

From climate science to climate politics: British media representations of climate change in 1988

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Climate change has become a pressing environmental concern for scientists, social commentators and politicians. Previous social sciences research has explored media representations of climate change in various temporal and geographical contexts. Through the lens of Social Representations Theory, this article provides a detailed qualitative thematic analysis of media representations of climate change in the 1988 British broadsheet Press, given that this year constitutes an important juncture in this transition of climate change from the domain of science to that of the socio-political sphere. The following themes are outlined: (i) 'Climate change: a multi-faceted threat'; (ii) 'Collectivisation of threat'; (iii) 'Climate change and the attribution of blame'; and (iv) 'Speculative solutions to a complex socio-environmental problem'. The article provides detailed empirical insights into the 'starting-point' for present-day disputes concerning climate change and lays the theoretical foundations for tracking the continuities and discontinuities characterising social representations of climate change in the future.

Keywords: climate change; media; communication; social representations; qualitative; social psychology

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On the basis of time reconstructions of mean temperatures in the Northern Hemisphere, research in the field of climate science has convincingly demonstrated that the past century has been the warmest since the 1400s (Mann, Bradley & Hughes, 1998). Moreover, there is a degree of consensus among climate scientists that a changing climate will have negative and potentially irreversible consequences for the environment, wildlife and human beings (Crowley, 2000; Karl & Trenberth, 2003; IPCC report 2007; Royal Society, 2010). Climate change has therefore become an increasingly pressing concern for scientists, social and political commentators and politicians alike. For several decades, those concerned with human, animal and environmental welfare have debated how to deal with climate change politically, socially and economically; to such an extent that in 2009 Mike Hulme could claim that climate change ‘has more potency now as a mobilising idea than it does as a physical phenomenon’ (Hulme, 2009: 328).

This article will focus on one important juncture in this transition of climate change from the domain of science to that of the socio-political sphere. Through the interpretive lens of social representations theory, it provides a detailed qualitative analysis of media representations in the British broadsheet Press in 1988, the year in which climate change entered the socio-political arena in Britain in a major way (Hulme, 2009).

Why 1988?

The earth's climate has been a scientific issue for over two hundred years (Fleming, 1998). However, it only became a socio-political issue about three decades ago, with the year 1988 constituting a particular juncture in this historical trajectory (Hulme, 2009). In this transition, framing the climate as something potentially dangerous was important (Parry, Carter & Hulme, 1996). The first mention of ‘danger’ and ‘calamity’ in relation to climate change seems to be from the 1963 proceedings of a conference in New York of the Conservation Foundation (see Waert, 2006). In 1970, a book in the futurology genre (Taylor, 1970) painted a doom-laden and apocalyptic image of the effects of climate change. A year later, in 1971 a report was published entitled ‘Man’s Impact on Climate’. It was subsequently mentioned in Kellogg’s (1987) seminal article “Mankind’s Impact on Climate: The Evolution of an Awareness”, which was published in *Climatic Change*. 1986 saw the publication, in Germany, of a special issue of *Der Spiegel* devoted to ‘climate catastrophe’, illustrated on its front page by the iconic Cologne Cathedral being semi-submerged by rising flood waters. The same year Ulrich Beck published his seminal book on the ‘risk society’ (Beck, 1992 [1986]), which brought the global aspects of environmental risk to the attention of the social and political elite. And, as Mazur (1998) has shown “[i]mportant hazards to the global environment, including climate change, ozone depletion, rainforest destruction and species extinction, were prominently covered by the American mass media during the period 1987-90.” 1988 can therefore be seen as a crest of a wave of social, political and media recognition of climate change as a global problem in need of global solutions.

In 1988 the *Intergovernmental Panel on Climate Change* was established (Hulme, 2008) and held its first event in Geneva. In the US context, that year NASA scientist Jim Hansen famously declared that he was ‘99 per cent certain’ that climate change was attributable to human activities, adding that it was ‘time to stop waffling so much and say that

the evidence is pretty strong that the greenhouse effect is here' (see Hulme, 2009). Key political figures from the US (President George Bush and Governor Michael Dukakis), the Soviet Union (President Mikhail Gorbachev) and the UK (Prime Minister Margaret Thatcher) all publicly attributed importance to addressing the climate change problem. In addition to these political developments, the summer of 1988 was one characterised by extreme heat and drought in North America, which, in public consciousness at least, served to 'prove' that the climate was indeed changing. Ungar (1992: 490) points out that 'what rendered 1988 so extraordinary was concatenating physical impacts felt by the person in the street'. Thus, 'personal experience' of climate change, coupled with media attention is thought to have played an important role in climate change's rise in the socio-political domain that year. Moreover, Boykoff (2008, 2009) has provided quantitative data on newspaper coverage of climate change over three decades, which clearly exhibit a steep rise in media reporting in 1988.

Climate change in the media

The media constitutes an important source of societal information regarding a wide range of social issues, including scientific issues such as climate change (Cabecinhas, Lazaro & Carvalho, 2008). In fact, climate change has been described as one of the most politicised scientific issues attracting abundant media coverage (Deming, 2005). Accordingly, the media has the ability to shape public understanding of climate change. Thus, in many respects, media engagement with climate change in 1988 would have set the tone for political and public engagement for some time to come.

There has been some important and insightful work on media representations of climate change in a variety of national and temporal contexts. However, these media analyses have typically covered large time frames. For instance, Boykoff and Mansfield (2008) examine the content of articles from 2000 to 2006, while Carvalho and Pereira (2008) focus upon 'critical moments' between 2003 and 2007. There has been no detailed analysis of the 1988 broadsheet Press. Although Carvalho and Burgess (2005) discuss tendencies in media reporting between 1985 and 1990, there is no systematic focus upon the representational strategies nor the potential outcomes for public understanding of reporting in this seminal year. One aim of the present paper is to examine how media representations of climate change in a particular temporal context have contributed to the conceptual backdrop against which public understanding of climate change has developed.

In her critical discourse analysis of Swedish media representations of climate change, Olausson (2009:425) demonstrated the 'discursive construction of global climate change as a social problem', which requires either *mitigation* or *adaptation*. These forms of social action are described as frames of social action, which are encouraged by the media. Given that these frames of social action are reproduced in a national context in which there are almost consensual views on the need to act against climate change (Carragee & Roefs, 2004; Olausson, 2009), they do not necessarily require elaboration, reiteration and defence against alternative frames calling for inaction. By contrast, the British context is characterised by a 'framing contest' (Anderson, 1997), consisting of diverging frames of social and political action (Carvalho & Burgess, 2005). In this article we focus on the British context and we bring fresh theoretical insights from social psychology to bear on the question as to how and in what conceptual form climate change entered the social and political arena in 1988.

Social representations theory

Social sciences approaches are usually concerned with understanding how climate change is represented, on the one hand, and how people think and feel about it, on the other. Theoretically, an understanding of the relationship between these two levels may be key to

facilitating positive social change. Social representations theory (SRT) was designed to address this relationship, by treating seriously the information that circulates in society and the ideas in people's minds. A social representation is defined as 'a system of values, ideas and practices' regarding a given social object (Moscovici, 1973: xiii), as well as 'the elaborating of a social object by the community for the purpose of behaving and communicating' (Moscovici, 1963: 251). Accordingly, a social representation provides a given group with a shared social 'reality' and 'common consciousness' of a particular social object. As observed in the work of Olausson (2009) in the Swedish context, the shared social reality in relation to climate change is that it exists and must be dealt with.

The primary function of a social representation is to allow 'something unfamiliar and troubling, which incites our curiosity to be incorporated into our own network of categories and allows us to compare it with what we consider a typical member of this category' (Moscovici, 1981: 193). Thus, social representations of climate change facilitate meaning-making of this potentially obscure and esoteric environmental phenomenon originating from the scientific domain. *Hegemonic* social representations are shared consensually by members of a group; they are coercive and uniform. *Polemic* representations are generated in the course of social conflict and are characterised by antagonistic relations between groups.

Moscovici (1988) outlines two socio-psychological processes in the formation of representations, namely *anchoring* and *objectification*. Anchoring reflects the categorisation of unfamiliar objects through their comparison with an existing stock of familiar and culturally accessible objects (Moscovici, 1988). For a community to develop an understanding of a complex scientific phenomenon such as climate change, it must first be named and attributed familiar characteristics, which facilitate communication and discussion about it. For instance, in both survey-based and qualitative interview research it has been found that members of the general public in Britain and the US tend to anchor the relatively unfamiliar concept of climate change to existing knowledge of ozone depletion (Leiserowitz, 2006; Whitmarsh, 2005, 2009). This in turn can mean that ozone depletion and climate change are perceived by laypeople as having similar causes and solutions (Kempton et al., 1995).

Objectification is the process whereby unfamiliar and abstract objects are transformed into concrete and 'objective' common-sense realities. Moscovici and Hewstone (1983) postulate three sub-processes associated with objectification, namely *personification of knowledge*, *figuration* and *ontologisation*. Personification of knowledge links the abstract object to a person or a group, providing the object with a more concrete existence through this association. Figuration refers to the process whereby an abstract object is dominated by metaphorical imagery, which renders it more psychologically and culturally accessible. Ontologisation refers to the process whereby physical characteristics are attributed to a non-physical, essentially 'materialising' the immaterial.

Abric (2001) has outlined the structure of social representations, consisting of a *core* and *peripheral* elements. The central or structuring 'core' of the social representation attributes meaning and value to its other elements and determines the nature of the links between these elements. The 'core' unifies the representation and is thus its most stable element in moving and evolving contexts, while peripheral elements are organised around the core, and provide it with context. They serve to 'concretise', adapt and defend the central core, rendering it intelligible and transmissible. New incoming information can be incorporated into the representation in the form of peripheral elements, which highlights their volatility, versatility and mutability. Previous media analyses in the Swedish context have drawn upon SRT (e.g. Höijer, 2010), but this work has not examined the structural elements of social representations of climate change. This paper, by contrast, provides insight into the structure of emerging social representations of climate change in the 1988 British broadsheet

Press, by differentiating the ‘core’ and peripheral elements of these representations and exploring their interactions in a volatile social context or ‘battlefield of knowledge’ that is the Press.

Crucially, in order for an object to form part of a community and group’s social reality, it needs to be *socially represented*. This highlights the need for fine-grained qualitative analyses of the media’s social representations of climate change with a focus on the emergence of social representations (Voelklein & Howarth, 2005).

Aims of study

The aim of the present paper is to investigate how social representations of climate change have been created in the 1988 British broadsheet Press. More specifically, it examines representations of *what* climate change is, *whom* it affects and *how* one ought to respond to it, all issues that are still being discussed today.

METHOD

Qualitative thematic analysis

The qualitative data are analysed using a social constructionist variant of qualitative thematic analysis, which has been described as ‘a method for identifying, analysing and reporting patterns (themes) within data’ (Braun & Clarke, 2006: 78). Thematic analysis is a qualitative method for the identification, analysis and reporting of patterns of meaning within a data set. These patterns of meaning are represented as ‘themes’. The constructionist variant of the technique can be employed to ‘unpick or unravel the surface of ‘reality’’ (Braun & Clarke, 2006: 81). Here the method is employed in order to identify social representations of climate change and their respective peripheral elements. While the methodological usefulness of alternative methodological frameworks is readily acknowledged, such as van Dijk’s (1993) socio-cognitive approach to the thematic structure of news, the present study positions itself within a growing body of research which synthesises thematic analysis and SRT (e.g. Jaspal, 2011; Pearce & Stockdale, 2010).

Thematic analysis was considered particularly useful since it allows the researcher to engage with theory, in this case SRT, in a quasi-deductive fashion in order to add theoretical depth to the data analysis (see Hayes, 1997). ‘Theoretical’ thematic analysis allows the researcher to engage with theory in the analysis, thereby going beyond mere description and providing scope for theory development. Its primary use here is to identify principal social representations disseminated by the broadsheet press, although there is a theoretical interest in how the ‘core’ of a social representation relates to its ‘peripheral’ elements in contexts of political contestation (Vala et al., 1998). To complement the many existing empirical studies of climate change communication, which describe the patterns of representations observable in the Press, the present paper provides an in-depth analysis of the early and emergent *components* of social representations of climate change.

Data collection and procedure

The present study focuses upon social representations of climate change, disseminated in the 1988 British broadsheets. Although the tabloid Press now regards climate change as newsworthy (Boykoff, 2008), in 1988 this socio-environmental concern was largely the domain of the broadsheets (Carvalho & Burgess, 2005). The sample includes articles from *The Times*, *The Guardian*, *The Daily Telegraph* and *The Independent*, as well as their Sunday editions. *The Times* acquired a right-of-centre political leaning subsequent to its acquisition by Rupert Murdoch’s News International in the 1980s and has traditionally been more sceptical regarding climate change. Conversely, *The Guardian* has a left-of-centre political

orientation and has largely been supportive of mainstream scientific consensus concerning climate change. Using LexisNexis, we conducted a search of British broadsheet newspaper articles published between 1st January 1988 and 31st December 1988 in order to track the broadsheet newspapers' dissemination of social representations of climate change in that year. The keywords 'global warming' and 'climate change' were employed in the search. Thus, articles which make any mention of one or both of these terms were included in the results. The search initially identified 181 newspaper articles. All articles were pre-screened by the authors in order to identify theoretically insightful articles and to exclude from the sample those articles which made only passing reference to climate change. 63 articles were subsequently selected for in-depth qualitative thematic analysis.

The selected articles were read repeatedly. The right margin was used to note emerging theme titles which captured the essential qualities of the accounts. This procedure was repeated with every article. These initial codes included *inter alia* the general tone of the article, particular forms of language (e.g. metaphor), and emerging patterns within the data. Subsequently, the right margin was used to collate these initial codes into potential themes, which captured the essential qualities of the articles analysed. Codes were pieced together in order to create themes which addressed the original research questions. As highlighted by Braun and Clarke (2006, p. 82), 'a theme captures something important about the data in relation to the research question, and represents some level of *patterned* response or meaning within the data set.' Thus, the 'keyness' of the themes reported in the present study depended upon their importance in relation to the research questions outlined above. The themes were reviewed rigorously against the corpus of data in order to ensure their compatibility and numerous extracts from the articles were listed against each corresponding theme. It was at this stage that specific article extracts, which were considered vivid, compelling and representative of the themes, were selected for presentation in the final research report. Finally, four superordinate themes representing the themes derived from the analysis were developed and ordered into a logical and coherent narrative structure. Relevant constructs from SRT were drawn upon as a means of theoretically enriching the analysis.

In the extracts that are presented in the analysis section, three dots within square brackets indicate where material has been excised; other material within square brackets is clarificatory; bold font sentences indicate that the text constitutes a headline; and bold font words indicates theoretical 'keyness'. The sources of the extracts are presented as endnotes.

ANALYSIS

The most important themes disseminated by the British broadsheet Press in 1988, which describe the principal social representations that emerged that year, are entitled (i) 'Climate change: a multi-faceted threat'; (ii) 'Collectivisation of threat'; (iii) 'Climate change and the attribution of blame'; and (iv) 'Speculative solutions to a complex socio-environmental problem'. They will now be discussed in detail.

Climate change: a multi-faceted threat

The majority of the articles examined encouraged the social representation that the interconnected (and in themselves unthreatening) concepts 'global warming' and 'the greenhouse effect' constitute a multi-faceted threat to 'the World':

- (1) The **menace** of the greenhouse effectⁱ
- (2) The greenhouse effect [...] may raise the temperature of the globe over the next few decades, **with disastrous consequences**.ⁱ

- (3) The World should know in five to 20 years whether the 'greenhouse effect' is changing the climate in ways **that could spell disaster** next centuryⁱⁱ

These extracts exemplify a general tendency to construct 'the greenhouse effect' in terms of a threatening entity, in line with the emergent discourse around 'dangerous climate change'. The rhetorical association of the greenhouse effect with the term 'menace' contributes to the social representation of threat, since it indicates that the very essence of the greenhouse effect entails harm and danger. In extract 2, the nature of the threat is explicated through the provision of further information, namely that the temperature of the globe is likely to increase. Moreover, warming is said to entail 'disastrous consequences', anchoring the greenhouse effect to imagery of widespread destruction and catastrophe. Similarly, extract 3 reproduces the representation of threat through its anchoring of the 'greenhouse effect' to 'disaster' imagery. Rhetorically, these become inter-related phenomena. The process of anchoring establishes the social meanings of warming in terms of a disastrous phenomenon, rather than a positive one, for instance.

The threat of the greenhouse effect is positioned as temporally 'close' through the use of ambiguous temporal quantification: 'over the *next* few decades'. The rhetorical strategy of temporal 'closeness' establishes the temporal proximity of climate change as a peripheral element of the social representation of threat. This peripheral element is supportive of the core of the representation, since it constructs climate change in terms of an imminent, immediate and pressing threat. Accordingly, it serves to elaborate and accentuate the threat (Leiserowitz, 2005).

The following extract extends the link between climate change and disaster by focusing on the 'scale' of the threat, providing an additional peripheral element. In extract 4, this is encouraged through the juxtaposition of 'small [...] global warming' with the imagery of disaster and calamity. This serves to construct even 'small' changes as conducive to considerably more important *negative* outcomes.

- (4) An apparently **small** average global warming could have **dramatic effects** [...] The effects in warmer latitudes could be **calamitous**ⁱⁱⁱ

Moreover, anchoring provides an *evaluative* lens for understanding climate change, since 'warming' is constructed in unambiguously negative terms. This is a noteworthy difference from subsequent representations of global warming, in which the 'positive' implications for Britain (i.e. improved weather) have been developed as a competing social representation (Castell, 2010).

However, in 1988, the social representation of climate change as a multi-faceted threat seemed hegemonic in the British broadsheet Press (continuing the discourse of 'danger' that had emerged in the 1960s and 1970s). In addition to the strategy of anchoring climate change to imagery of danger and calamity, extract 5 anchored the notion of environmental change to more 'concrete' negative real-world consequences:

- (5) Should these [environmental] changes occur the next century would witness 'a potentially **dangerous** disequilibrium between soil, vegetation and climate [...] which cannot yet be predicted in detail.'^{iv}

The article begins by introducing 'Professor Kenneth Hare, chairman of the international advisory group on greenhouse gases' and subsequently presents the quote in extract 5. The rhetorical device of 'strategic quoting' is employed in order to reinforce the anchoring of change to imagery of danger and threat. This type of quoting 'consists of the presentation of a media agenda through quotes strategically selected from members of the groups discussed [in

this case, the chairman of an advisory group]’ (Jaspal, 2011: 254). This constitutes an effective means of establishing a social representation or, in the present case, a peripheral element of a representation. This is consistent with the assertion that figures in authority will likely have power in establishing a representation (Breakwell, 2001).

The social representation of a multi-faceted threat is developed through the establishment of various supporting peripheral elements, such as the ‘disequilibrium between soil, vegetation and climate’. In addition to the more abstract imagery of danger and calamity, extract 5 alludes to negative outcomes for food and agriculture as a result of climate change. The constructed consequences of climate change may be regarded primarily as supporting the overarching representation. Peripheral elements can become entrenched and unified through the rhetorical strategy of alliteration; the adjective ‘dangerous’ and the noun ‘disequilibrium’, collectively, activate imagery of danger, imbalance and chaos in relation to climate change. Consequently, these peripheral elements become rhetorically entwined and anchored to one another, reinforcing the overarching representation. Furthermore, the caveat that the ‘dangerous disequilibrium [...] cannot yet be predicted in detail’ performs the rhetorical function of establishing a peripheral element of uncertainty in relation to climate change. As observed earlier, this jeopardises the identity principle for meaning and certainty, potentially rendering the prospect of climate change more threatening at the socio-psychological level (Hogg, 2000).

The social representational strategy of anchoring is employed in order to explicate the potential consequences of inaction *vis-à-vis* the related environmental problem of the ozone layer hole. For instance, in extract 6, the threat of the ‘decline in the ozone layer’ is anchored to human health, which has the effect of constructing this environmental problem as a psychologically accessible and proximal one for individuals themselves:

- (6) The decline in the ozone layer could affect human immune systems, increase the incidence of skin cancers by up to 350,000 cases annually, and lead to more cataracts and blindness, scientists at the Changing Atmosphere conference in Toronto were warned yesterday.^v

Although this extract does not explicitly link the ozone layer hole to climate change, it is noteworthy that the issues of global warming and the decline in the ozone layer were heavily conflated in media and public discourse in the 1980s and 1990s, with the decline in the ozone layer being constructed as a causal factor in global warming (Hulme, 2009). In extract 6, the decline in the ozone layer is depicted as having a direct negative impact for ‘human immune systems’ and a *causal relationship* with ‘skin cancers’. More specifically, it is said to increase cases of skin cancers to ‘350,000 cases annually’. While the statistics provided in the newspaper article appear to be alarmingly high, rendering salient the social representation of threat, there is no indication of the baseline statistics of skin cancer. The omission of any baseline statistics makes this increase appear to be significant and excessive. These (and several other) constructed consequences of environmental change reflect multi-faceted threats to human health. It has been argued that individuals are more concerned about issues pertinent to their immediate ingroups, given that such issues have implications for the self (Cohen, 2001). Consistent with this thesis, the rhetorical salience of the superordinate category ‘human’ in relation to health problems renders it a relevant one for the readership regardless of specific (e.g. national, geopolitical) group membership.

The multi-faceted nature of the threat ensues from the representation of multi-faceted *consequences* of climate change. The extracts collectively encourage the social representation of multi-faceted threat by establishing, and imbuing the overarching representation with, supporting peripheral elements. These include (i) the jeopardy of food and agriculture; (ii) serious health problems; (iii) uncertainty. Accordingly, extract 7 unites the multitude of

threats, represented by the peripheral elements, which contribute to the over-arching social representation of climate change as a multi-faceted threat:

- (7) Even so, a rise in sea level of a metre [as a result of climate change] will cause suffering, loss of life and severe economic damage in the deltas of the Nile, the Ganges, the Mekong, the Yangtse and the Mississippi. The Maldives will disappear. So will a lot of other coral islands.^{vi}

Threats can be constructed as distant, both in temporal and geographical terms, which reduces their power in promoting behaviour change (Leiserowitz, 2005). There is much socio-psychological evidence that individuals tend to be more concerned about social events and phenomena that are pertinent to their immediate ingroups, than those associated with outgroups (Cohen, 2001). Moreover, although integrated threat theorists would consider the threats constructed in extract 7 as ‘realistic’ and seriously jeopardising the material and physical well-being of one’s ingroup (Stephan & Stephan, 2000), the threat is actually *disassociated* from the primary ingroup of the readership, given its geopolitical distance. Although this and similar representational tendencies have the potential for distancing the climate change problem from the readership, there was an observed ‘collectivisation’ of the climate change threat in the sample.

Collectivisation of threat

The social representation of climate change as a *collective* threat emerged in the sample as a competitor of the representation of climate change as a distant problem. For instance, extract 8 employed the superordinate category ‘the World’ in order to denote stakeholders in the climate debate:

- (8) The World should know in five to 20 years whether the 'greenhouse effect' is changing the climate in ways that could spell disaster next century^{vii}

Knowledge of the ‘greenhouse effect’ is depicted as vital for ‘the World’ as a whole, rather than subgroups (e.g, national or geopolitical entities), thereby rendering latent the immediate ingroups (i.e. national and geographical). Moreover, the *consequences* of ‘carbon dioxide’ emissions are described in relation to ‘the world’, rather than any particular subgroup:

- (9) Evidence is accumulating that carbon dioxide emissions from fossil fuels threaten **the world** with the so-called ‘Greenhouse Effect’, which could cause massive flooding and climax change by the middle of the next century.^{viii}

Geographical and political units of analysis can be important in the social representation of global phenomena and can be manipulated rhetorically in order to achieve particular socio-psychological effects, such as the salience of ingroup disadvantage *versus* outgroup advantage (Bourhis & Jaspal, 2011). In the present case, the accentuation of the ‘global’ unit of analysis serves the rhetorical function of collectivising the threat of climate change, which in turn provides a strong rationale for *collective, global* social action. Moreover, this implicitly constructs the inaction of any subgroups within the superordinate category as unreasonable, given the pervasive consequences for ‘us all’:

- (10) Environmental deterioration is a threat to **us all**; preventing it is an opportunity for the farsighted.^{viii}

The social representation of climate change as a collective problem is linked with the importance of ‘preventing it’, echoing the collective action frame of mitigation (Olausson,

2009). Crucially, those who seek to prevent it are depicted as ‘farsighted’ implying the naiveté of those who deny it. More generally, social representational linkage is established between climate change as a collective threat *and* the necessity of a collective response to the threat. Furthermore, in both extracts 10 and 11, there is an implicit problematisation of inaction:

(11) It is a warning. Whether or not it is related to global changes, it provides a small taste of the dislocations **society** will face with an increasing frequency if **we** fail to act.^{ix}

Here, use of the construct of ‘society’ and the collective first pronoun ‘we’ highlight the collective threat faced by ‘society’ as a whole, which can, nonetheless, be prevented provided that ‘we’ act collectively. Crucially, both the threat and the proposed solution are ‘collectivised’, which is consistent with the collective action frame of mitigation (Olausson, 2009).

(12) Louisiana's Senator Bennett Johnson put it more succinctly. '**We** only have one planet. If **we** screw it up **we** have no place to go.'^{ix}

(13) The Prime Minister last night warned that the well-being of **the earth's inhabitants** may be at risk from pollution.^x

Extracts 12 and 13 employ strategically quote a national figure of authority to reinforce the social representation of a collective and international threat calling for global action. This attenuation of national and geographical divisions is facilitated through reference to the ‘one planet’ inhabited by ‘us’. Moreover, the threat to the superordinate ingroup is accentuated through the warning that ‘we [will] have no place to go’. The extracts do not construct the threat of climate change as targeting any *particular* subgroup, but as having negative consequences for the globe. Given the representation of threat at the most superordinate level of human interdependence, namely humanity itself, the threat of climate change is rendered psychologically relevant to ‘us’. It is constructed as transgressing national and geographical boundaries.

Although the threat of climate change was generally ‘collectivised’, there was also a tendency to engage in blame attribution, particularly in representations of the ‘origins’ of climate change.

Climate change and the attribution of ‘blame’

Several articles in the sample exhibited the tendency to identify a ‘guilty’ party in relation to climate change. Indeed, individuals are motivated to enhance a sense of ‘meaning’ in order to cope successfully with major social and psychological events, such as the social representation that the climate is changing with potentially hazardous consequences (Taylor, 1983). The rhetorical strategy of blame attribution was pervasive in this sample of articles, although the precise ‘culprit’ varied. Thus, it is possible to identify distinct social representations of blame. In the following extract, blame is attributed directly to various gases:

(14) These gases [carbon monoxide, carbon dioxide, nitrous oxide and nitric oxide] are some of the **villains** in a number of serious pollution problems. Carbon dioxide and nitrous oxide in the stratosphere are causing the slow heating up of the planet's surface in the **notorious** greenhouse effect.^{xi}

The social representation being established here is that there is a non-human, ‘natural’ cause of the greenhouse effect (Leiserowitz, 2005). Although human beings may well be increasing

levels of these gases within the atmosphere, this is largely implicit in the article from which the extract is drawn, since rhetorically the gases themselves are afforded maximum agency. The ‘guilty’ gases are constructed in agentive terms as the direct cause for ‘a number of serious pollution problems’. Through the use of the figuration process of objectification, the gases are negatively personified as ‘villains’. The metaphor of ‘villains’ positions the gases within the semantic field of wickedness and malevolence. Thus, while the core of the social representation is that climate change has a non-human cause, the peripheral, supporting element of the representation concerns the agency of gases. The personification process of objectification contributes to the establishment of this peripheral element. The second sentence of the extract performs the rhetorical function of marrying this peripheral element with the scientific observation that the gases (which are now referred to by their systematic chemical compound names) are *causally* linked to the ‘greenhouse effect’. The result of this social representational linkage is that the gases are malevolent *because* they directly cause the ‘heating up of the planet’s surface’ resulting in the ‘notorious greenhouse effect’. Incidentally, use of the adjective ‘notorious’ to qualify ‘greenhouse effect’ further reinforces the (negative) figuration of the gases in terms of ‘villains’, given that both lexical items evoke connotations of disrepute and infamy. Crucially, the agency rhetorically afforded to the gases seems to obscure human agency in shaping the environment, positioning human beings as the innocent party. Positioning in this way distances the notion of blame from human beings (Davies & Harré, 1990; Joffe, 1999).

Consistent with the argument that human agency in shaping the environment may be attenuated in newspaper reporting, some articles encouraged the social representation by developing the peripheral element that cows, termites and ‘bugs’ were culpable:

- (15) The villain is natural gas. But it is not the methane from the huge North Sea and Saudi reserves: it is the more-than-usually natural gas from termites' stomachs and cows' intestines.^{xii}

Blame is shifted from villainous natural (man-made) gases and allocated to the ‘more-than-usually *natural* gas’ emitted by animals positioned as villains, clouding the fact that human agency (namely foot production) is responsible for the villainy of one group of these animals (see Douglas, 1992).

The social representation that climate change is attributable to non-humans and ‘natural’ causes is further reinforced through the implicit acknowledgement of the competing representation that climate change constitutes a human-induced phenomenon. The acknowledgement of ‘counter-arguments’ and competing social representations (e.g. ‘although it commonly believed that Y is true, in fact X is true’) may serve to strengthen the representation intended for dissemination and encouragement. Thus, acknowledgement of the social representation, which the report attempts to problematise and contest, can dispel allegations of misinformation and inaccuracy. Crucially, it is juxtaposed with the ‘new’ representation, which is supposed to replace the ‘old’ representation. The contestation of ‘old’ representation in favour of a new one is observable in the following extract:

- (16) The **blame** for this has been put primarily on industrial pollutants. California scientists now say that **cows** are also **guilty** [...] A cow produces about 250 grams of it a day and releases it into the atmosphere.^{xiii}

The representation of human agency in climate change is acknowledged, but the competing representation that climate change is ‘natural’ (‘cows are guilty’) is intended to challenge its hegemony. It acquires credibility through its association with ‘California scientists’. This distances the core element of climate change as a ‘natural’ environmental phenomenon from

the newspaper outlet itself, attributing it instead to ‘scientific experts’ (see Kieran, 1998 for more on media credibility). Use of the temporal adverb ‘now’ reiterates the point that the rhetorical aim is to *replace* the former representation with this new one. It is necessary to establish credibility in relation to the social representation in the first instance and then to elaborate it through provision of more specific supporting peripheral elements (Abric, 2001).

The guilt of bugs or bacteria is also given scientific credibility, as in the following extract:

- (17) To see if bugs explained the pollution from burnt soil the scientists passed acetylene into the soil. If the bacteria were there, the treatment would knock them out and stop the release of gas. And indeed the experiments showed that the nitrous oxide fumes stopped very shortly afterwards - clearly the bugs themselves made the gases.^{xiv}

The salience of the social representation concerning climate change as a ‘natural’ phenomenon or as part of the ‘natural’ order makes it seem inevitable and posits adaptation rather than mitigation as the only option.

The 1988 British broadsheet Press can be described in terms of a representational field, in which contrasting and competing social representations are reproduced and encouraged, providing scope for debate and discussion surrounding climate change (Rose et al., 1995). In contrast to the polemic social representation of non-human villains being responsible for climate change, the hegemonic representation of human agency in climate change was also observable:

- (18) In the most graphic words she has ever used on the issue, Mrs Margaret Thatcher said it was possible that modern technology had unwittingly triggered ‘a massive **experiment** with the system of the planet itself.’^{xv}

- (19) Flying ring to save us from ourselves; Plans to protect the Earth's ozone shield (Headline)^{xvi}

- (20) In the same way that we are experimenting with the North Sea (to see how much poison can be shoved into the patient before death sets in), so we are **experimenting** with the composition of the atmosphere.^{xvii}

- (21) The environment is full of uncertainties. It makes no sense to **test** it to destruction. While we wait for the doctor’s diagnosis, the patient may easily die.^{xviii}

These extracts converge in their reproduction of the social representation of human agency in inducing climate change, although each one develops and draws upon distinct peripheral elements in order to elaborate this agency. In extract 18, the Prime Minister is strategically quoted as identifying ‘modern technology’ as the culprit. Thus, human agency is invoked in the subtlest terms. In fact, ontologisation is employed to objectify human agency as ‘modern technology’. Although human agency is implicit in the extract, the immediate ‘culprit’ is this inanimate technology. The adverb ‘unwittingly’ minimises the potential for blame, since it reduces intentionality. Nonetheless, the peripheral element echoes the collective action frame of mitigation (Olausson, 2009), given that it is recognised as a technologically induced, rather than ‘natural’, phenomenon (Gervais, 1997).

Extracts 19 and 20 are more overt in their representation of human beings as the ‘culprits’. There is a rhetorical focus upon the alarming consequences for ‘Us’ as human beings (Risbey, 2008). It is argued that ‘our’ actions will ultimately lead to ‘our’ demise. The peripheral element of the representation is that ‘we’ are self-destructively ‘experimenting’ with ‘our’ Earth, which has some substantive overlap with the peripheral element developed in extract 18. In extract 20, the objectification process of figuration accentuates the severity of this self-destructiveness; human agency in inducing climate change is metaphorically

represented in terms of ‘shoving’ poison ‘into the patient before death sets in’. This metaphorical imagery serves to reiterate the peripheral element of the overarching representation that ‘we’ are self-destructively experimenting with the Earth in superlative terms. The Earth is positioned within the personified category of ‘patient’, while humankind is positioned within the authoritative category of ‘experimenter’. Extract 21 elaborates this through the invocation of death imagery in relation to the ‘patient’ metaphor. Similarly, Nerlich and Jaspal (2011) note the use of the ‘planet as patient’ metaphor in media representations of geoengineering. Clearly, the positioning of humankind in the authoritative category of ‘experimenter’ can serve to empower ‘us’ by accentuating ‘our’ agency and efficacy in mitigating what ‘we’ ourselves have accelerated. The attribution of blame identifies a ‘cause’ and can facilitate the development of a ‘speculative solution’. This is discussed next.

Speculative solutions to a complex socio-environmental problem

The sample of articles examined pervasively manifested the collective action frame of mitigation in the representation of potential solutions to the climate change problem. More specifically, *awareness* and *acceptance* were depicted as the key to solving or at least alleviating this complex socio-environmental problem, as exemplified in the following extracts:

(22) ‘British firms will have to become **more aware** of the way the world is going. Painting walls and planting shrubs is not enough’^{xix}

(23) **Pollution threat of scorched Earth: Nasa scientist urges ‘cut the waffle on danger of global doubt’** (32)^{xx}

Extract 22 juxtaposes awareness and action in its presentation of a speculative solution to the climate change problem. More specifically, action (‘painting walls and planting shrubs’) is constructed as being an insufficient means of mitigating climate change. The assumption is that action is not habitually accompanied by awareness, which is represented as the relatively more efficacious solution. Similarly, extract 23 problematises the pervasiveness of ‘global doubt’. Mitigation against doubt and denial of the ‘pollution threat’ and ‘scorched’ condition of the Earth is constructed as vital. These extracts attest to the emerging media recognition of doubt and denial in relation to climate change. Thus, the constructed necessity of awareness and mitigation against denial is employed as a means of supporting the social representation of climate change as a multi-faceted threat.

The presentation of awareness and recognition as a speculative solution to the climate change problem essentially problematises denial at the political level, which is constructed as inhibiting positive social change:

(24) **Stop waffling and act now to save the world**

Even when the piles of bodies are stacked in front of them, skilful politicians can witter on about ‘insufficient evidence [...] As the evidence mounts, those professional prevaricators will therefore seek to drown us in waves of pious rhetoric.’^{xxi}

(25) As far as most politicians are concerned, this is still one of ‘tomorrow’s problems’; the drought in the United States and the flooding in the Sudan are **simply ‘natural disasters’**.^{xxi}

Extract 24 presents ‘waffling’ and denial as counterproductive to collective action of mitigation (possibly referring to Hansen’s famous speech). The objectification strategy of figuration is employed in order to depict evidence concerning climate change metaphorically in terms of ‘piles of bodies stacked in front of them’. The metaphor of ‘being stacked up’

further objectifies the evidence of climate change as a threat, since this ‘evidence’ is constructed as tangible objects. The denial or rejection of this evidence is implicitly depicted as reckless, malicious and premeditated. Indeed, the ‘pile of bodies’ is metaphorically represented as being in full view of ‘skilful politicians’, which highlights the allegedly malevolent intentions of the political elite. Moreover, their *de facto* intention is depicted as evasion of the truth, rather than governance for the public good. Similarly, extract 25 critiques the slow political response to climate change and implicitly calls for greater awareness of the ‘reality’ of climate change, especially as being human-induced and political and not simply natural. Incidentally, this ‘reality’ is constructed through the anchoring of climate change to real-world environmental issues such as drought and flooding in two distinct national contexts. Anchoring in this way renders the phenomenon of climate change as psychologically tangible and accessible (Moscovici, 1988).

While these extracts are unanimously concerned with the collective action frame of mitigation by proposing awareness (through the problematisation of denial and doubt, particularly at the political level), the collective action frame of adaptation was also observable:

(26) In contrast to the doom-laden warnings of some scientists, the British experts believe it is possible to adapt to the climatic changes, if appropriate measures are taken now.^{xxii}

Extract 26 acknowledges the existence of climate change as an environmental problem, although the severity of the problem appears to be rhetorically attenuated. The extract problematises the ‘warnings of some scientists’ (probably Hansen), which are hyperbolically described as ‘doom-laden’. It appears that the social representation of climate change as a multi-faceted threat is implicitly challenged in order to facilitate and set into motion the collective action frame of adaptation.

DISCUSSION

This article identifies early social representations of climate change disseminated in 1988 British broadsheet coverage of climate change and outlines the key social representational strategies employed in order to construct particular versions of social reality. It found a clear focus upon representations of climate change as a threat, which is in line with previous emergent discourses around climate or environmental problems as dangers, risks or hazards. Going beyond previous media analyses, it explores the *structure* of these representations consisting of a ‘core’ and peripheral elements. This can shed light on how meaning is created, maintained and defended against competing elements in ‘the battlefield of knowledge’ (Boykoff, 2009).

The analysis reveals that the broadsheet Press encourages the social representation of climate change as a multi-faceted threat with various supporting peripheral elements (Boykoff, 2008). This structural approach sheds light on how threat representations are constructed and disseminated to the readership. Peripheral elements include imagery of disaster and calamity, uncertainty in relation to climate change, inevitable imbalance between agriculture and food production and the danger of serious health problems. The role of these peripheral elements is a supporting one, reinforcing the core of the social representation of climate change as a threat (Abric, 2001). The conceptual overlap between these peripheral elements transforms the threat into a multi-faceted one. It is multi-faceted, due to the prevalence of several peripheral elements, each of which constructs a distinct ‘kind’ of threat (i.e. to agriculture; health). The negative consequences encapsulated in the peripheral elements are ‘collectivised’ in broadsheet representations through the use of collective categories (e.g. ‘the World’) in discussing the stakeholders in the climate change problem.

The representations of collective threat implicitly activate the collective action frame of mitigation (Olausson, 2009). However, the relationship between these representations and the frame of mitigation is problematised by emergent competing representations. It is argued that the anchoring of climate change to environmental disasters (e.g. drought; flooding) in geographically distant locations (e.g. the Maldives) may serve to ‘distance’ the problem psychologically from the immediate geo-national ingroup and thereby make it less amenable to collective action, an issue that persists today (Leiserowitz, 2005). Overall, it seems that the alarmist character of some contemporary climate change communication is very much present in 1988 (Risbey, 2008). In fact, geopolitical and climatological circumstances of the day seemed to have accentuated alarmist social representations in 1988.

Jaspal and Cinnirella (2010) have argued that there may be some correspondence between the identity ‘needs’ of groups and individuals and the representational strategies of the Press. Indeed, the human need for meaning and the human tendency to engage in (external and internal) attribution in order to make sense of the ‘unfamiliar’ was observable in the corpus. The articles seemed to manifest two competing social representations concerning the ‘culprits’ of climate change. The hegemonic representation of human agency in inducing climate change was supported with peripheral elements, such as the metaphorical imagery of ‘experimentation with the Earth’ and the positioning of humans as ‘experimenter’ and of the Earth as ‘victim’ (see also Wagner, Elejabarrieta & Lahnsteiner, 1995). In contrast, the objectification of human agency in terms of ‘modern technology’ supports the core of the representation that human beings and their man-made technology were partly responsible for climate change. However, the element did appear to distance the notion of blame and intentionality from humankind, attenuating human agency somewhat. While a peripheral element does support the core of the social representation, it may reinforce the core to varying degrees and over time may even cause contestation of the representation itself. With the development of co-ordinated countermovements, which contest current climate science, over the last two decades, this process of contestation has possibly become more accessible and attractive to laypeople (McCright, 2007).

The analysis also highlighted the emergence of a competing polemic social representation of climate change as a ‘natural’, non-human-induced phenomenon, supported by peripheral elements emphasising the agency of gases, cows and bugs. This representation may be regarded as polemic because it is formed in the context of debate and dispute concerning the origins of climate change (Hulme, 2009). The present data suggest that the competing hegemonic representation may be acknowledged and rendered salient in order for it to be contested and ‘replaced’ with the polemic representation. Crucially, this representation corresponds to the collective action frame of adaptation, given the implicit impossibility of mitigating against a ‘natural’ phenomenon. This may connect with contemporary thinking regarding ‘interference’ with nature, which would be implicit in the frame of mitigation (Gervais, 1997).

It is easy to see how a polemic social representation, which conveniently minimises the need for personal and social change, would be attractive and readily accepted and assimilated by members of a society. This may be attributed to the well-established need for a sense of continuity in thought and action and the general aversion to large-scale change (Breakwell, 1986). However, various articles constructed knowledge and awareness as a paramount prerequisite for mitigation. The emphasis upon awareness and understanding as an important means of dealing with climate change is different from the need for ‘urgent actions’ observable in the European media in the 2000s (Dirikx & Gelders, 2010). The objectification strategy of figuration was employed in order to construct the ‘evidence’ of human agency as incontestable. Moreover, articles invoked death imagery in order to allude to some of the potential consequences of ignorance and inaction.

This article provides insight into the representational field in which climate change was located in its early days of politicisation. Rose et al. (1995) propose the notion of a representational field 'characterised by consensus, inconsistency and ambivalence'. Yet, permeating this 'incoherence, tension and ambivalence', there is a consensual 'reality' in relation to climate change, namely that it exists as a socio-environmental issue to be debated and discussed and that one must take a stance in relation to it (Breakwell & Millward, 1995). The competing social representations observed in this corpus provide the rhetorical tools for inconsistency, ambivalence and, more importantly, for debate and discussion (Boykoff, 2009), as well as the passionate defence of climate change as a 'reality' by some and its adamant denial by others (Hulme, 2009). Indeed, Billig (1987) has argued that social thinking is characterised by argumentation rather than pure consensus. The articles studied here exhibit a diversity of social representations active in the representational field of climate change as early as 1988, sowing the seeds for decades of argumentation and contestation. Indeed, in contemporary times, one observes the potential impact that major controversies such as Climategate seemed to have had for the representational field in which climate change is located (Nerlich, 2010). This may be understood as having decreased the clout of threat representations, while providing greater scope for disengagement, scepticism and outright denial.

Conclusion

1988 was characterised by a struggle over establishing meaning in relation to climate change that manifested itself in the flexible exploitation of hegemonic and polemic representations and their core and peripheral elements. The volatility and mutability of the peripheral elements in relation to the core of the social representation of climate change as a multifaceted threat leads to uncertainty over cause and effects and stimulates ongoing debates about what actions should or need to be taken. While Hulme (2009) tackles the question of 'why we disagree about climate change', this paper explored the diversity of social representations that emerged at the inception of the climate change debate and that still structure disagreements today. It provides detailed empirical insights into the 'starting-point' for present-day disputes and lays the theoretical foundations for tracking the continuities and discontinuities characterising social representations of climate change in subsequent decades and into the future.

REFERENCES

- Abric, J.-C. (2001). A structural approach to social representations. In K. Deaux & G. Philogène (eds.), *Representations of the social: bridging theoretical traditions* (pp. 42-47). Oxford: Blackwell.
- Anderson, A. (1997). *Media, culture and the environment*. New Brunswick, NJ: Rutgers University Press
- Beck, U. ([1986] 1992) *Risk Society: Towards a New Modernity*. London: Sage.
- Billig, M. (1987). *Arguing and thinking: a rhetorical approach to social psychology*. Cambridge: Cambridge University Press.
- Bourhis, R.Y. & Jaspal, R. (2011). Constructing threat appeals to legitimize dominant majority restrictions on access to minority language schools: a Canadian Supreme Court study. Manuscript submitted for publication.
- Boykoff, M.T. (2008). The cultural politics of climate change discourse in UK tabloids. *Political Geography*, 27(5), 549-569.
- Boykoff, M.T. (2009). Creating a climate for change: communicating climate change and facilitating social change. *Global Environmental Politics*, 9(2), 123-128.

- Boykoff, M.T. & Mansfield, M. (2008). 'Ye Olde Hot Aire': reporting on human contributions to climate change in the UK tabloid press. *Environment Research Letters* 3(2), 1-8.
- Braun, V. & Clark, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101.
- Breakwell, G.M. (1986). *Coping with threatened identities*. London: Methuen.
- Breakwell, G.M. (2001). Social representational constraints upon identity processes. In K. Deaux & G. Philogène (eds.), *Representations of the social: bridging theoretical traditions* (pp. 271-284). Oxford: Blackwell.
- Breakwell, G.M. & Millward, L.J. (1995). Sexual self-concept and sexual risk taking. *Journal of Adolescence*, 20, 29-41.
- Cabecinhas, Lazaro & Carvalho, (2008). Media uses and social representations of climate change. In A. Carvalho (ed.), *Communicating Climate Change: Discourses, Mediations and Perceptions* (pp. 170-89). Braga: Centro de Estudos de Comunicação e Sociedade, Universidade do Minho
- Carragee, K. & Roefs, W. (2004). The Neglect of Power in Recent Framing Research. *Journal of Communication*, 54(2), 214–33.
- Carvalho, A. & Burgess, J. (2005). Cultural Circuits of Climate Change in U.K. Broadsheet Newspapers, 1985–2003. *Risk Analysis*, 25(6), 1457–69.
- Carvalho, A. & Pereira, E. (2008). Communicating climate change in Portugal: a critical analysis of journalism and beyond. In A. Carvalho (ed.), *Communicating Climate Change: Discourses, Mediations and Perceptions*. Braga: Centro de Estudos de Comunicação e Sociedade, Universidade do Minho
- 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.
- Crowley, T.J. (2000). Causes of Climate Change Over the Past 1000 Years. *Science*, 289(5477), 270-277.
- Davies, B. & Harré, R. (1990). Positioning: the discursive production of selves. *Journal for the Theory of Social Behaviour*, 20, 43-63.
- Deming, D. (2005). *Global Warming, the Politicization of Science, and Michael Crichton's State of Fear*, *Journal of Scientific Exploration*, 19(2), 247-256.
- Dirikx, A. & Gelders, D. (2010). To frame is to explain: a deductive frame-analysis of Dutch and French climate change coverage during the annual UN Conferences of the Parties. *Public Understanding of Science*, 19(6), 732-742.
- Douglas, M. (1992). *Risk and blame: essays in cultural theory*. London: Routledge.
- Fleming, J.R. (1998). *Historical perspectives on climate change*. Oxford: Oxford University Press.
- Gervais, M.-C. (1997). Social Representations of Nature: The Case of the Braer Oil Spill in Shetland. Unpublished PhD thesis, Department of Social Psychology, London School of Economics, UK.
- Hayes, N. (1997). Theory-led thematic analysis: social identification in small companies. In Hayes, N (Ed.), *Doing qualitative analysis in psychology* (pp. 93-114). London: Psychology Press.
- Hogg, M.A. (2000). Subjective uncertainty reduction through self-categorization: a motivational theory of social identity processes. *European Review of Social Psychology*, 11, 223–255.
- Höijer, B. (2010). Emotional anchoring and objectification in the media reporting on climate change. *Public Understanding of Science*, 19(6), 717-731.
- Hulme, M. (2008). Geographical work at the boundaries of climate change. *Transactions of The Institute Of British Geographers*, 33(1), 5-11.

- Hulme, M. (2009). *Why We Disagree about Climate Change*. Oxford: Oxford University Press.
- IPCC (2007). In: Solomon, S., Qin, D., Manning, M., Marquis, M., Averyt, K., Tignor, M.M.B., Miller Jr., H.L., Chen, Z. (Eds.), *Climate Change 2007: The Physical Science Basis*, WGI Contribution to the Fourth Assessment Report of the IPCC, Cambridge University Press, Cambridge, UK, 996pp
- Jaspal, R. (2011). *The construction and management of national and ethnic identities among British South Asians: an identity process theory approach*. Ph.D. dissertation, Royal Holloway, University of London, UK.
- Jaspal, R. & Cinnirella, M. (2010). Media representations of British Muslims and hybridised threats to identity. *Contemporary Islam: Dynamics of Muslim Life*, 4(3), 289-310.
- Joffe, H. (1999). *Risk and 'The Other'*. Cambridge, UK: Cambridge University Press.
- Karl, T.R & Trenberth, K.E. (2003). Modern global climate change. *Science*, 302(5651), 1719-1723
- Kellogg, W.W. (1987). Mankind's impact on climate: The evolution of an awareness. *Climatic Change*, 10(2), 113-136
- Kempton, W., Boster, J & Hartley, J. (1995). *Environmental Values in American Culture*. Cambridge: MIT Press.
- Kieran, M. (Ed.) (1998). *Media Ethics*. London: Routledge.
- Leiserowitz, A.A. (2005). American Risk Perceptions: Is Climate Change Dangerous? *Risk Analysis*, 25(6), 1433-42.
- Leiserowitz, A.A. (2006). Climate change risk perception and policy preferences: the role of affect, imagery and values. *Climatic Change*, 77, 45-72.
- Mann, M.E., Bradley, R.S. & Hughes, M.K. (1998). Global-scale temperature patterns and climate forcing over the past six centuries. *Nature*, 392, 779-787 .
- Mazur, A. (1998). Global Environmental Change in the News: 1987-90 vs 1992-6. *Global Environmental Change*, 13(4), 457-472.
- McCright, A.M. (2007). Dealing With Climate Change Contrarians. In S.C. Moser & L.Dilling (eds.), *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change* (pp.200-12). New York: Cambridge University Press.
- Moscovici, S. (1963). Attitudes and opinions. *Annual Review of Psychology*, 14, 231-260.
- Moscovici, S. (1973). Foreword. In C. Herzlich (Ed.), *Health and illness: A social psychological analysis* (pp.ix-xiv). London/New York: Academic Press.
- Moscovici, S. (1981). On social representations. In J.P. Forgas (Ed.), *Social Cognition: Perspectives on everyday understanding* (pp.181-209). London: Academic Press.
- Moscovici, S. (1988). Notes towards a description of social representations. *European Journal of Social Psychology*, 18, 211-250.
- Moscovici, S. & Hewstone, M. (1983) Social representations: from the 'naive' to the 'amateur' scientist. In M. Hewstone (ed.) *Attribution Theory: Social and Functional Extensions*. Oxford: Basil Blackwell.
- Nerlich, B. (2010). Climategate': Paradoxical Metaphors and Political Paralysis. *Environmental Values*, 19(4), 419-442.
- Nerlich, B. & Jaspal, R. (2011). Metaphors we die by? Geoengineering, metaphors, and the argument from catastrophe. Manuscript submitted for publication.
- Olausson, U. (2009). Global warming – global responsibility? Media frames of collection and scientific certainty. *Public Understanding of Science*, 18(4), 421-43.
- Parry, M.L., Carter, T.R. & Hulme, M. (1996). *What is a dangerous climate change? Global Environmental Change*, 6, 1-6.

- Pearce, J.M. & Stockdale, J.E. (2008) UK responses to the asylum issue: a comparison of lay and expert views. *Journal of community & applied social psychology*, 19(2), 142-155.
- Risbey, J. (2008). The new climate discourse: alarmist or alarming? *Global Environmental Change*, 18(1), 26-37.
- Rose, D., Efraim, D., Gervais, M., Joffe, H., Jovchelovitch & Morant, N. (1995). Questioning consensus in social representations theory. *Papers on Social Representations*, 4(2), 1-6.
- Royal Society Working Group (2010). *Climate change: a summary of the science*. London: The Royal Society.
- Stephan, W.G. & Stephan, C.W. (2000). An integrated threat theory of prejudice. In S. Oskamp (Ed.), *Reducing prejudice and discrimination* (pp. 23-46). Mahwah, NJ: Erlbaum.
- Taylor, G. R. (1970) *The Doomsday Book*. New York: World Publishers.
- Taylor, S. E. (1983). Adjustment to threatening events: a theory of cognitive adaptation. *American Psychologist*, 38, 1161–1173.
- Ungar, S. (1992). The rise and (relative) decline of global warming as a social problem. *The Sociological Quarterly*, 33, 483–501
- Vala, J., Garcia-Marques, L., Pereira, M., Lopes, D. (1998). Validation of polemical social representations: Introducing the intergroup differentiation of homogeneity. *Social Science Information*, 37, 469-492.
- Van Dijk, T.A (1993). Principles of critical discourse analysis. *Discourse & Society*, 4(2), 1993, 249-283.
- Voelklein, C. & Howarth, C. (2005). A review of controversies about social representations theory: a British debate. *Culture and psychology*, 11(4), 431-454.
- Waert, S. (2003-2007). The Discovery of Climate Change. Online resource: <http://www.aip.org/history/exhibits/climate/index.html>
- Wagner, W., Elejabarrieta, F. & Lahnsteiner, I. (1995). How the sperm dominates the ovum – objectification by metaphor in the social representation of conception. *European Journal of Social Psychology*, 25, 671-88.
- Whitmarsh, L. (2005). A study of public understanding of and response to climate change in the South of England. Unpublished doctoral dissertation, University of Bath, UK.
- Whitmarsh, L. (2009). What's in a name? Commonalities and differences in public understanding of 'climate change' and 'global warming'. *Public Understanding of Science*, 18, 401-420.

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- ⁱ *The Guardian* 13 February 1988
ⁱⁱ *The Guardian* 3 March 1988
ⁱⁱⁱ *The Guardian* 15 March 1988
^{iv} *The Guardian* 18 June 1988
^v *The Guardian* 19 June 1988
^{vi} *The Guardian* 5 July 1988
^{vii} *The Guardian* 3 March 1988
^{viii} *The Times* 26 April 1988
^{ix} *The Guardian* 25 June 1988
^x *The Times* 28 December 1988
^{xi} *The Guardian* 28 June 1988
^{xii} *The Guardian* 5 March 1988
^{xiii} *The Times* 5 January 1988
^{xiv} *The Guardian* 28 June 1988
^{xv} *The Times* 28 September 1988
^{xvi} *The Times* 12 July 1988
^{xvii} *The Times* 20 August 1988
^{xviii} *The Times* 29 September 1988
^{xix} *The Times* 26 April 1988
^{xx} *The Guardian* 25 June 1988
^{xxi} *The Times* 28 August 1988
^{xxii} *The Times* 28 June 1988