

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

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This study examines the rhetorical aspects of social contestation of climate change in reader comments published in *The Daily Mail*, subsequent to climategate. The following themes are reported: (1) Denigration of climate scientists to contest hegemonic representations; (2) Delegitimization of pro-climate change individuals by disassociation from science; (3) Outright denial: Rejecting hegemonic social representations of climate change. The study outlines the discursive strategies employed in order to *construct* social representations of climate change; to *contest* alternative representations; and to *convince* others of the validity of these representations. It examines how social representations of science are formed, maintained and disseminated.

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

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Climate change has become one of the most pressing global challenges for science, society and science communication. Campaigners have stepped up efforts to encourage engagement with climate change (Crompton & Kasser, 2010), while some groups of so-called climate skeptics or deniers have mobilized in order to expose the perceived inaccuracies of climate science (Mann, 2012; Montford, 2010). The debate about climate change and climate science is carried out mainly in the traditional media and in the cybersphere, but also in intermediate spaces, such as online reader comments left after the publication of articles about climate change in major newspapers.

In order to understand the diverse public responses to climate change, social scientists have turned their attention to analyzing the content and communicative strategies of major channels of societal information, particularly the news media. This tradition of research examines trends in media reporting (Boykoff, 2011; Brulle, Carmichael & Jenkins, in press; Jaspal & Nerlich, in press). However, there has been little attention to the laypeople's talk and text about climate change in the media sphere. In this paper, we argue that the field of science communication can benefit from the systematic analysis of user-generated content, in this case online reader comments on media reporting of climate change. This paper examines the legacy of the 2009 "climategate" affair on public perception of climate science and science as expressed in a small sample of reader comments, using a mixed methods approach.

The term "climategate" is commonly used to refer to the online release of thousands of emails and other documents from the University of East Anglia's Climatic Research Unit in November 2009 (Nerlich, 2010). Some critics of the theory of anthropogenic (or human-induced) climate change used the contents of these emails to challenge mainstream climate science and to accuse scientists of dishonesty and fraudulent tactics to sideline certain types of research. The Climatic Research Unit scientists were subsequently cleared of wrong-doing in various inquiries. However, climategate has continued to have a discernible impact on public trust in climate science (Leiserowitz, Maibach, Roser-Renouf, Smith & Dawson, in press) and has also sparked a debate about the norms and ethical behavior of climate

scientists (Grundmann, 2012, in press). In this paper, we examine the rhetorical aspects of readers' comments triggered by the climategate affair and the ways that climategate provided lay people with new ways of thinking and communicating about science in general and climate science in particular.

Social Representations Theory

This study is concerned with how readers respond rhetorically to the issue of climate change, complementing existing research into cognitive, and particularly attitudinal, responses (Leiserowitz, 2006). To study the rhetorical aspects of the reader comments we use both social representations theory as theoretical tool and critical discourse analysis as a methodological one. Social representations theory aims to study 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). A social representation is defined as "a system of values, ideas and practices" regarding a given social object (Moscovici, 1973, p. xiii; Moscovici, 1988), as well as "the elaborating of a social object by the community for the purpose of behaving and communicating" (Moscovici, 1963, p. 251). Social representations emerge within a particular context and within particular social groups and create what one might call a shared social reality in which discussion of issues such as climate change can take place (Billig, 1988).

In his analysis of how representations are formed, Moscovici (1988) outlines two processes that structure the emergence of particular social representations, namely *anchoring* and *objectification*. Anchoring refers to the process of making something unfamiliar understandable by linking it to something familiar (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. 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 "materializing" the immaterial. For example, using social representations theory, Olausson (2011) has shown that visual representations of polar bears and flooding can come to function as "evidence" of climate change.

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 evolving contexts, while peripheral elements are organized around the core, and provide it with context. They serve to “concretize”, adapt and defend the central core, rendering it intelligible and communicable. New incoming information can be incorporated into the representation in the form of peripheral elements. Previous social representations work has not examined these structural elements of social representations of climate change. This paper, by contrast, provides insight into the structure of emerging representations of climate change and how structural factors contribute to the social and political contestation of climate change in reader comments.

Social representations are shared and accepted by individuals to differing degrees (Moscovici, 1988). According to Social Representation Theory, *hegemonic* social representations are shared consensually by members of a group; they are coercive and relatively uniform. In Western European countries, hegemonic representations concerning climate change construct it, on the whole, as (1) a genuine, serious environmental problem which requires mitigation; and (2) caused largely by human/industrial activities (Olausson, 2010). Conversely, *polemic* representations are generated in the course of social conflict and are characterized by antagonistic relations between groups. Typically, polemic representations challenge or contest hegemonic representations. In Western European societies, polemic representations construct climate change as (1) a “naturally-induced” environmental phenomenon which cannot be mitigated against; or (2) a non-existent “scam” perpetrated by government, scientists and other institutions for financial and/or political reasons (Nerlich & Koteyko, 2009).

In the British context at least, print and online media constitute important “discursive sites” within which hegemonic and polemic social representations of climate change are regularly created, disseminated and contested (Boykoff, 2011). Carvalho (2007, p. 224) remarks that, “[a]s a forum for the discourses of others and a speaker in their own right, the media have a key part in the production and transformation of meanings.” Accordingly, the press has been described in terms of a “battlefield of knowledge” (Boykoff, 2009, p. 340). It performs an agenda-setting function, providing laypeople with social stimuli for thinking and talking about climate change.

The Construction and Contestation of Climate Change

Climate change has been described as one of the most politicized scientific issues attracting abundant media coverage (Deming, 2005). While mainstream press coverage has been

examined extensively (Boykoff, 2009, 2011; Carvalho, 2007), online debates and representations of climate change have not yet been studied in detail (Brulle et al., in press; Porter & Hellsten, 2011; Valdez, Nerlich & Koteyko, 2012).

Using both print and online media, climate campaigners and climate skeptics/deniers have each disseminated their respective social representations of climate change to the general public, creating "ripples" in public perceptions 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 skepticism has increased from 4% in 2005 to 15% in 2010 (Poortinga, Spence, Whitmarsh, Capstick & Pidgeon, 2011). These data seem to indicate that antagonism between what one may loosely call the two camps, especially prominent in the US since climategate (Brulle et al., in press; Nerlich, 2010; Painter, 2010), may have influenced public understanding of climate change, potentially resulting, at least for a while, in a decline in public trust in climate science, as well as increased skepticism concerning the impact and even existence of climate change.

Climategate provided some climate skeptics with an opportunity to represent climate science as faulty, fraudulent and even a "scam", a social representation that had already been present before (Nerlich & Koteyko, 2009), but now seemed to be based on "evidence" revealed in the emails between climatologists. In this paper we examine how *consumers*, rather than producers of media reports, talk about climate change in the aftermath of the climategate affair and how they use this new "evidence" rhetorically and argumentatively (Anderson, 1997).

Research into reader comments is still in its infancy, although the value of user-generated discursive material has led to studies of reader responses to BBC news articles concerning avian influenza (Rowe, Hawkes & Houghton, 2011), online comments on YouTube videos concerning climategate (Porter & Hellsten, 2011), and indeed a corpus-assisted study of reader comments after climategate (Koteyko, Jaspal & Nerlich, in press). These studies support the argument of Richardson and Stanyer (2011, p. 984) that the systematic analysis of reader comments is essential if "we are to move away from optimistic speculation [regarding the impact of news reporting for public thinking] and build a fuller picture of the expression of reader opinion in the online environment." Reader comments provide an ideal case study for the examination of the rhetorical aspects of social and political contestation, since (1) they can be anonymous; (2) there is scope for interaction between commentators, providing insight into argumentation; (3) they have the potential to influence others' comments; and (4) they may reflect more widely distributed social representations and collective beliefs particular to at least a subsection of the British public. Reader

engagement is an important area of investigation primarily because it complements existing analyses of media representations of climate change. It can provide insights into the *uses* of (media-generated) social representations of climate change among laypeople, and, in particular, how media representations are taken up and transformed in the social domain (that is, in layperson discourse).

This paper examines the rhetorical aspects of social and political contestation of climate change within these discursive sites, subsequent to a politically polarizing event such as climategate. The aim is to reveal the discursive strategies employed by laypeople 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. Theoretically, these aims reflect the concern in social representations theory with how social representations are formed, maintained and disseminated (Breakwell, 1993)

METHOD

Most national newspapers in the UK now provide space for online reader comments. For this paper we chose a British tabloid newspaper, *The Daily Mail*, because it is one of the three biggest selling newspapers in Britain (which are *The Sun*, *The Daily Mail* and *The Daily Mirror*). Of the three, only *The Daily Mail* website database contained a sufficiently large number of reader comments, providing a corpus of data suitable for corpus-assisted critical discourse analysis (see below). Although our focus on one newspaper outlet does not allow us to make more generalizable statements regarding general tabloid reader engagement with climate change, a key advantage of this smaller-scale, though in-depth, case study approach is that it provides detailed, nuanced and contextually sensitive insights into comments provided in this clearly very influential tabloid. Our qualitative analysis complements quantitative research in this area (Koteyko, Nerlich & Jaspal, in press).

We focused on reader comments on articles published on *The Daily Mail* website (www.thedailymail.co.uk) in a one-year period, from January 1 to December 31, 2010. The search term "climate change" generated 355 news articles, and these 355 articles attracted 4698 reader comments in total. The term "reader comment" refers to each single text entry posted on the newspaper website in response to a given news article. These varied in size – while some entries consisted of a few words, others contained several sentences. This sampling period was deemed appropriate, as it provided some temporal distance from climategate (which occurred in November 2009). By January 2010 the issue had begun to "settle" in the media sphere, albeit becoming part of social thinking on climate change

(Nerlich, 2010), and therefore provided a potentially less polarized debate than in the immediate aftermath of climategate. As noted, this sampling procedure provided 4698 comments, which enabled us to conduct a combined quantitative and qualitative analysis. Koteyko, Jaspal and Nerlich (in press) present the analysis of frequent lexical patterns found in the whole corpus with the help of the lexical analysis software WordSmith Tools (Scott, 2011)¹, whereas this paper deals with a qualitative critical discourse analysis of a sub-corpus. Specifically, the analysis below is based on a sub-corpus of comments where two of the most frequent content² words in the whole corpus – the words “science” and “scientist/s” – were used (in total 1907 comments). As a high frequency of word use may be indicative of the popularity of certain topics (in this case, discussions to do with climate science), we decided to explore these comments in more detail as a potential source of social representations and as indicators of changes in how lay people communicate about science. In this way, the decision to focus on the comments containing the words “science” and “scientist/s” was driven by the fact that these two words occur with the highest frequency among the content words in a given collection of comments.

Analytical approach

This paper presents a fine-grained critical discourse analysis of reader comments (van Dijk, 1991, 1993). This method 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. At the micro level, critical discourse analysis allows the analyst to examine the impact of particular lexical items, syntax, and rhetorical techniques (e.g. use of metaphor) for meaning production. For example, Nerlich (2010) has found that the metaphor of “religious preaching” was used by climate skeptics in order to describe climate science communication. This essentially served to attach negative meaning to climate science. At a macro level, there is scope for exploring inter-textual understanding, that is, how broader social representations (e.g. associated with climategate) can in turn impinge upon meaning production in text. For instance, one would expect adjectival constructions (used in relation to climate scientists) such as “money-grabbing” and “dishonest” to resonate with readers given that climategate was pervasively regarded as evidencing a malicious “plot” by scientists (Montford, 2010). In short, critical discourse analysis recognizes that there is a reciprocal relationship between macro-level social representations and micro-level text. The patterns of meaning identified in critical discourse analysis are represented as “discourses”. The method provides insight into how “reality”, as we understand it, is constructed (rather than reflected) in talk and text. Thus, we are not looking for an “objective” reality, but rather the discursive resources (e.g.

metaphor, argument) that are employed in order to construct it (Burr, 2003). This analytical approach acknowledges the possibilities offered by, and potential constraints imposed by, social power relations (van Dijk, 1993). It helps to reveal the rhetorical strategies for affirming and contesting hegemonic and polemic representations.

Procedure

The subcorpus of 1907 comments containing the words ‘science’ and ‘scientist/s’ were initially read repeatedly by the first two authors in order to for them to acquire a high level of familiarity with them and to facilitate in-depth discussion. The right margin was used to note initial observations which captured essential qualities (i.e. overall substantive points being made), units of meaning (e.g. evaluative aspects) and apparent rhetorical techniques (e.g. use of metaphor) within the data. The authors discussed their respective initial codes, which included *inter alia* the general tone of the comment (e.g. irony, sarcasm), particular forms of language (e.g. metaphor), comparisons, categorizations and emerging patterns (e.g. recurrent use of irony/certain metaphors) in the data. The authors discussed potentially idiosyncratic interpretations of the data until consensus was reached. These initial codes were collated into preliminary discursive themes, which captured the essential qualities of the comments analyzed. There were 14 preliminary themes, such as: (1) “Lying as an inherent quality of climate scientists”; (2) “Constructing a suitable position for contesting climate science”; (3) “Accentuating the perceived financial benefits of climate change”; (4) “Carbon taxes as a source of income”; (5) “Malicious collusion of science and politics”; (6) “Victimhood of laypeople”; (7) “Rhetorical infantilization of scientists”; (8) “Attribution of climate science expertise to non-scientists”; (9) “Attribution of authoritarianism to climate science”; (10) “Accentuating the uncertainty of climate science”; (11) “Re-constructing the criteria for contributing to the climate debate”; (12) “Anchoring climate science to scam”; (13) “Using climategate as an explanation”; and (14) “Highlighting the ‘purity’ of science.” These 14 themes were arranged into a coherent narrative structure, which best reflected the analysis of the reader comments. This process resulted in the identification of three superordinate discursive themes, which are presented in the analysis section below. For instance, preliminary themes 1, 3, 8 and 11 (above) were merged together, given that the analysis revealed substantive and theoretical overlap between them, in order to construct the superordinate theme “Delegitimization of pro-climate change individuals by disassociation from science.” In addition to identifying the substantive themes prevalent in the corpus of reader comments, we examined the rhetorical functions (e.g. delegitimization, denial) that seemed to be performed by the initial codes which we identified. More specifically, critical

discourse analysis enabled us to examine the performative functions of language use (that is, to understand not only the meaning of the comments but the ways in which they might support or give rise to certain types of social action). The vast majority of the initial codes fitted cohesively within the three superordinate themes outlined in the analysis.

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 an environmental issue (see Rose, Efrain, Gervais, Joffe, Jovchelovitch & Morant, 1995). Thus, extracts from the comments are selected in order to make overarching theoretical points, rather than to reflect general numerical tendencies across the data set. Although our analysis accurately reflects the dominant themes that addressed our research aims, we could only select a small number of extracts as illustrations of the discussion of substantive and theoretical points in this paper. Thus, while our critical discourse analysis is based on the analysis of 1907 comments, we present only a small number of illustrative quotes.

In the extracts presented below, three dots indicate where material has been excised; and other material within square brackets is for clarification. Information regarding the sources of reader comments (i.e. titles of news articles that provoked particular comments and their publication dates) is included in the endnotes.

ANALYSIS

The following superordinate themes are discussed: (1) “Denigration of climate scientists to contest hegemonic representations”; (2) “Delegitimization of pro-climate change individuals by disassociation from science”; and (3) “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 delegitimize the “science” upon which hegemonic social representations of climate change are based; that is, the mainly dominant view of climate change as being exacerbated by the production of greenhouse gases (including carbon dioxide) emitted by human activity. This over-arching delegitimizing process enabled commentators to contest, though not necessarily to reject in its entirety, the social representation that climate change is occurring (and man-made). 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.^{3,4}

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 (Breakwell, 1993). However, the same commentator seizes the opportunity to delegitimize 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... 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!⁵

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 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 “our money”, rather than an environmental one. 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, it is argued, have “not been completely honest with their research.” Indeed, the anchoring of science to politics was observable in the whole corpus of comments, 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 will YOU personally swallow?... 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.⁶

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 feces; lies) are generalized 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), it is also rhetorically positioned as childish, in the sense of a child fabricating a world through something like pretend-play. This construction of climate science as political and childish scheming is contrasted with a very traditional image of science as purveyor of authoritative truth (Agazzi, 2004), which is not contested.

Hegemonic representations of climate change can also be challenged by contesting the legitimacy of the *source* of these representations (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 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 is, don't feel intimidated by someones title, just because they might have learned more about a particular subject does not mean they are smarter... Most papers have money and an agenda behind them, just because its written by a “scientist” doesn't mean its not intended to be misleading (even if its technically accurate)⁷

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. 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 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 an additional peripheral element, namely that scientists can actively intend their scientific papers to be “misleading”, since there is a financial “agenda” (which links this representation to the representation of political corruption of science). The peripheral elements that (1) in “real terms” there are few differences between scientists and laypeople; (2) there are financial incentives for the publication of deliberately misleading science, collectively, construct a delegitimizing social representation of climate scientists as untrustworthy. Furthermore, having attenuated power differentials between scientist and layperson, readers are implicitly encouraged to take a favorable stance on this delegitimizing representation of climate science. This performs a “hegemonizing” function vis-à-vis the representation.

The second peripheral element of this delegitimizing 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.⁸

(6) Why are the police not questioning the “scientists” putting out false information supporting global warming?⁹

(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.¹⁰

In response to an article describing Prince Charles’ criticism of what he called the “appalling treatment” of scientists working at the University of East Anglia (that is the way their work was attacked by some climate skeptics after the release of the scientists’ personal emails), the author of extract 5 constructs a rationale and justification of this treatment by invoking “false research,” lies and hypocrisy. As in extract 2, an implicit distinction is drawn 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 extracts 6 and 7 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 behavior. 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 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 is socially represented as inherently fraudulent and subservient to politics and finance (greed).

Delegitimization of pro-climate change individuals by disassociation from science

Several 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 collapsing and would cause world ruin if we did not pass laws to protect the Ozone... Gore is not the Scientist he pretends.¹¹

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 constructs it in terms of a scheme to “gain hundreds of millions of dollars.” Again, there seems to be an underlying 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 depicted 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 (also see extract 8). The commentator constructs climate change and ozone depletion as the

exclusive domain of scientists, from which Al Gore is rhetorically excluded. 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 delegitimize the categories “science” or “scientist” *per se*, but rather distances pro-climate change individuals from this domain. In the next extract, a scientist is delegitimized by being positioned as “just an (Indian) engineer.” Like extract 8, this also implies some sort of pretence. In both cases the efforts of pro-climate change individuals 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.¹²

The commentator in extract 9 begins by acknowledging the hegemonic representation that the climate is changing, while emphasizing 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 constructs a growing “culture” of lies surrounding climatology. Climategate serves as an important rhetorical anchor and is implicitly linked to “glacier-gate,” which seemed to provide further “evidence” for lying and cheating by climate scientists (Walsh, 2010).

The commentators lend credibility to their social representational position by delegitimizing the disseminator of these “lies.” Extract 9 refers to Dr Rajendra Pachauri (the former chairperson of the Intergovernmental Panel on Climate Change) not in terms of his 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 (see also Carvalho, 2007). The adjective “some” constructs him as an unknown, interchangeable figure. The invocation of the scientist’s ethno-national background renders this category more salient than the one of “scientist,” potentially activating images of foreignness and ineligibility to make scientific assertions. Similarly, 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 delegitimization 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 (which contrasts with the appeal to laypeople's expertise in extract 4). Here too vested business interests, financial incentive and bureaucratic greed exemplify the (professional) distance of pro-climate change individuals from the domain of science. Crucially, it is not the domain of science that is problematized, 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 10, 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"):

(10) 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.¹³

The commentator re-categorizes hegemonic 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 legitimizes 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 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.” The overarching aim here is to delegitimize climate scientists.

Outright denial: *Rejecting* hegemonic social representations of climate change

Climategate may rhetorically empower individuals 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:

(11) 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.¹⁴

The “big scam” of “man-made global warming” is constructed as common-sensical knowledge, which people should now “realize.” 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 is again the rhetorical anchor that commentators use to undermine, denigrate and reject climate 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 (Abric, 2001). This essentially attributes meaning to the polemic representation, lending it further credibility and providing scope for its “hegemonization” (Jaspal & Yampolsky, 2011).

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

(12) 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.¹⁵

In extract 12, 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 polarization 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). The “rotten money-making scheme” of scientists is represented as having negative implications for “us,” that is, laypeople. Accordingly, there is a collectivization of in-group victimhood (Jaspal & Nerlich, in press). The rhetorical processes of positioning and anchoring perform an important evaluative function, specifying the “good” and the “bad,” the powerful and the weak.

The rhetorical polarization of “us” versus “them” establishes credibility for the polemic representation of climate change as a “scam.” This is achieved partly by denigrating not only the climate scientists who are seen as the primary disseminators of the hegemonic representations, but also the “believers” who passively accept the representations:

(13) 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... it will cost the average person in the street very dearly indeed.¹⁶

Extract 13 addresses “believers” in the second-person narrative, which constructs an in-group versus an out-group, 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.” The category “believer” evokes connotations of religious belief and orthodoxy, suggesting uncritical acceptance and irrational conformity. This implicitly belittles those individuals who accept and endorse hegemonic representations of climate change. Establishing the peripheral element that endorsing this representation will “cost the average person in the street dearly” inculcates the “believers”

and negativizes them. This peripheral element may be regarded as an elaboration of the peripheral element that climate science is financially motivated. The negativization 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 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 14:

(14) Your an stereo typical Envirofascist, You have to bring a debate about meat eating to an personal attack on others who do not conform to our own narrow mined 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.... Of course If we could trust or believe these lying Tax grabbing world leaders, or these money grabbing grant taking scientists.¹⁷

This comment was posted in response to an earlier comment from a reader, which was supportive of hegemonic representations of climate change and critical of the emerging polemic representations of climate change as a “scam.” The commentator positions this reader metaphorically in terms of an “Envirofascist.” This provides those holding hegemonic representations of climate change with a “concrete” culturally accessible identity and thereby “objectifies” them (Moscovici & Hewstone, 1983). It invites the perception of “believers” as “fascists,” that is, authoritarian, aggressive and averse to debate. This point is reinforced through the commentator’s claim that their comment constitutes a “grown up debate” compared to the implied approach of “Envirofascists.” This infantilizes scientists and environmentalists, who are portrayed as bullies (see also extract 3). Anchoring the belief that climate change exists to “Envirofascism” connects with the positioning of climate scientists as authoritarian (bullying) figures who stifle debate (see extract 12). 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 then provides acceptable social conditions for the outright rejection of hegemonic social representations of climate change. Most importantly, these comments

attempt to undermine public trust in climate science, while at the same time upholding trust in an ideal (albeit crude) image of science that, by contrast, is honest, apolitical, and “unpolluted” by money.

DISCUSSION

This paper examines the discursive aspects of social and political contestation of climate change in a small sample of reader comments on tabloid articles published in the aftermath of climategate. This context-specific study is not intended to be empirically generalizable or representative of public attitudes concerning climate change. Rather, the aim is to identify and examine, using critical discourse analysis, the rhetorical strategies, which may be employed by readers of *Daily Mail* articles on climate change 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. Moving beyond the analysis of political rhetoric, media reporting and other forms of planned speech (Boykoff, 2011; Weingart, Engels & Pansegrau, 2000), this paper demonstrates the discursive strategies that laypeople can draw upon in the aftermath of climategate (van Dijk, 1993). Moreover, the results provide preliminary insight into how social representations of science, more generally, are developing in a context of heightened suspicion of climate science, in particular.

The findings reinforce Carvalho’s (2007, p. 224) observation that “[s]cientific knowledge is also utilized by a number of other social actors, including business and activists, to justify particular programs.” Accordingly, commentators can employ a range of rhetorical strategies for challenging and rejecting hegemonic social representations of climate change in particular and science in general. The analysis suggests that individuals seem to draw upon three overarching strategies for contesting these representations, namely (1) the denigration of climate science and climate scientists; (2) the delegitimization of pro-climate change individuals by disassociating them from the domain of science; and (3) the construction of a deception, financially driven agenda of climate science. Such strategies have always been available, but the climategate scandal provided material that could be used to create legitimacy for the use of such strategies.

An important sub-discourse intersecting with these major strategies and linking them together was the rhetorical association of (1) science and money, and (2) 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 pervasive in earlier debates surrounding climate science, even at the height of what one may call 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 indeed a money-making scam. Climategate is a rhetorical resource for constructing one’s own assertions as “factual,” which in turn enables one to resist hegemonic representations of climate science and (anthropogenic) climate change.

Critical moment in science and science communication

This paper shows how individuals may respond rhetorically to hegemonic and polemic representations of climate change. Hegemonic representations of climate change (as occurring and man-made) can be difficult to reject entirely or re-construct. This may be attributed to the long-standing social value of respect for science and scientists (Irwin, 1995). However, a hegemonic representation can be challenged rhetorically by denigrating its disseminating *source*, namely climate scientists themselves (Jaspal & Cinnirella, 2010). 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). This enables readers to construct a competing polemic representation of climate scientists as untrustworthy and/or unscientific.

Not all commentators consensually denigrated the field of science. Some commentators 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 change 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 problematized. Rather, pro-climate change individuals are delegitimized by virtue of their “distance” from the (constructed) version of science (see Bar-Tal, 1990). They are disenfranchised from the domain of “scientific issues” (e.g. 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 emphasized 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; Nerlich & Koteyko, 2009) has led to widespread personalization (itself a sub-process of objectification) of climate change. The *science*, which underlies campaigns calling for action against climate change, is obscured by the objectification of climate change in this way. The delegitimization of the personifying symbol (namely Al Gore, but also Dr. Pachauri) undermines the hegemonic representation itself. This is consistent with Carvalho’s (2007, p. 238) observation that recent media

reporting of climate change exhibits a tendency to “de-authorize the agents and institutions that call for citizen and political mobilization to address climate change.”

Climategate as a rhetorical resource

While Carvalho’s (2007) work focuses largely on the media’s use of uncertainty in order to delegitimize climate science, we show how climategate has rhetorically empowered *laypeople* to deny climate change in its entirety and to reject hegemonic representations of climate change (which are associated with heightened degrees of certainty about the causes and consequences of climate change). The analysis demonstrates that climate scientists may be depicted as the malevolent, dictatorial and antagonistic “Other,” while the in-group (namely, climate skeptics and the general public) are positioned within the category of victimhood (Davies & Harré, 1999). This form of positioning creates and nurtures in-group and out-group social identities on the basis of accepting and rejecting hegemonic representations of climate change (Breakwell, 1993).

By invoking climategate, commentators may construct (1) their polemic representation that climate change simply does not exist as “factual” and (2) pro-climate change individuals as naive “believers.” This is achieved by anchoring the acceptance of climate science to religious conviction, which has been observed as one means of delegitimizing the claims of climate scientists (Nerlich, 2010). Linking these two observations, commentators may also generalize the “malevolence” of climate scientists to members of the general public who accept hegemonic representations of climate change. In unison, these rhetorical strategies essentially stigmatize 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. Carvalho’s (2007) work alludes to this discursive struggle in the press, particularly in relation to the (mis-)use of scientific uncertainty. This paper shows how, post-climategate, a broader range of rhetorical resources can be popularly deployed in order to contest science and scientific assertions specifically in the discourse of lay readers. 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).

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 weakened by strategically invoking a competing polemic social representation (Ben-Asher, 2003). The hegemonic representation is contested due to the consequential disruption caused to the relationship between the “core” of the representation and its relevant peripheral elements. More specifically, the peripheral element is no longer able to provide support or “evidence” for the “core” due to its active contestation, which results in a consequential weakening of the hegemonic social representation.

This paper echoes the observation made in other contexts that, in circumstances 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 in-group’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 favorable stance on their polemic representations which challenge anthropogenic climate change and/ or climate science. The attenuation of power differentials can perform a “hegemonizing” 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.

This paper argues that the notion of science and the process of science communication face a critical moment, since they may be problematized and delegitimized by individuals who seek to contest hegemonic representations of climate change. It has been shown that climate skeptics and deniers do not simply delegitimize climate science without “evidence.” Rather, they make strategic use of contextual factors and emerging representations, such as climategate, in order to substantiate and “hegemonize” their polemic representations.

This study contributes to an emerging body of work that highlights the importance of considering user-generated content. Future research should consider other forms of user-generated content such as comments on social networking sites (e.g. Facebook, Twitter, YouTube), which would allow analysts to examine the use and contestation of social representations within particular social groups (e.g. environmental and other social movements) and in other settings. Further systematic research in this domain could enable analysts to develop a typology of language and rhetoric employed in order to construct and contest social representations of climate change and to convince others of their validity. Research into science communication should continue to examine the influence and impact of

the volatile social context in which science is embedded, in order to optimize science communication and to engage with the socio-environmental problem of climate change.

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¹ The WordSmith tools software calculates the frequency of all words in a given corpus, and then arranges them in a list, with the most frequent words displayed in the top.

² Linguists divide the vocabulary of English into two categories: function or grammatical words (such as prepositions and pronouns) and content words (e.g. verbs, nouns, adjectives).

³ We reproduce all reader comments verbatim, without correcting lexical or grammatical errors. Three dots indicate where material has been excised.

⁴ Ryanair boss Michael O'Leary says global warming doesn't exist, *The Daily Mail*, September 10, 2010.

⁵ Ryanair boss Michael O'Leary says global warming doesn't exist, *The Daily Mail*, September 10, 2010.

⁶ Head of 'Climategate' research unit admits sending 'pretty awful emails' to hide data, *The Daily Mail*, March 2, 2010.

⁷ Climategate U-turn as scientist at centre of row admits: There has been no global warming since 1995, *The Daily Mail*, February 14, 2010.

⁸ Prince Charles criticises 'appalling treatment' of Climategate scientists, *The Daily Mail*, December 4, 2010.

⁹ Police question global warming 'sceptic' scientist over 'Climategate' email leak, *The Daily Mail*, February 5, 2010.

¹⁰ Climategate team were 'guilty of sloppiness - NOT cheating', *The Daily Mail*, April 14, 2010.

¹¹ Scientists broke the law by hiding climate change data: But legal loophole means they won't be prosecuted, *The Daily Mail*, January 28, 2010.

¹² Putting a baa on burping sheep in the battle against climate change, *The Daily Mail*, January 18, 2010.

¹³ Prince Charles criticises 'appalling treatment' of Climategate scientists, *The Daily Mail*, December 4, 2010.

¹⁴ Could we be in for 30 years of global COOLING?, *The Daily Mail*, January 11, 2010.

¹⁵ Could we be in for 30 years of global COOLING?, *The Daily Mail*, January 11, 2010.

¹⁶ Secretive and unhelpful. But scientist in Climategate storm STILL gets his job back, *The Daily Mail*, July 8, 2010.

¹⁷ The red meat diktat: Eat less of it to help planet, says minister (who just happens to be a vegetarian), *The Daily Mail*, January 4, 2010.