

Contesting science by appealing to its norms: Readers discuss climate science in the *Daily Mail*

Rusi Jaspal & Brigitte Nerlich
Institute for Science and Society, School of Sociology and Social Policy, University of
Nottingham

Nelya Koteyko
Department of Media and Communication, University of Leicester

Climate change is one of the most pressing global challenges of the contemporary era and there is general scientific consensus that human activities are contributing to it. Debates around climate change and climate science are embedded within what has been referred to as a diverse social representational field, characterised by multiple, potentially conflicting modes of communication. Using critical discourse analysis, this study examines the communication and contestation of climate change in a corpus of reader comments on newspaper articles published in *The Daily Mail* in the aftermath of ‘Climategate’. The analysis is informed by social representations theory. The following discursive themes are reported: (i) “Denigration of climate scientists to contest hegemonic representations; (ii) “Delegitimisation of pro-climate individuals by disassociation from ‘science’”; and (iii) “Outright denial: rejecting hegemonic social representations of climate change”. The paper shows how ‘Climategate’ can be deployed in order to challenge and reject dominant representations of climate change with wide-ranging implications for public understanding of climate change and science communication, more generally. Theoretical implications are discussed.

Keywords: climate change; scepticism; communication; social media; social representation; public understanding; critical discourse analysis; social psychology

* Correspondence: Dr Rusi Jaspal, Institute for Science and Society, School of Sociology and Social Policy, Law and Social Sciences Building, University of Nottingham, Nottingham NG7 2RD, United Kingdom. E-mail: rusi.jaspal@gmail.com

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Readers discuss climate science in the *Daily Mail*

Climate change is one of the most pressing global challenges of the contemporary era and there is general scientific consensus that human activities are contributing to it. Campaigners have stepped up efforts to encourage engagement with climate change (Crompton & Kasser, 2010), while so-called climate sceptics and deniers have mobilised collectively in order to expose the perceived inaccuracies of climate science (e.g. Mann, 2012; Montford, 2010; for examples of the two ‘sides’ in the climate change debate). Debates around climate change and climate science are embedded within what has been referred to as a diverse social representational field, characterised by multiple, potentially conflicting social representations (Rose et al., 1995). Given the abundance of social representations of climate change circulating in the traditional and new social media, these spaces have transformed themselves into major sites for conflict, contestation and negotiation.

This diverse and, in many cases, divergent social representational field may explain the ambivalent responses to climate change manifested by the public (e.g. Exley & Christie, 2003), despite the abundance of information available (Whitmarsh, 2005). In order to understand the diverse responses to climate change, social scientists have turned their attention to analysing the content and communicative strategies of major channels of societal information, particularly the news media. This tradition of research examines media representations of climate change, such as trends in media reporting (Boykoff, 2011; Brulle et al, in press), and the discursive aspects of climate change communication (Nerlich, 2010; Olausson, 2009), sometimes linking these observations to public understanding of climate change (Cabecinhas et al., 2008). However, there has been little attention to the discursive aspects of laypeople’s talk and text about climate change, particularly in social media settings where this talk can itself create ripples of meaning in the wider social representational field.

Here it is argued that there is much heuristic and theoretical value associated with the analysis of user generated content, in this case online reader comments on media reporting of climate change, as one context of social and political contestation of the environmental issue. One field of contestation within this battlefield of ideas around climate change is the idea of ‘science’ itself. This article examines the legacy of the 2009 ‘climategate’ affair on public perception of (climate) science as expressed in a small and well-circumscribed sample of reader comments.

Social representations theory

This study is concerned with how readers respond rhetorically to the issue of climate change, complementing existing research from a realist epistemology that examines cognitive, and particularly attitudinal, responses (Leiserowitz, 2006; Leiserowitz et al., 2006). Social representations theory (SRT) was designed to address human responses, both cognitive and rhetorical, to scientific information, by treating seriously the information that circulates in society and the ideas in people’s minds (Billig, 1988, 1993). 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, social representations of climate change provide social groups in particular contexts with a shared social ‘reality’ and ‘common consciousness’ of this environmental problem, facilitating meaning-making (Olausson, 2009).

In his analysis of how representations are formed, Moscovici (1988) outlines the processes of *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, Jaspal and Nerlich (in press) have shown that in 1988 the British Press began to anchor global warming to imagery of widespread destruction and catastrophe, implicitly highlighting the need for mitigation against climate change. Objectification is the process whereby unfamiliar and abstract objects are transformed into concrete and ‘objective’ common-sense realities. Physical characteristics are attributed to a non-physical entity, essentially ‘materialising’ the immaterial. For example, Olausson (2011) has shown that her interview respondents objectify climate change in terms of polar bears and flooding and that these visual representations come to function as ‘evidence’ of climate change (see also Nerlich & Jaspal, forthcoming). A critical discourse analytical approach to anchoring and objectification can elucidate how these processes function discursively in the domain of text and talk (Billig, 1988; van Dijk, 1993).

In terms of social representational structure, Abric (2001) has distinguished between the *core* and *peripheral* elements of a representation. 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 language-oriented 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 reader comments on media reporting of climate change.

Social representations are shared and accepted by individuals to differing degrees (Moscovici, 1981). *Hegemonic* social representations are shared consensually by members of a group; they are coercive and relatively uniform. In West European countries, hegemonic representations concerning climate change construct it as (i) a genuine, serious environmental problem which is likely to worsen if significant action is not taken (Olausson 2009, 2010); and (ii) caused largely by human and industrial actions and therefore requiring mitigation strategies (Berglez, Hoijer & Olausson, 2009; Olausson, 2009, 2010). Conversely, *polemic* representations are generated in the course of social conflict and are characterised by antagonistic relations between groups. Typically, polemic representations challenge or contest hegemonic representations. In Western European societies, polemic representations construct climate change as (i) a ‘naturally-induced’ environmental phenomenon which cannot be mitigated against; or (ii) a non-existent ‘scam’ perpetrated by government, scientists and other institutions (Nerlich & Koteyko, 2009). Clearly, social power plays an important role in determining whether a representation is hegemonic or polemic and power relations determine the influence a group has in disseminating and ‘hegemonising’ its representations (Breakwell, 1993). This paper investigates this phenomenon in the context of reader comments (van Dijk, 1993).

The construction and contestation of climate change

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 the environmental issue (Boykoff & Mansfield, 2008; Carvalho, 2007; Carvalho & Pereira, 2008). The advent of the Internet has engendered a tradition of

research into social media coverage of climate change (Porter & Hellsten, forthcoming), given that the Internet has become such as an important ‘site’ for the climate debate (Brulle et al., in press).

Traditional and new social media, collectively, contribute to the diverse social representational field of climate change, which has produced equally diverse individual and social responses to the environmental issue. Broadly speaking, this diverse field has given rise to two distinguishable politico-ideological ‘camps’: climate campaigners and climate sceptics/deniers. Climate change campaigners and pressure groups have stepped up efforts to mitigate against climate change, by advocating behaviour change and supporting initiatives for carbon emission reductions (Gough & Shackley, 2001); together with climate scientists who provide supporting evidence for ‘anthropogenic global warming’ or AGW. Conversely, climate sceptics/deniers consist of coordinated anti-environmental countermovements, which have emerged in order to contest hegemonic representations of climate change (McCright, 2007; McCright & Dunlap, 2011). These camps have each disseminated their respective social representations of climate change to the general public, through a variety of sources including the media (and especially the social media), creating ‘ripples’ in public understanding of climate change. For example, survey data collected in the UK show that public belief in climate change dropped from 91% in 2005 to 78% in 2010, and that climate scepticism (that is, those who deny that the climate is changing) have increased from 4% in 2005 to 15% in 2010 (Poortinga et al., 2011). These data seem to indicate that antagonism between the two camps, especially prominent in the United States since the 2009 ‘Climategate affair’ (Nerlich, 2010; Painter, 2010; Brulle et al., in press), may have influenced public understanding of climate change, potentially resulting in a decline in public trust in climate science, as well as leading to increased scepticism concerning the impact and even existence of climate change as a global environmental problem.

Climategate, where hacked emails seemed to demonstrate that climate scientists had manipulated data and suppressed critical voices, provided supporters of the climate change contestation camp with an opportunity to frame climate science as faulty, fraudulent and even a ‘scam’, a framing that was already present before (Nerlich & Koteyko, 2009), but now seemed to be based on evidence. Clearly, the ‘framing contest’ which was crystallised during climategate both in media representation and in social debate requires empirical investigation, with particular attention to the rhetorical and argumentative aspects of this area of social and political contestation (Anderson, 1997). This paper offers such insight.

In addition to its role as a channel of societal information regarding climate change, the Internet has created cyberspaces for the reproduction, dissemination and development of multifarious social representations, creating a site for social and political contestation. Thus, in this article we examine some of the dynamics of these representations by looking at reader ‘voices’, that is, the voices of the *consumers* of these new media, following climategate. Furthermore, reader comments on media reporting of climate change provide an ideal case study for the examination of the rhetorical aspects of social and political contestation, since (i) they can be anonymous; (ii) there is scope for interaction between commentators, providing insight into argumentation; (iii) they have the potential to influence others’ comments; (iv) and they may reflect more widely distributed social representations and collective beliefs particular to at least a subsection of the British public.

This paper examines the rhetorical aspects of social and political contestation of climate change (i) within these discursive sites, (ii) subsequent to a politically polarising event such as climategate. The aim is to reveal the discursive strategies employed by stakeholders in order to *construct* particular versions (that is, social representations) of

climate change; to *contest* alternative representations; and to *convince* others of the validity of one's constructed version of climate change.

METHOD

This study focuses upon reader comments on articles published in the tabloid Press, because their unmatched circulation rates in Britain suggest that tabloid newspapers constitute a potentially important source of social representations (Conboy, 2006). Of the three biggest-selling tabloid newspapers in Britain, only *The Daily Mail* was deemed suitable for the kinds of analyses employed in this study. *The Daily Mail* website database contained a sufficiently large number of reader comments, providing a corpus of data suitable for corpus-assisted discourse analysis (see below). Most mainstream broadsheet and tabloid newspapers provide space for commentary from readers. In order to leave comments on newspaper articles, readers need to create an online account, using either a pseudonym or their real name and log in.

Reader comments on *The Daily Mail*'s coverage from 2010 constitutes a suitable empirical point of departure, as they allow us to chart the effect of climategate upon the popular debate about climate change. This complements empirical research conducted in the immediate aftermath of climategate (e.g. Leiserowitz, 2010; Nerlich, 2010).

Using the keyword 'climate change', a search was conducted on the news output of *The Daily Mail* website (www.thedailymail.co.uk) between 1st January and 31st December 2010. This process revealed 355 relevant news articles. It is noteworthy that not all articles were commented upon by readers, but all available comments were recorded in a separate document. The large number of comments (4698 comments in total) harvested from the Daily Mail website necessitated the use of both quantitative and qualitative methods of text analysis. Drawing on the techniques of corpus assisted discourse analysis (Koteyko, 2010;

Partington, 2003) we first established the dominant lexical patterns in our collection (or corpus) of comments (for more detail see Koteyko et al, forthcoming) and examined the contexts of use in the form of concordances provided by WordSmith Tools version 6¹. The obtained results served as a guide for downsampling, and the concordances of the words ‘science’ or ‘scientist/s’, two of the most frequent lexical items in the corpus, emerged as one candidate area for a close study. The analysis below is based on this subcorpus of concordance lines (1907 in total); as part of close reading and coding, whole comments were also routinely retrieved.

Analytical approach This qualitative component of the study offers a fine-grained critical discourse analysis (CDA) of reader commentary on tabloid articles (van Dijk, 1993, 2006, 2009). CDA is a language-oriented analytical technique for identifying patterns of meaning within a data set with particular foci on the micro and macro levels of linguistic analysis. It aims to integrate discourse, cognition and power, bridging the epistemological positions of social constructionism and realism. The patterns of meaning identified in CDA are represented as ‘discourses’. The technique provides insight into how social reality is constructed in talk and text, acknowledging the possibilities offered by, and potential constraints imposed by, social power relations (van Dijk, 1993). CDA helps reveal the rhetorical strategies for affirming and contesting hegemonic and polemic social representations. This study positions itself within the CDA tradition, which synthesises discourse analysis, social constructionism and SRT (e.g. van Dijk, 1993; Luyt, 2003).

CDA was considered particularly useful due to its theoretical foci, which lie in describing (i) control, that is, how groups exert control over others through persuasion or by constructing their agenda as ‘natural’; (ii) the ‘discourse access profile’, that is, the audiences

¹ The WordSmith software allows for quantification of the most commonly used words in a given corpus as well as a quick retrieval and sorting of stretches of text where a search term was used.

and media to which stakeholders can disseminate their social representations; (iii) social cognition, namely that discourse can create and feed into social representations; and (iv) rhetorical strategies, namely the ways in which stakeholders describe, rationalise, justify, defend and contest particular versions of climate change. Crucially, CDA provides an analysis which goes beyond mere description, creating scope for the development of theory in the aforementioned areas.

Procedure The selected reader comments were read repeatedly. The right margin was used to note emerging observations which captured essential qualities and units of meaning and apparent rhetorical techniques within the data. These initial codes included *inter alia* the general tone of the comment, particular forms of language (e.g. metaphor), comparisons, categorisations and emerging patterns within the data. Subsequently, the right margin was used to collate these initial codes into preliminary discursive themes, which captured the essential qualities of the comments analysed. Codes were pieced together in order to identify superordinate discursive themes, which addressed the original research questions concerning construction, defence and contestation of climate change representations.

Crucially, there was a theoretical concern with the use and development of social representations of climate change in reader commentary, rather than an empirical concern with providing an overview of what the public thinks about the environmental issue (see Rose et al., 1995). Thus, extracts from the comments are selected in order to make overarching theoretical points, rather than to reflect general tendencies across the data set. The selected discursive themes were reviewed rigorously against the corpus of data in order to ensure their compatibility and numerous extracts from the comments were listed against each corresponding theme. It was at this stage that specific comments or extracts from the comments, which were considered vivid, compelling and representative of the themes, were selected for illustration. Finally, three superordinate discursive themes representing the

results of 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 CDA.

In the extracts that are presented in the analysis section, three dots within square brackets indicate where material has been excised; and other material within square brackets is clarificatory.

ANALYSIS

The analysis describes the following discursive themes: (i) “Denigration of climate scientists to contest hegemonic representations; (ii) “Delegitimisation of pro-climate individuals by disassociation from ‘science’”; and (iii) “Outright denial: rejecting hegemonic social representations of climate change”.

Denigration of climate scientists to contest hegemonic representations

There was a pervasive tendency for commentators to denigrate climate science. The aim was to delegitimise the ‘science’ upon which hegemonic social representations of climate change are based. This over-arching delegitimising process enabled commentators to contest, though not necessarily to reject in its entirety, the hegemonic social representation that climate change is occurring. It is noteworthy that social representations vary in their level of hegemony, uniformity and coerciveness, affecting scope for re-construal (Jaspal & Coyle, 2009). In the following extract, for instance, the representation that climate change is occurring seems ‘too’ hegemonic to reject:

(1) I find it impossible to deny that ‘climate change’ is occurring.....the place [planet] is warming up and the general trend is the ‘ice-cap’ is melting, Greenland is now green not white, etc. Etc.

The social representation that climate change exists is anchored to personal observations that ‘the place is warming up’ and to the ‘general trend’ that the ice-cap is melting. This demonstrates the hegemony of the representation, rendering it difficult to reject. However, the same commentator does seize the opportunity to delegitimise rhetorically the scientists who create and disseminate these hegemonic representations of climate change:

(2) What I have trouble with is that is all down to ‘carbon’ I feel that the scientists have not been completely honest with their research, and now we have politicians in ‘cahoots’ with the worlds stock-markets trying to sell us ‘carbon credits’.....I just have the feeling that the ‘sharp operators’ amongst us have seen a good way to separate us gullible types from our money by using a ‘feel good’ factor to do it, whilst at the same time doing nothing for our environment!

Although the commentator may feel unable to reject the social representation itself, they nonetheless challenge the peripheral element of the representation that it ‘is all down to ‘carbon’’. The commentator’s challenging of this peripheral element is supported rhetorically by reproducing the emerging social representation that ‘scientists have not been completely honest with their research’. This polemic representation gained particular momentum subsequent to climategate (Nerlich, 2010). This is one way of rhetorically challenging a hegemonic representation. The strategic invocation of a competing polemic social representation can contest a peripheral element of the representation, which can in turn undermine the representation as a whole. This can disrupt the relationship between the ‘core’ of the representation and its peripheral element, whose primary aim is to support the ‘core’ (Abric, 2001). Furthermore, in extract 2 the constructed dishonesty of scientists is in turn anchored to politicians, who are discursively and ironically constructed as manipulating ‘us gullible types’ and watering down what is still posited as ‘good science’. The primary

concern of politicians is constructed as being after 'our money', rather than caring for the environment. Collectively, these rhetorical strategies seem to perform the function of constructing scientists as inherently fraudulent.

Through the process of anchoring (Moscovici, 1988), some of the negative, denigrating characteristics attributed to politicians are implicitly associated with or transferred to scientists who themselves have 'not been completely honest with their research'. Indeed, the anchoring of science to politics was observable in the corpus, as exemplified by extract 3:

(3) Science is the search for truth. Politics is the generation of lies to support personal agendas. The two do not mix. Science is likened unto fine wine. Lies, unto sewage. So how much sewage is acceptable in your wine? How much feces [*sic*] will YOU personally swallow? The earth changes and MAN can't do a thing. Name ONE THING that can be done to prevent an earthquake. If these 'models' are so accurate, why was data omitted? That is the practice of a politician, not a scientist. The practice of a child, not an adult.

While science (overall) is constructed in terms of 'the search for truth', politics is depicted as 'the generation of lies to support personal agendas'. The commentator separates the two constructs theoretically, while arguing that in the domain of climate science they have become entwined. Thus, the negative characteristics attributed to politics (i.e. the metaphors of sewage and faeces; lies) are generalised to climate science, given the constructed similarities between the two constructs. Crucially, the hegemonic representation of climate science as a consensus-based aid to policy making is being challenged through its anchoring to politics. In addition to climate science being subsumed under politics (itself a caricature of politics as being entirely based on lies), climate science is also rhetorically positioned as

childish, in the sense of a child fabricating a world through something like pretend play. Most interestingly, the construction of climate science as political and childish scheming is contrasted with a very traditional, hegemonic, image of science as purveyor of authoritative truth (Agazzi, 2004), which is not contested. This type of rhetorical positioning of science is reflected in recent remarks by Professor Richard Lindzen who contrasted “the legitimate role of science as a powerful mode of inquiry” with “the pretence of science” and its politicisation in the context of climate change (Lindzen, 2012)

Hegemonic representations of climate change can be challenged by contesting the legitimacy of the *source* of these representations (Breakwell, 1986; Jaspal & Cinnirella, 2010). In the following extract, the interpretation of scientific findings is rhetorically distanced from the exclusive domain of scientists as a privileged source of knowledge and expertise:

(4) You don't need to be a scientist to understand scientific findings. Having a PhD I'm sure helps if your [*sic*] trying to perform research, but is no means necessary. Of course it'll increase your credibility, but you don't need to spend eight years in school to be educated [...] I know many people who have gone to school and don't understand the simplest concepts, sometimes even in their own field. My pint [*sic*] is, don't feel intimidated by someones [*sic*] title, just because they might have learned more about a particular subject does not mean they are smarter. Reading a scientific paper you only have to learn about what is in the paper and then tackle its reasoning without bias. Sometimes you have to realize that your reasoning may have been false but not always. Most papers have money and an agenda behind them, just because its written by a “scientist” doesn't mean its [*sic*] not intended to be misleading (even if its technically accurate)

Here the commentator seems to be establishing a suitable social position from which to contest hegemonic representations of climate change. They question the legitimacy of existing power relations between scientists and laypeople, challenging the authoritativeness and hegemony of scientists (Breakwell, 1986). Although a PhD ‘helps’ in the *research* process, it is constructed as being unnecessary, particularly in order to ‘understand’ scientific research findings. This account aims to empower laypeople to take a stance on hegemonic social representations of climate change. The commentator associates common errors, bias and ‘false reasoning’ with scientists, who typically are socially represented in terms of precision and accuracy (Agazzi, 2004). In the final sentence the extract introduces a third peripheral element, namely that scientists can actively intend their scientific papers to be ‘misleading’, since there is a financial ‘agenda’. The peripheral elements that (i) in ‘real terms’ there are few differences between scientists and laypeople (ii) both scientists and laypeople’s judgement and reasoning can be ‘false’; (iii) there are financial incentives for the publication of deliberately misleading science, collectively, construct a delegitimising social representation of climate scientists as untrustworthy. Furthermore, having attenuated power differentials between scientist and layperson, readers are implicitly encouraged to take a favourable stance on this delegitimising social representation of climate science. This performs a ‘hegemonising’ function vis-à-vis the representation.

The third peripheral element of this delegitimising representation concerning the deliberate ‘falseness’ of climate science is further developed in other extracts in the corpus:

- (5) Well perhaps if these “scientists” had not used false research, lied and been found out, they would not have been treated badly your Highness [Prince Charles].
- (6) Why are the police not questioning the “scientists” putting out false information supporting global warming?

(7) I suppose when being funded and controlled by a corrupt government the departments concerned would have to employ scientists who could be bought - which is what appears to have happened in this case. They should not be allowed to get away with this. They CHEATED to further the purposes of the carbon credits crew, they knew what they were doing.

In response to an article describing Prince Charles' criticism of the 'appalling treatment' of scientists associated with climategate, the author of extract 5 constructs a rationale and justification of this treatment by invoking 'false research', lies and hypocrisy. Moreover, the category 'scientists' is discursively problematised through its positioning within inverted commas. As in extract 2, an implicit distinction is made between good science and bad science, good scientists and bad scientists, where the image of good science and scientists conforms to established norms of science, whereas climate scientists are positioned as breaching these norms, and as being corrupted by politics and money.

Similarly, in extract 6 the peripheral element of financially-motivated false research is reiterated, although here it is constructed specifically in terms of a criminal act worthy of police attention. This serves to accentuate the legal, not only moral, severity of the alleged behaviour. Furthermore, in extract 7, there is clear accentuation of the peripheral element that there is financially motivated corruption within the domain of science. More specifically, it is 'funded and controlled by a corrupt government'. The 'cheating' of scientists is attributed to the financial benefits allegedly associated with 'carbon credits'. Discrediting scientists in this way is rather novel, as it links (pure) climate science directly to climate policy which sets or manages 'carbon credits'. The possibilities to engage in fraud in the latter are projected directly onto the former. The peripheral element of financial gain is most effective in its support for and reinforcement of the polemic representation that climate scientists are

untrustworthy. Overall, climate science (as opposed to an image of pure or proper science) is socially represented as inherently fraudulent and subservient to politics and finance (greed).

Delegitimisation of pro-climate individuals by disassociation from ‘science’

Although some commentators denigrated climate science in order to contest hegemonic social representations, a large number of comments conversely *accepted* positive social representations of science but rhetorically disassociated climatologists and climate campaigners from the category ‘science’. For instance, extract 8 distances Al Gore from ‘science’, which is interesting in itself, as he is not actually a scientist:

(8) Don't forget who started this Global Panic. It was Al Gore. Gore stood to gain hundreds of millions of dollars if the U.S. and other countries enacted laws he was pushing to reduce Carbon in the atmosphere. This is not Gore's first try at global panic for financial gain. Remember the Ozone layer crisis he created about 15 years ago. He claimed that the Ozone layer was collasping [*sic*] and would caue [*sic*] world ruin if we did not pass laws to protect the Ozone [...] Gore is not the Scientist he pretends

The ‘Global Panic’ of climate change is attributed almost entirely to Al Gore, a former US presidential candidate and recipient of the Nobel Peace Prize for his climate activism (Hulme, 2009). The commentator distances climate science from the domain of science and conversely constructs it in terms of a scheme to ‘gain hundreds of millions of dollars’. Again, as in the previous section, there seems to be an underlying (hegemonic) social representation at work here that dissociates (pure or proper) science from money and therefore claims that any contact between science and money renders science immediately impure, improper, fraudulent or untrustworthy; money is seen as tainting or sullyng the ‘purity’ of science. In this context, climate change is represented as a money making scheme rather than a scientific

reality and climate science as improper science. Similarly, the commentator constructs the ‘Ozone layer crisis’ as a ‘creation’ of Al Gore. This is similarly observable in extract 8. Crucially, the commentator constructs climate change and ozone depletion as the exclusive domain of scientists, from which Al Gore is rhetorically excluded: ‘Gore is not the Scientist he pretends’. This serves to represent Al Gore as an imposter, on the one hand, and essentially disqualifies him from ‘creating’ what is regarded as ‘this Global Panic’, on the other.

Similarly, the commentator in extract 9 does not delegitimise the categories ‘science’ or ‘scientist’ *per se*, but rather distances pro-climate change individuals from this domain. Al Gore is delegitimised on the basis that he is posited as ‘pretending’ to be a scientist (which can be disputed, as he is undoubtedly a politician who relies on science rather than a scientist). In the next extract a scientist is delegitimised on the basis of positioning him as ‘just an (Indian) engineer’, therefore also implying some sort of pretence. In both cases their efforts at making or advising on climate change policy are undermined by dismissing their legitimate associations with science.

(9) Climate always changes, so why are we trying to stop it. We just saw the lies about glaciers retreating apparently based on a comment by some Indian chap, who now admits he was just “speculating”, and this is used by IPCC as evidence. The head of this organisation turns out to be not “The worlds top climate scientist!” As the BBC would have it, but a railway engineer, with vested business interests. Then theres “climategate”, thriving polar bears, sea levels rising modestly since the last ice age, and not threatening pacific islands at all. The list goes on and on and on and on.

The commentator in extract 9 begins by acknowledging the hegemonic representation that the climate is changing, while emphasising a peripheral element of this representation that it

constitutes a largely natural, rather than human-induced, process (Jaspal & Nerlich, in press). The commentator's observation that there have been recent 'lies about glaciers retreating' serves to justify rhetorically the position, since it essentially serves to construct a growing 'culture' of lies surrounding climatology. Climategate serves as important rhetorical anchor and is implicitly linked to 'glacier-gate' (Walsh, 2010).

The commentators lend credibility to their social representational position by delegitimising the disseminator of these 'lies'. The commentator refers to Dr Rajendra Pachauri not in terms of his academic, professional or scientific position, but rather in terms of 'some Indian chap'. On the one hand, the climate scientist is distanced from the domain of science, thereby disqualifying him rhetorically from making scientific assertions. The adjective 'some' constructs him as an unknown, interchangeable figure, rather than as a scientist with a potentially unique and informed contribution to make to the climate debate. The invocation of the scientist's ethno-national background renders this category salient vis-à-vis the more relevant category of 'scientist', potentially activating images of foreignness and ineligibility to make scientific assertions. Similarly, in his pioneering study of racism in the Press, van Dijk (1991) has shown how the media's accentuation of irrelevant elements of an individual's identity can help to undermine the credibility of the individual's assertions in the eyes of the reader. The delegitimation of the scientist is further reinforced by the commentator's use of the colloquial, and in this context derogatory, noun 'chap', constructing him in terms of a layperson, rather than as a climate scientist. The head of the IPCC is constructed as lacking the scientific expertise to manage the IPCC, on the one hand, and who has 'vested business interests', on the other. As echoed in the previous section, vested business interests, financial incentive and bureaucratic greed make up a supporting peripheral element of this social representation concerning their (professional) distance from the domain of science. Crucially, it is not the domain of science that is problematised, but rather, pro-

(anthropogenic) climate change individuals, by virtue of their rhetorical distancing from the domain of science. Conversely, anti-(anthropogenic) climate change individuals are posited as representing 'true' science.

The contestation of hegemonic representations requires a 'strong' speaking-position, which can be achieved by questioning traditional 'criteria' for making scientific assertions (see extract 4). In extract 12, the commentator does this by contrasting their own scientific background with the non-scientific background of Prince Charles as well as that of climate scientists other than himself ('so-called scientists'):

(12) Charles is not a scientist. I am. Charles thinks that the treatment of the 'climategate' so-called scientists was appalling. What appals me is that those so-called scientists have been allowed to continue with their disgraceful pseudo-science. Many other scientists, some of them distinguished and eminent, are equally appalled by the disgraceful and unscientific antics revealed by the climategate information, though we had already been aware of those antics even before that information provided the confirmation. Like many others, I have not found one shred of convincing evidence to support the hypothesis of man-made global warming. What I have found is that there is an abundance of evidence to the contrary, all of which is being studiously ignored. Ignoring inconvenient data is not what real scientists do. Nor do real scientists manipulate data to make it look as if it supports a pre-conceived idea.

The commentator re-categorises hegemonic social representations of climate science in terms of 'pseudo-science'. 'Many other scientists' are said to share the view that such pseudo-science is 'disgraceful', 'appalling' and, perhaps most importantly, 'unscientific'. This constructs the representation as consensual. The commentator legitimises his own evaluation

of ‘pseudo-science’ by positioning himself as a ‘real’ scientist (vis-à-vis Prince Charles) (Davies & Harré, 1999). Climategate is represented as ‘confirming’, rather than necessarily revealing, the alleged wrong-doing. Having represented himself as a scientist, the commentator proceeds to contest hegemonic social representations of human-induced climate change by denying the existence of ‘convincing (scientific) evidence’. Conversely, ‘so-called scientists’ are represented as denying ‘evidence to the contrary’. This enables the commentator to construct mainstream climate science as ‘not what real scientists do’, that is, ‘pseudo-science’. The overarching aim here is to delegitimise climate scientists.

“Outright denial: *rejecting* hegemonic social representations of climate change”

Climategate may rhetorically empower relevant stakeholders to deny climate change in its entirety and to thereby *reject* hegemonic representations of climate change. For instance, some commentators rejected the role of human beings in (anthropogenic) climate change:

(13) Perhaps now people will come to realise that man-made global warming is a big scam. It’s an excuse for politicians to tax us in the name of ‘green taxes’; it’s an excuse for researchers with green agendas to get huge grants and government funding (wrong agenda, no grants of course); it’s an excuse for stealth taxes of billion (possibly trillions) via carbon trading schemes; and it’s an excuse for the hypocrisy and unseemly money-grabbing seen in Copenhagen.

The ‘big scam’ of ‘man-made global warming’ is constructed as commonsensical knowledge, which people should now ‘realise’. The commentator attributes peripheral elements of meaning to the polemic social representation that ‘man-made global warming is a big scam’. Firstly, it is a *political* scheme to generate income from ‘green taxes’ and ‘carbon trading

schemes'; and secondly, it is an *academic* scheme to generate 'huge' research grants. Money seems to be the rhetorical anchor that commentators use to undermine, denigrate and reject science and scientists. These peripheral elements are reinforced through the observation of 'unseemly money-grabbing', which is attributed to politicians and scientists who disseminate the hegemonic representation contested by the commentator. This is consistent with the peripheral element identified in extract 3, namely that there are financial incentives for the development of climate science. Here this peripheral element supports the polemic representation that man-made climate change does not exist (Abrić, 2001). This essentially attributes meaning to the polemic representation, lending it further credibility and providing scope for its 'hegemonisation' (Jaspal & Yampolsky, 2011).

In the same comment post, the commentator delegitimises climate scientists by drawing upon climategate. Anchoring the representation that climate change is a scam to climategate serves to undermine the hegemonic representation of climate change:

(14) As the emails and computer programmes hacked from the Climatic Research Unit at the University of East Anglia proved these so-called climate scientists have fiddled the data and suppressed any dissent by devious means. We are being manipulated and ripped off. Thank you Daily Mail for showing some guts and printing this story. Maybe you can go all the way and reveal just how much this rotten money-making scheme is costing us already.

In extract 14, use of the verb 'to prove' suggests unequivocal evidence to support the claim that 'so-called scientists', that is, imposters, have fabricated data and stifled debate regarding climate change 'by devious means'. This version of events challenges usual ways of thinking about scientists. There is a discursive polarisation of 'us versus them', whereby scientists are attributed a malevolent authoritarian position, while 'we' are positioned within the category

of victimhood as sufferers of tyranny, manipulation and embezzlement (Davies & Harré, 1999). More specifically, the ‘rotten money-making scheme’ of scientists is represented as having negative implications for ‘us’, that is, laypeople. There is a collectivisation of ingroup victimhood vis-à-vis ‘them’ (Jaspal & Nerlich, in press). Crucially, the rhetorical processes of positioning and anchoring perform an important evaluative function, specifying the ‘good’ and the ‘bad’, the powerful and the weak.

There is an attempt to attribute credibility to the emerging polemic social representation of climate change as a (scientific *and* financial) ‘scam’ by undermining the contradictory hegemonic one. The verb ‘to prove’ contributes to this, as does the suggestion that, in disseminating information regarding climategate, *The Daily Mail* has defied the authoritarian tendency of the scientists to ‘suppress any dissent’. The newspaper is positioned alongside the public within the category of victimhood, since it is represented as benevolently ‘showing some guts’.

The rhetorical polarisation of ‘us’ versus ‘them’ constitutes an important means of establishing credibility for the polemic social representation of climate change as a ‘scam’. This is achieved partly by denigrating not only the scientists who are seen as being the primary disseminators of the hegemonic representations, but also the ‘believers’ who passively accept the representations:

(15) The climate change scam gets better and better, when will you believers WAKE UP to this, it is a SCAM nothing more or less we are being manipulated by scientists who if they do not agree with the climate change clap trap get their funding stopped [...] I believe you reap what you sow, it will cost the average person in the street very dearly indeed, this guy in the wildwest days would of [*sic*] been selling a tonic/elixir to cure all ills. I believe in protecting our environment but not telling porkies to do.

Extract 15 addresses ‘believers’ in the second-person narrative, which constructs an ingroup versus an outgroup, as described above. More specifically, ‘believers’ are constructed as being naive and unaware of the ‘climate change scam’ and are therefore urged to ‘wake up’ to the (constructed) reality of the ‘climate change scam’. It is noteworthy that the category ‘believer’ evokes connotations of religious belief and orthodoxy, suggesting uncritical acceptance and irrational conformity (Nerlich, 2010). This implicitly belittles those individuals who accept and endorse hegemonic social representations of climate change. Establishing the peripheral element that endorsing this representation will ‘cost the average person in the street dearly’ implicitly inculcates the ‘believers’ and negativises them. This peripheral element may be regarded as an elaboration of the peripheral element that climate science is financially motivated. Believers are rhetorically equated with those naïve enough to purchase expensive but useless miracle cures from quacks (scientists).

The negativisation of ‘believers’ constitutes an important rhetorical strategy for rejecting hegemonic representations of climate change. To reject this hegemonic representation is to express dissent and can potentially enhance one’s distinctiveness as a knower of ‘truth’; this has been referred to as negativism (Apter, 1983). Rhetorical negativism of this kind serves to redefine the rationale for hegemonic social representations of climate change and to re-attribute the contents of the representations to malevolent ulterior motives (e.g. greed). This *justifies* rejection of the representations, as illustrated in extract 16:

(16) Peter, Bournemouth, Your an stereo typical [*sic*] Envirofascist, You have to bring a debate about meat eating to an personal attack on others who do not conform to your own narrow mined [*sic*] view. And I also challenge you to provide an educated counter argument to what all the world leaders and scientists (You know the ones, Hacked emails spinning and tricks spring to mind) and now saying is what they believe is Climate

change/Global warming. Don't knock it, unless you can substantiate what you say, Of course If we could trust or believe these lying Tax grabbing world leaders, or these money grabbing grant taking scientists. And I did not even have to use the word moron once, Now that's an [sic] grown up debate for you m8ty

This comment was posted in response to an earlier comment from 'Peter, Bournemouth', which was supportive of hegemonic representations of climate change and averse to the emerging polemic representations of climate change as a 'scam'. The commentator positions 'Peter, Bournemouth' metaphorically in terms of an 'Envirofascist'. The objectification process of figuration imbues the position of accepting hegemonic social representations of climate change with a more 'concrete' culturally accessible essence (Moscovici & Hewstone, 1983). More specifically, it invites the perception of 'believers' as 'fascists', that is, authoritarian, aggressive and averse to debate. The point regarding fascist aversion to debate is implicitly reinforced through the commentator's claim that their comment constitutes a 'grown up debate' *vis-à-vis* the implied approach of 'Envirofascists' (see also extract 3). This infantilises scientists and environmentalists, who are portrayed as bullies. This point is echoed in extract 3, in which climate scientists are portrayed as childish. Anchoring the belief that climate change exists to 'Envirofascism' connects with the observed positioning of climate scientists as authoritarian (bullying) figures who stifle debate (see extract 14). The perceived disseminators of the hegemonic social representations are denigrated in terms of 'money grabbing grant taking scientists' and 'Tax grabbing world leaders'. The use of periphrastic adjectival constructions to qualify the categories 'scientist' and 'world leader' serves to anchor these categories to negative characteristics, making them cognitively inseparable (Jaspal, 2011). This provides acceptable social conditions for the outright rejection of hegemonic social representations of climate change, fostering an atmosphere of

climate scepticism and even denial. Most importantly, these comments attempt to undermine public trust in climate science, while at the same time upholding trust in an ideal image of science that, by contrast is honest, apolitical, and ‘unpolluted’ by money, that is, pure, proper and therefore ‘real’ as opposed to climate science, which, by contrast, is improper and impure, science.

DISCUSSION

This paper set out to examine the discursive aspects of social and political contestation of climate change in a small sample of reader comments on tabloid newspaper articles in the aftermath of the politically polarising climategate affair. This context-specific study is not intended to be empirically generalisable nor is it presented as representative of public attitudes concerning climate change. Rather, the aim was to identify and examine the rhetorical strategies, which may be employed by climate sceptics and deniers in order to *construct* particular versions (that is, social representations) of climate change; to *contest* alternative representations; and to *convince* others of the validity of one’s constructed version of climate change. The use of critical discourse analysis has allowed insight into the rhetorical dynamics in a discursive site characterised by social and political contestation of climate change. Therefore, it is believed that this study speaks to a broader range of issues surrounding discourse, rhetoric and argumentation (Billig, 1988; van Dijk, 1993).

It has been shown that commentators can employ a range of rhetorical strategies for challenging and rejecting hegemonic social representations of climate change. The analysis suggests that individuals seem to draw upon three overarching strategies for contesting these representations, namely (i) the denigration of climate science and climate scientists; (ii) the delegitimisation of pro-climate individuals by disassociating them from the domain of ‘science’; and (iii) the construction of a deception, financially-driven agenda of climate

science. An important sub-discourse intersecting these major strategies and linking them together was the rhetorical association of (i) science and money, and (ii) science and politics. Although the link between science and money and science and politics, especially in terms of financial and/ or political ‘scams’, had already been quite pervasive in earlier debates surrounding climate science, even at the height of climate consensus in about 2007 (Nerlich & Koteyko, 2009), our analysis suggests that climategate is deployed by commentators as ‘evidence’ for the assertion that climate science is primarily a money-making scam, that is, as a rhetorical resource for constructing their own assertions as ‘factual’, which in turn enables them to resist hegemonic social representations of climate science and climate change (Breakwell, 2010).

Critical moment in science

By exploring the discursive elements of social and political contestation of climate change it has been possible to provide some insight into how individuals respond rhetorically to hegemonic and polemic social representations of climate change. It seems that hegemonic representations can be difficult to reject entirely or to re-construe, as is the one that climate change is indeed occurring (Jaspal, Cinnirella & Nerlich, forthcoming). However, the representation can be challenged rhetorically by denigrating its disseminating *source*, namely climate scientists themselves. For instance, the category ‘scientist’ may be anchored to that of ‘politician’ and climate science may be objectified in terms of (illegitimate) financial gain, that is, a ‘scam’ (Moscovici, 1988). The analysis attests to the development of a competing polemic social representation of climate scientists, namely that they are untrustworthy in the domain of climatology. Given that science is typically understood as apolitical, fair and objective (Agazzi, 2004), the peripheral element that there is a financial dimension to climate

science is most effective in its support for and reinforcement of the polemic representation that climate scientists are untrustworthy.

However, not all commentators consensually denigrated the field of science. Climate sceptics may well acknowledge the positive values of science, such as its celebrated apoliticality, fairness and objectivity, but simultaneously engage in the rhetorical strategy of distancing pro-climate individuals from the positively evaluated domain of science. The primary difference between this strategy and that of denigrating science is that here science itself is not problematised or delegitimised. Rather, pro-climate individuals are delegitimised by virtue of their ‘distance’ from the (constructed) version of science (see Bar-Tal, 1990 for a detailed account of delegitimation). They are disenfranchised from the domain of ‘scientific issues’ such as climate change, which in turn undermines the social representations that they disseminate. For instance, by constructing climate change as a ‘creation’ of Al Gore, whose non-scientific background is emphasised in the strongest terms, the phenomenon of climate change is attributed almost entirely to a single non-scientific figure. Indeed, the discursive prominence of Al Gore in blog discussions and media representations (Höijer, 2011; Koteyko et al., 2010; Nerlich & Koteyko, 2009) has led to widespread personalisation (itself a sub-process of objectification) of climate change in terms of Al Gore. However, the *science*, which underlies climate campaigning, is obscured by the objectification of climate change in this way. Thus, the delegitimation of the personifying symbol (namely Al Gore) undermines the hegemonic representation itself.

Commentators extend their rhetorical delegitimation of pro-climate individuals to climate scientists, rather than just climate campaigners such as Al Gore. This can be achieved by providing superfluous and irrelevant information regarding particular climate scientists (van Dijk, 1991). For instance, Dr Pachauri is positioned as ‘just an (Indian) engineer’, emphasising his Indian background, which is irrelevant in the particular context. This implies

some sort of pretence and the individual's consequential 'ineligibility' to communicate climate science. Commentators undermine these pro-climate individuals' efforts at making or advising on climate change policy by dismissing their *legitimate* associations with science. Moreover, the analysis exhibits an underlying (hegemonic) social representation that dissociates (pure or proper) science from money and therefore claims that any contact between science and money renders science immediately improper. Thus, commentators can strategically make use of this hegemonic representation regarding the 'purity' of science (Agazzi, 2004), in order to encourage and 'hegemonise' their own polemic social representations that (i) climate change itself constitutes a money-making scheme rather than a scientific reality, and that (ii) mainstream climate science is essentially 'not real' science (Jaspal & Yampolsky, 2011). In essence, this serves to undermine the hegemonic social representation that anthropogenic climate change exists as an environmental problem.

Climategate as a rhetorical resource

It seems that climategate may even rhetorically empower relevant stakeholders to deny climate change in its entirety and to thereby *reject* hegemonic representations of climate change. Whether the 2012 'deniergate', precipitated by a batch of leaked emails allegedly showing how a climate sceptic think-tank manipulated public discourse around climate change (Thorpe, 2012), might lead to a process of disempowerment remains to be seen. The analysis demonstrates that climate scientists may be depicted as the malevolent, dictatorial and antagonistic 'Other', while the ingroup (namely, climate sceptics and the general public at large) are positioned within the category of victimhood (Davies & Harré, 1999). This form of positioning creates and nurtures ingroup and outgroup social identities on the basis of accepting and rejecting hegemonic social representations of climate change (Breakwell, 1993). By invoking climategate, commentators may construct (i) their polemic social

representation that climate change simply does not exist as ‘factual’ and (ii) pro-climate individuals as naive ‘believers’. This is achieved by anchoring the acceptance of climate science to religious conviction (Moscovici, 1988), which has been observed as one means of delegitimising the claims of climate scientists in previous metaphor analysis studies (Nerlich, 2010; McKeown, 2012). Linking these two observations, commentators may also generalise the ‘malevolence’ of climate scientists to members of the general public or non-scientific community who accept hegemonic representations of climate change by objectifying their ideas in terms of constructing them as bullies. In unison, these rhetorical strategies essentially stigmatise acceptance of these hegemonic representations of climate change and undermine support for them (McCright, 2007).

The paper provides insight into a discursive ‘struggle’ around (climate?) science. Rhetorical resources such as climategate may allow individuals to construct science as ‘faulty’ and untrustworthy, or it may be employed to show that pro-climate individuals are not ‘real’ scientists. Notions of science and scientific knowledge are deployed rhetorically in order to construct particular representations of climate change, to contest and resist hegemonic representations and to convince others of the validity of polemic representations.

Social representations in text

The paper makes a theoretical contribution to a growing tradition of research into the use and development of social representations in text (e.g. Höijer, 2011; Jaspal & Nerlich, in press; Olausson, 2009). It has been shown that a hegemonic social representation can be undermined by challenging its peripheral elements, whose primary function is to support the ‘core’ of the representation (Abric, 2001). The peripheral elements may be undermined by strategically invoking a competing polemic social representation (Ben-Asher, 2003). The

hegemonic representation is undermined due to the consequential disruption caused to the relationship between the ‘core’ of the representation and its relevant peripheral elements.

This paper echoes the observation that, in contexts of intergroup conflict, traditionally less ‘powerful’ stakeholders will attempt to ‘upgrade’ their polemic social representations to hegemonic level (Jaspal & Yampolsky, 2011), partly because this can serve the ingroup’s goals and ambitions (Breakwell, 1993). Through the use of critical discourse analysis (van Dijk, 1993), we have been able to show that commentators may attenuate power differentials between scientist and layperson, implicitly encouraging readers to take a favourable stance on their polemic social representations which challenge anthropogenic climate change and/ or climate science. Crucially, the attenuation of power differentials can perform a ‘hegemonising’ function vis-à-vis the polemic representation, since it constructs the less powerful group as knowledgeable and hence fully capable of disseminating information regarding climate change.

Conclusion

This paper encourages a critical examination of how climate sceptics and deniers talk and argue about climate change in the diverse and complex social representational field and ‘battlefield of knowledge’ of social media. Reader comments in our sample generally aimed to delegitimise and undermine climate science. There was an aim to associate climate science and climate scientists with perceived negative attributes of politics and politicians (lying, cheating, money grabbing), and to dissociate climate science from the constructed positive attributes of science (honesty, truth, objectivity). This paper argues that the notion of science and the process of science communication face a critical moment, since they may be problematised and delegitimised in order for relevant stakeholders to resist hegemonic social representations of climate change. Crucially, it has been shown that climate sceptics and

deniers do not simply delegitimise climate science without ‘evidence’. Rather, they make strategic use of contextual factors and emerging social representations, such as climategate in order to substantiate and ‘hegemonise’ their polemic representations, lending them further credibility in the eyes of others. More generally, research into science communication must continue to examine the influence and impact of the volatile social context in which science is deeply embedded, in order to optimise science communication and to engage with the socio-environmental problem of climate change.

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