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Climate change and the ecological crisis

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Abstract:

Termed as the greatest challenge humanity is faced with, climate change poses key questions to current societies and generates discursive struggles that link science, economics, politics, ethics and other realms in various arenas. Focusing on those different discursive battlegrounds, this chapter advances the argument that climate change has become increasingly depoliticised as techno-managerial approaches gain currency and many sectors of society are impeded from shaping the meaning of the issue and from co-constructing our common future.

Keywords: climate change; science; politics; media; techno-managerialism; ecological modernization; depoliticisation

A discursive outlook at climate change

Discourse analytical research on climate change is not only fully justified but badly needed. Proposing and deciding what this ‘wicked issue’ is about and what ought to be done about it involves discursive struggles among a range of social actors in science, politics, business, civil society, and other domains. Values, worldviews and ideologies, as well as multiple forms of power, are deeply interconnected with meaning-making practices on climate change. Discourse-minded academics thus have a responsibility in contributing to identify, analyse and expose the ways in which debates are often managed and distorted, and how that connects to issues of power and justice.

Humanity has never been faced with an environmental crisis of the type and scale of climate change. Deeply embedded in structures and practices that are central to current societies, it is tied in multiple ways to other issues, such as loss of biodiversity, deforestation and desertification. The transformations brought about by climate change to bio-physical and socio-economic systems can create a ‘before’ and ‘after’ divide in the history of a planet that has never been shared by so many humans. Whereas, according to accepted scientific knowledge, a wide range of impacts that are already

being felt will continue to aggravate in frequency and intensity¹, some projections identify ‘tipping points’ (Pearce 2007) that would lead to a fast acceleration in destruction of natural and human systems and result in a world that would be dramatically different from what we know.

A maximum rise of 2°C in global average temperature has been naturalized in many discourses as the key to avert danger but is contested by small-island states and other vulnerable groups that are already suffering strong impacts from a rise of about 1°C. Even to stay around the 2°C limit, it would be necessary to reduce global emissions of greenhouse gases between 50 and 85% of current levels by 2050 and they would need to continue decreasing rapidly after that. The changes needed in energy generation and energy uses, including transportation, industrial processes, heating and cooling of buildings, etc, are massive. Some have called for a ‘great turning’, a ‘great transition’ or a ‘great transformation’ (e.g. New Economics Foundation 2010). But it has been slow to come. Instead, many forces are invested in preventing any modification. Climate change is viewed as a threat to many economic and political interests in the richest countries, like the US, and to ‘development’ in others, including China (currently the world’s biggest emitter of greenhouse gases - GHG).

From the above, it starts to become clear that climate change constitutes a very rich terrain for discourse analysis. There is more however. Climate change has a set of characteristics, such as many ‘invisible causes’ (to our senses), various ‘distant impacts’, and ‘delayed or absent gratification for taking action’ (Moser 2010), that make it difficult to grasp or challenging to feel engaged with. Therefore discursive constructions are of vital importance to define and negotiate its meaning. Furthermore, climate change is a multi-faceted matter that can be looked at from a variety of angles. It is a scientific, political, social and economic issue. It is also a key ethical issue posing questions of equity and fairness between generations, regions of the world, peoples and social classes: the poor have the lowest contributions to the enhanced greenhouse effect but are amongst the most vulnerable victims of the impacts of a changed climate.

¹ For more information and publications of the Intergovernmental Panel on Climate Change go to www.ipcc.ch.

Multiple voices, arguments and claims compete for attention in various arenas. As one such spaces, which is constantly influxed by others, the media are decisive to the social amplification and legitimation of some views and the marginalization of others. Media(ted) discourses will therefore deserve a good degree of attention in this chapter. Climate change requires expert skills and knowledge to be understood: scientists were the ones who first brought it to light and will continue to play a key role. Science has important connections to policy and policy-making, and climate change has been subjected to variegated interpretations in the realm of politics, governmental and otherwise, partly via the media.

The chapter will start by presenting a short version of the science and politics of climate change and discuss how they unfolded in different arenas. Given the centrality of knowledge claims to the analysis of climate change, processes of social construction of scientific knowledge and the nexus with policy-making will be discussed. This will be followed by an examination of discourses that have dominated the politics of climate change and their socio-political implications. Finally, the chapter will point out some emerging and as yet under-researched issues.

Introducing climate change science and politics

As Bodansky (2001, p. 24) has noted, the ‘development of the climate change issue initially took place in the scientific arena as understanding of the greenhouse problem improved.’ In the late 1980s, it became a political issue and a matter of intergovernmental relevance that saw a process of scientific and political institutionalization. The Intergovernmental Panel on Climate Change (IPCC) was established in 1988, ‘in part as a means of reasserting governmental control over the climate change issue’ (Bodansky 2001, p. 28). Bringing together the world’s leading atmospheric scientists, by appointment of national governments, it aimed at producing a full assessment of scientific, technical and socio-economic information on climate change and formulating response strategies. Whereas the press in both the USA and the UK (as well as other countries) had only dedicated a few occasional pieces to this topic, from 1988 coverage intensified significantly (Carvalho 2005, Mazur 1998) constituting climate change into a topic for public attention.

The IPCC's First Assessment Report was published in 1990 and the following key moment in the development of the international regime on climate change was the signature of the United Nations Framework Convention on Climate Change (UNFCCC) at Rio's Earth Summit in 1992. The Convention embodies a broad commitment to the reduction of GHG emissions by developed countries. The principle of 'common but differentiated responsibilities' (UNFCCC) was translated in the creation of two groups of countries: 'Annex 1 countries', the 'developed' countries, which committed to stabilizing their GHG emissions, and 'Non-annex 1', the 'developing' countries, which were not given specific responsibilities. A Protocol to the UNFCCC was formally accepted at the third Conference of the Parties (COP-3), which took place in Kyoto in 1997. The Kyoto Protocol mandated an average cut of 5.2% in GHG emissions to be attained in the following 15 years. In the scientific front, the IPCC had issued its Second Assessment Report in 1995, which spoke of a 'discernible human influence' on climate. The Third Assessment Report, published in 2001, revised forecasts of global warming upwards. For the 21st century, the IPCC estimated the temperature rise to be between 1.4 and 5.8° C.

Further to a post-Kyoto drop, levels of media coverage of climate change started rising again after the year 2000, pushed by a rather tense COP-6 in The Hague (2000); George W. Bush's withdrawal from the Kyoto Protocol (2001); and the release of the Third Assessment Report of the IPCC (2001). In 2006 and 2007 three factors led to a peak in media attention: the publication of a report in the UK by Lord Stern on the economics of climate change; the release of Al Gore's book and documentary *An Inconvenient Truth*; and the publication of the Fourth Assessment Report (FAR) of the IPCC, which heightened again the level of risk: the top range of projected warming under one scenario was set at 6.4° C. Grundmann and Krishnamurthy (2010) examined media coverage of climate change in France, Germany, the UK and the USA and identified a 138% rise in the number of news pieces in 2007 compared to the previous year.

Levels of media interest in 2007 would only be superseded, in some regions, in 2009 with the so-called Climategate, the illegal hacking and release of email correspondence falsely proclaimed as proof of scientific manipulation of climate data, and the COP-15 in Copenhagen. COP-15 generated an enormous momentum as it was

expected to produce an agreement to replace the Kyoto Protocol, which was to expire in 2012. Unprecedented levels of civic mobilization led to large-scale demonstrations in several parts of the world and to a significant participation in Klimaforum09, a civil society climate conference on the side of the COP. However, political negotiations failed to lead to agreement and only a non-binding 'Accord' was produced by the US, China, India, Brazil and South Africa which was critically received by many governments, NGOs and other social actors. The Copenhagen summit generated a widespread sense of disappointment and was followed by a sharp drop in the volume of media coverage. At the time of writing, there was hope that COP-21, to happen in Paris at the end of 2015, would lead to a new global agreement and levels of media and public interest were up again.

The three parts of the latest IPCC Assessment Report (AR5) were launched in 2013 and 2014. AR5 maintained that it is 'extremely likely' that human influence has been the dominant cause of observed warming since 1950. Climate impacts are said to be already occurring in all continents and across the oceans. The level of risk is projected to increase significantly over the coming dates regarding death, ill-health, food and water insecurity, loss of ecosystems, extinctions, etc.

The social construction of scientific knowledge and the science-policy nexus

When compared to other science domains, research and knowledge on climate change has several distinctive characteristics: it draws on a wide variety of disciplines and areas of expertise, from biology to climatology; it involves a variety of spatial and time-scales; the most valuable contribution it can offer to policy-making are estimates of future changes, not descriptions of an existing reality; and it involves a large degree of not only uncertainty but also, inevitably, of indeterminacy. These traits render climate change into a particularly non-self-evident and non-stable matter where constructions of knowledge claims are especially sensitive, politically and socially.

Given its diffuse and highly complex nature, scientific tools, methods and models have been crucial to bring climate change out into symbolic existence. The procedures and the 'machinery' of collection and interpretation of climate-related data have themselves been the subject of some critical work with commonalities with discourse analysis.

Demeritt (2001), for example, has exposed the assumptions involved in some of the early Global Circulation Models and showed that they appraised the value of human lives very differently in different parts of the world. Attention to ‘mediations’ in scientific knowledge, i.e. the conceptual and technical devices that are both products and producers of knowledge, is therefore called for and this kind of ‘constructivist critique’ (Demeritt 2006) ought to remain as a continuing part of the research agenda of social studies of science and technology. Discourse analysts could certainly infuse it with valuable tools.

Climate change is also a prime example of what has been termed ‘post-normal science’ (Funtowicz & Ravetz 1993) where facts are uncertain, values are disputed, stakes are high and decisions are urgent. Those traits and other contextual factors may be part of the explanation of why climate change has been prone to intense contestation and to ‘diversionary reframing’ (Freudenburg & Gramling 1994). A number of social actors have offered different definitions of the issue, associated to different values and priorities (some would say ‘interests’), in some cases attempting to make the debate appear to be about something else. Those definitions have received a disproportionate amount of space and attention in media and other public arenas, as exemplified below.

One of the most prominent topics of research on climate change communication has been the media ‘translation’ of uncertainty. Studies on media reconstructions of scientific knowledge have shown a very different picture across the world with regards to the presence of climate change scepticism – or, as arguably preferable, denialism – in the media. In the USA, Boykoff and Boykoff (2004) examined news reports’ depictions of anthropogenic climate change and concluded that most offered a ‘balanced’ image with mentions to both the anthropogenic nature of climate change and its denial. The journalistic norm of balance, closely tied to ‘objectivity’, when applied to actors and claims that are very distinct in their professional authority and credibility, leads to (and is used to legitimate) bias in media discourse.

Scholars McCright and Dunlap (e.g. 2000) and Oreskes and Conway (2010) have shown that there has been an intense activity by the fossil fuel industry, pro-market think-tanks, political conservatives and others in the generation of doubts regarding the occurrence of climate change, its anthropogenic nature and/or the significance of its

impacts, in other words, in the construction of what Freudenburg (2000) has termed the ‘non-problematicity’ of climate change. In a study of numerous USA’s newspapers Antilla (2005, p. 350) concluded that ‘some of the news outlets repeatedly used climate sceptics—with known fossil fuel industry ties—as primary definers’. Research on Australian media has revealed a similar situation. In the case of news outlets like *The Australian* extreme levels of distortion of scientific knowledge have been found, with a frequent alignment with the positions of neoliberal think tanks and other sceptical sources (McKewon 2012).

These findings raise questions at the level of what Fairclough (1995) calls ‘sociocultural practice’, encompassing the ‘situational context’, ‘institutional context’, and ‘socio-cultural context’, as well as at the level of ‘discourse practice’, i.e., the conditions of production of texts by journalists, editors and other media professionals (including news values and norms in operation, forms of pressure, and relation to audiences). Both dimensions are worth continuous consideration and work by discourse-minded researchers and can certainly offer crucial leads to understanding the cultural politics of climate change.

In a critical discourse analysis of the British press, Carvalho (2007) showed that media discourses on scientific knowledge related to climate change are connected to the ‘ideological cultures’ of news institutions. The selection of research to be reported in news texts, the ‘authorized agents of definition’ and the interpretations of the meaning of scientific claims for politics and society were all derived from and sustained the dominant ideology in each of the newspapers, which involved particular prescriptions for (in)action on climate change.

Instances of climate scepticism/denialism found in the UK press were not as prevalent as in the US or Australia (cf. Painter 2011). Nevertheless, in an analysis of assertions, presuppositions, and factives, amongst other discursive features of US news, Kuha (2010) pointed out that the degree of certainty in US reports on climate change increased after 2007. More recently, though, Bailey, Giangola and Boykoff (2014) compared the language of US and Spanish newspaper reports on climate change and concluded that the former still had a ‘higher density of epistemic markers’, including references to ‘activities that produce inherently uncertain products, such as *predicting*,

estimating, and *projecting*; quantitative descriptors of uncertainty, such as *probabilities* and *likelihoods*; common hedging verbs, such as *believe*, *consider* and *appear*' (p. 202), and 'more ambiguous grammatical constructs of uncertainty' (p. 197). This type of linguistic analyses of texts on climate change has been sparse and could contribute to a better understanding of the implications of word and grammar choices for the construction of the meaning of the issue.

Much research is also needed beyond the press. Focusing on sceptic bloggers, Nerlich (2010) offered one of the first and few discursive studies on new media. She showed how a 'paradoxical mixture of religious metaphors and demands for 'better science'' allowed 'sceptics' to 'undermine the authority of science and call for political inaction' (p. 429). Examples of metaphorical expressions suggesting that 'science is religion' included: 'dogma' about scientific theories, 'zealots' about scientists, and 'doomsday prophecies' about scientific predictions (ibid.). Forchtner and Kølvråa (2015) examined discourses of the British National Party and the Danish People's Party and found that in contrast with a position in favour of conservation of 'nature as national countryside and landscape', they deny or cast doubt on climate change. As the 'transnational undermines the nationalist ideal of sovereignty' (p. 199), populist radical right parties attempt to refute the threat of climate change and re-focus the debate on energy self-sufficiency. A critical discourse analysis of books, online discussions and other sources in China pointed to a conspiratorial reading of climate change as part of a Western plot to impede Chinese development that is strongly grounded in national identity politics (Liu 2015). Although not officially supported, this particular breed of climate scepticism is an important undercurrent to public debate (ibid.).

Whereas climate scepticism is present in many spaces, it is not universal. For instance, in Germany (Peters & Heinrichs 2008); Portugal (Carvalho 2011); Sweden (Olausson 2009); France, India, China and Brazil (Painter 2011) skeptical views are given little room in the media. A combination of socio-cultural, political and media-related factors (Painter 2011) is likely to contribute to these inter-country differences.

As we have seen, uncertainty in scientific knowledge has been discursively appropriated and used to refute political, social and economic changes. However, it should not be inferred from this that uncertainty in climate-related knowledge should

be hidden or overlooked in climate change communication. Doing so would likely do a bad service to public trust in science. As can be inferred from the following paragraph, while scientific consensus on fundamental aspects of anthropogenic climate change should be made clear there should also be acknowledgement of aspects of uncertainty and indeterminacy.

Unfounded certainty in media discourses, for instance regarding the future occurrence of given weather events, or the representation of impacts projected by some emissions scenarios as inevitable has been identified in multiple countries, often combined with some form of sensationalism, such as the use of fatalistic vocabulary or imagery. In Germany, Weingart, Engels and Pansegrau (2000) noted a tendency to report climate change in catastrophist terms since the mid-1980s, which they attributed to the media's preference for 'sensationalism, negativity and unequivocal clearness' (p. 275) as well as to scientific and political discourses in the country. Peters and Heinrichs (2008, p. 34) have shown that in more recent times the German media reconstruction of climate change has closely followed the IPCC reports and has therefore toned down certainty. According to Ereaut and Segnit (2006), 'alarmism' was one of the dominant 'linguistic repertoires' in the British press (the other one being an optimistic one). They view 'linguistic repertoires' as 'systems of language that are routinely used for describing and evaluating actions, events and people', offering structured ways of thinking and talking, and functioning as 'resources that people can draw on' to make sense of an issue (p. 7). In their media analysis, they argue that:

'The alarmist repertoire is typified by an inflated or extreme lexicon. It incorporates an urgent tone ('We have to act. Now. Today!') and cinematic codes, with images and ways of speaking that are familiar from horror and disaster films (...) It employs a quasi-religious register of doom, death, judgement, heaven and hell, using words such as 'catastrophe', 'chaos' and 'havoc'. (p. 13)

Some have spoken of an 'apocalyptic genre' (Smith 2012) or labelled this kind of media representation as 'climate porn' (Lowe 2006). Its appeal to fear has been criticized. More specifically, it has been considered ineffective in mobilizing people as it can generate disbelief or apathy ('if the world is doomed there is nothing that can be done about it'). For example, in a study with visual representations of climate change, O'Neill and Nicholson-Cole (2009) concluded that the most dramatic ones made people feel the least empowered to act (whereas images of a low energy light bulb, a cyclist

and a thermostat were the ones that made them feel most able to act). Perceived agency is key to engagement with climate change. However, there is some evidence suggesting that a negative imaginary is widespread and that response possibilities are not prominent in people's mental representations (Lorenzoni et al. 2006).

Further exploring connections between discursive structures and understandings of climate change, and identifying alternative definitions of the issue itself and, crucially, of citizens' roles is an important task. The functions of rhetorical devices, such as metaphors (cf. Asplund, Hjerpe & Wibeck 2013, on 'greenhouse', 'war' and 'game' metaphors and Nerlich & Koteyko 2009, on 'carbon compounds', such as 'carbon footprint' or 'carbon ration'), in the development of frameworks for communicating and acting 'materially' upon the world will continue to deserve analysts' attention. Maintaining a sense of urgency and gravity and, simultaneously, pointing to possible responses that may engage a variety of social actors is a tricky but crucial challenge in climate change communication.

Although this section has focused mostly on scientific aspects, science, society and politics are never separate. 'Processes of knowledge-making', says Hulme (2010, p. 563), 'are intimately bound up with the assumptions about political and social ordering which lie implicit in the institutions which enable and endorse this knowledge.' Indeed, as the sociology of scientific knowledge has taught us, social contexts and values weigh heavily on the production and the uses of knowledge. Likewise, news texts about science both reproduce and challenge worldviews, thereby serving important social and political functions, such as legitimating certain political plans for action or inaction.

In the end, climate change science is unlikely to 'save the world'. The kind of science-based consensus that much literature (mostly north American) appears to aspire to is, in all probability, not going to happen and it would not be automatically translated into concerted action either. As Hulme (2009) notes in *Why we Disagree about Climate Change*, it is much more about values, culture and politics than it is about science.

Techno-managerialism and alternative discourses

In the last few decades, several developments in policy-making processes and the

widespread neoliberal move have played a part in erasing the space for public debate and citizen involvement. Those trends constitute the backdrop for examining the options available to address climate change and for imagining new ones. Dominant discourses have thus constructed climate change in ways that have tended to depoliticize it. While climate change raises fundamental social, ethical and value-related matters, the techno-managerial discourses (and material practices) that have come to be hegemonic have transformed it into a narrow and exclusionary language of numbers, models and legal jargon. Responses to climate change have been largely privatized through carbon markets, energy investment decisions, price speculation, etc., which displace non-expert voices. In Rothe's words (2011, p. 341), there has been a progression towards a 'post-political condition in climate politics where policies are chosen by economic and scientific technocrats rather than by a democratic decision-making process.'

Multiple discursive practices have contributed to the reduction of public debate on climate change. Given their privileged power position, the ways in which formal political bodies frame the issue are key to its wider circulation. Analyzing discourses of the WTO, IMF, World Bank and OECD, Methmann (2010) has noted that those international organizations have claimed to embark on climate protection while remaining silent about their role in causing the problem. By discursively appropriating climate change in ways that serve the agenda of continuous economic growth, they leave out any debate on the economic and political structures that are at the basis of the current environmental crisis. For instance, the WTO has argued that the 'increase in income that trade brings about can lead society to demand better environmental quality' and the World Bank has put the emphasis on 'low carbon growth strategies' (ibid.). Politics is increasingly missing from discussions about sustainability that involve institutions, markets and technology, and the power relations that shape possible responses to climate change are absent from most debates.

Several studies have shown that governments and intergovernmental organizations have strongly shaped media agendas and discourses. In fact, fluctuations in the volume of media coverage of the last two decades in various countries have revealed an important impact of political initiatives with most peaks in media attention in, for instance, the UK, Sweden and Japan, coinciding with intergovernmental summits

(Carvalho 2005; Olausson 2009; Sampei & Aoyagi-Usui 2009). Analysis of references to different social actors in newspaper articles also suggests a clear predominance of governmental sources in several countries (e.g. Yun et al. 2012), at the cost of alternative ones, most strikingly from civil society. Ironically, a lot of media space is awarded to political actors (but typically only those in power positions) and to policy issues (measures and proposals put forth by governments) but not in ways that contribute to *the political*, in Mouffe's terms (2005). Discourse analysis of media coverage has pointed to a frequent reproduction and legitimation of governmental discourses promoting techno-managerial approaches and to the marginalization of more transformative discourses (Carvalho 2005; Carvalho 2011). While we should be weary of homogenizing analyses of media discourses and should acknowledge the existence of alternative (re)constructions of climate change, it is fair to say that most of the mainstream media have helped produce consent towards neoliberalism and free-market capitalism (e.g. Edwards & Cromwell 2006).

Aitken (2012, p. 226) has maintained that '[t]he dominance of narrow, modernist framings of climate change serves to shut down debate and alternative framings are largely excluded from public and policy discourse'. Echoing Blüdhorn's arguments about 'post-ecologism', Aitken (ibid.) claimed that 'despite vocal commitments to addressing climate change, society is largely unwilling to make significant sacrifices and lifestyle changes in order to meet this goal (...). Therefore, more radical framings are not advanced since they are perceived to be adverse to individuals' and society's interests.' These assumptions about 'society' are of course unduly uniform but there is indication that they are quite influential over decisions of policy-making bodies and others contributing to a perpetuation of existing models.

The production of (seemingly) consensual views on how to address climate change has also been helped by the discourse of 'sustainable development' and its derivatives, such as ecological modernization and its present epitome of the 'green economy' (Kenis & Lievens 2014; UNEP 2011). As a promise of conciliation of economic, social and environmental needs and wishes, 'sustainable development' has been as attractive as it is prone to ambiguous uses. However, that very ambiguity and open-endedness has contributed to dissolve conflict, bringing all sorts of social actors on board (Krieg-Planque 2010). More radical forms of environmental discourse and mobilization,

including appeals for transformation of social, economic and political structures, have been pushed aside. As Swyngedouw (2010, p. 228) has noted:

‘the sustainability argument has evacuated the politics of the possible, the radical contestation of alternative future socio-environmental possibilities and socio-natural arrangements, and has silenced the antagonisms and conflicts that are constitutive of our socio-natural orders by externalizing conflict.’

Research suggests that mainstream media have often naturalized and neutralized such ‘sustainable development’ discourses. For instance, Saunders, Grasso and Price (2012) state that analysis of ‘four British newspapers reveals consensus around a light-touch approach to sustainable development. Despite increased frequency of reporting (...) over time, very few articles challenge the status quo or corporate affairs.’

Many of the discourses on climate change that are found in the media have become increasingly technical in the last few years, thereby limiting citizen comprehension, let alone engagement. Koteyko (2012) has referred to a ‘market-driven sustainability’ regarding British media discourses on carbon emissions. She found that the media have often set up...

‘... equivalences between the application of the marketplace instruments of carbon trading and investment and sustainability practices. Such reporting promotes recontextualisation (...) of sustainability within the confines of corporate discourse through the use of carbon compounds and accompanying finance terms.’ (p. 33)

Trough the analysis of ‘framing devices’, metaphors and lexical co-occurrences, Koteyko’s analysis suggests that the media have aided the appropriation of the discourse of ‘sustainable development’ by business.

Framing the future in ‘sustainable development’ terms often seems to be inescapable in democratic societies as most other discourses have been marginalized to a point where it would be hard to win a significant support basis. Still, there are ample variations in understandings of sustainable development and it is crucial that those differences are spelled out and the implications of each option debated (see Hopwood, Mellor & O’Brien 2005). Hardly any discourses on climate change have contemplated this. Discourses that refer to fundamental transformations in current political-economic

systems, such as the discourse on degrowth, are systematically excluded from mainstream media (with the occasional exception of an opinion piece).

Outstanding issues open to research

Climate change is an ever-evolving domain and that is not just true at the atmospheric and bio-physical levels. Understandings of the problem and of the challenges it involves may not progress as fast as necessary but they undergo transformations. For instance, the 2015 encyclical published by Pope Francis on climate change brought a new voice to the debate and stirred it towards questions that are often ignored in many sectors of society creating new opportunities for discourse-related research. Also, as societies develop responses to climate change, important new issues arise. For example, there is significant interest in the development of large-scale technological ‘fixes’, such as the reduction of solar radiation on the planet via aerosols or the increase of carbon sinking via iron fertilization of the seas. These and other geo-engineering projects involve major new risks and unknowns that have been mostly kept away from public scrutiny. On a more encouraging note, the movement in favour of disinvestment on fossil fuels that has grown in the last few years, and the specific campaign led by the *Guardian* in 2015, amounts to a new and potentially significant form of climate activism. Examining discourses (and silences) on such pathways to our collective future is of vital importance.

As apparent in the previous section, the politics and the ‘non-politics’ of climate change ought to continue to be subjected to (critical) discourse analysis. Researchers should single out and investigate ongoing struggles over climate justice and political power, but also over nature, lifestyles and money, amongst other matters which climate change is connected to. A discourse-political analysis will be concerned with the choices and non-choices, as well as the rights and duties, of countries, corporations, social classes and individuals. This should include both powerful actors, such as the European Union (Krzyzanowski 2013) or large fossil fuel companies (Ihlen 2009), and under-studied (from a discourse-analytical perspective, at least) groups and social movements, such as the Climate Justice Movement, Climate Action Camps and Transition. The creation of consensus on depoliticising policies, such as emissions trading (Felli 2015), and

the imagined alternative possibilities advanced by those social movements involve discursive processes of key interest.

Attention to the meanings of climate change in public spheres will continue to be warranted. More research is needed on television, the medium that is (still) the chief source of information (and arguments, and values, and opinions...) for many people around the world. The extraordinary development of digital communication calls for more and better studies. Twitter exchanges on climate change have recently been a focal point of several new publications (e.g. Kirilenko & Stepchenkova 2014) but none are discourse-analytical. Doing that kind of work on social media would be an important contribution to knowledge.

Research should also diversify in geographical terms. There are wide differences in what we know about media (and other) discourses in the so-called Western world and developing countries (Schäfer & Schlichting 2014). Academics should develop a greater sensitivity to the specificities of different countries in the (global) politics of climate change and ask questions accordingly (Olausson & Berglez 2014).

Both questions and tools shape research findings. Given the large amounts of text on climate change currently available, researchers need to make choices and compromises. Some have explored various questions via computational linguistics (e.g. Grundmann & Krishnamurthy 2010) and others have combined it with Critical Discourse Analysis (Bevitori 2010) for deeper understanding. Some approaches and methods are scarce in climate change research: such is the case of multimodal discourse analysis, which would be highly relevant for the analysis of television and new media, for instance. Reisigl and Wodak (2015) have recently contributed to filling this gap by applying the multi-theory and multi-method Discourse-Historical Approach (DHA) to online news texts on climate change. More generally, DHA has a strong potential for productive analysis of any climate-related discourses and their contexts.

Finally, discourse analysts should continue to critically examine relations between texts on climate change (science reports, political speech, materials from corporations, media reports, etc); their producers (multiple social actors, journalists, public relations professionals – see Anderson 2009); and consumers (who are increasingly ‘prosumers’),

as highlighted by others (Olausson & Berglez 2014). A range of questions may be raised about that circuit involving, amongst others, textual representations, behaviours, social conditions, cultures and subjectivities. To the extent that discourse does not just have a function of representing the world but also of constructing social relations and identities, examining subject positions on climate change as ‘places of enunciation’ (Rothe 2011, p. 334) that are ‘contingent and continually negotiated’ may contribute to understanding social and political (dis)engagement, a key issue if we are to succeed in constructing a sustainable future in a democratic manner.

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