10.1177/0963662512440219).
- Jaspal, R., Nerlich, B. and Cinnirella, M. (forthcoming) Human responses to climate change: Social representation, identity and socio-psychological action, *Environmental Communication: A Journal of Nature and Culture*.
- Joffe, H. (2008) The power of visual material: Persuasion, emotion and identification, *Diogenes*, 55(1), pp. 84–93.
- Kitzinger, J. (1995) The Face of AIDS, in: I. Marková and R. Farr (Eds) *Representations of Health, Illness and Handicap*, pp. 49–66 (Amsterdam: Harewood Academic Publishers).
- Kolbert, E. (2012) The big heat, *The New Yorker*, July 23. Available at [http://www.newyorker.com/talk/comment/2012/07/23/120723taco\\_talk\\_kolbert](http://www.newyorker.com/talk/comment/2012/07/23/120723taco_talk_kolbert) (accessed 1 August 2013).
- Konstantinidou, M. (1997) *Sprache und Gefühl.: Semiotische und andere Aspekte einer Relation* (Hamburg: Buske).
- Lester, L. and Cottle, S. (2009) Visualizing climate change: Television news and ecological citizenship, *International Journal of Communication*, 3, pp. 920–936.
- Linder, S. H. (2006) Cashing-in on risk claims: On the for-profit inversion of signifiers for “global warming”, *Social Semiotics*, 16(1), pp. 103–132.
- Manzo, K. (2009) Imaging vulnerability: The iconography of climate change, *Area*, 42(1), pp. 96–107.
- Marshall, M. (2012) Climate change boosted odds of Texas drought, *New Scientist*, July 10. Available at <http://www.newscientist.com/article/dn22037-climate-change-boosted-odds-of-texas-drought.html> (accessed 1 August 2013).
- Moscovici, S. (1988) Notes towards a description of social representations, *European Journal of Social Psychology*, 18(3), pp. 211–250.
- Moscovici, S. and Hewstone, M. (1983) Social representations: From the ‘naïve’ to the ‘amateur’ scientist, in: M. Hewstone (Ed.) *Attribution Theory: Social and Functional Extensions* (Oxford: Basil Blackwell).
- Moser, S. C. and Dilling, L. (2007) Introduction, in: S. C. Moser and L. Dilling (Eds) *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*, pp. 1–30 (Cambridge: Cambridge University Press).
- Nicholson-Cole, S. A. (2005) Representing climate change futures: A critique of the use of images for visual communication, *Computers, Environment and Urban Systems*, 29, pp. 255–273.
- Nisbet, M. (2013) *Nature’s Prophet: Bill McKibben as Journalist, Public Intellectual and Activist*. Harvard Kennedy School: Joan Shorenstein Center on the Press, Politics and Public Policy. Discussion Paper Series #D-78: Available at <http://shorensteincenter.org/wp-content/uploads/2013/03/D-78-Nisbet1.pdf> (accessed 1 September, 2013).
- NOAA. (2011) *National Oceanic and Atmospheric Administration: Extreme Weather 2011; a Year for the Record Books*. Available at <http://www.noaa.gov/extreme2011/> (accessed 1 August 2013).
- Norgaard, K. (2011) Climate denial: Emotion, psychology, culture, and political economy, in J. S. Dryzek, R. B. Norgaard and D. Schlosberg (Eds) *The Oxford Handbook of Climate Change and Society*, pp. 399–413 (Oxford: Oxford University Press).
- O’Neill, S. and Hulme, M. (2009) An iconic approach for representing climate change, *Global Environmental Change*, 19(4), pp. 402–410.

- O'Neill, S. and Nicholson-Cole, S. (2009) "Fear won't do it": Promoting positive engagement with climate change through visual and iconic representations, *Science Communication*, 30(3), pp. 355–379.
- Palutikof, J. P., Agnew, M. D. and Hoar, M. R. (2004) Public perceptions of unusually warm weather in the UK: Impacts, responses and adaptations, *Climate Research*, 26(1), pp. 43–59.
- Pantti, M., Wahl-Jorgensen, K. and Cottle, S. (2012) *Disasters and the Media* (New York: Peter Lang).
- Peterson, T. C., Stott, P. A., and Herring, S. (Eds) (2012) Explaining extreme weather events of 2011 from a climate perspective, *American Meteorological Society*, July issue, Introduction, pp. 1041–1067. Available at <http://www1.ncdc.noaa.gov/pub/data/cmb/bams-sotc/2011-peterson-et-al.pdf> (accessed 1 August 2013).
- Poole, R. (2008) *Earthrise: How Man First Saw the Earth* (New Haven, CT: Yale University Press).
- Risbey, J. (2008) The new climate discourse: Alarmist or alarming? *Global Environmental Change*, 18(1), pp. 26–37.
- Rose, G. (2001) *Visual Methodologies: An Introduction to the Interpretation of Visual Materials* (London: Sage).
- Rosenthal, J. (2010) The secret history of climate alarmism, *The Weekly Standard*, August 9, 15(44). Available at <http://m.weeklystandard.com/articles/secret-history-climate-alarmism>. (accessed 1 August 2013).
- Smith, N. and Joffe, H. (2009) Climate change in the British press: The role of the visual, *Journal of Risk Research*, 12(5), pp. 647–663.
- Turner, V. (1967) *The Forest of Symbols: Aspects of Ndembu Ritual* (Ithaca, NY: Cornell University Press).
- Von Storch, H. and Krauss, W. (2005) *Culture Contributes to Perceptions of Climate Change*, *Nieman Reports* 59(4): 99–102. Available at <http://www.nieman.harvard.edu/reports/article/100600/Culture-Contributes-to-Perceptions-of-Climate-Change.aspx>. (accessed 1 August 2013).
- Ward, R. E. T. (2009) Climate change, the public and the media in the UK: A watershed moment, in: T. Boyce and J. Lewis (Eds) *Climate Change and the Media*, pp. 59–64 (New York: Peter Lang).
- Zajonc, R. B. (1998) Emotions, in: D. Gilbert, S. D. Fiske and G. Lindzey (Eds) *Handbook of Social Psychology*, Vol. 1, pp. 591–632. (New York: Oxford University Press).