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Taming the Climate? Corpus analysis of politicians' speech on climate change

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ABSTRACT

The politics of climate change is much discussed, but there has been little investigation into how politicians themselves understand or articulate the issue. Corpus analysis, a method developed within linguistics, is used to investigate how UK politicians talk about climate change, using the example of the 2008 Climate Change Bill. Corpus techniques, including keyword analysis, collocation and semantic tagging, are used, alongside critical reading of the text. The analysis shows that politicians frame climate change as an economic and technical issue, and neglect discussion of the human and social dimensions. They are selective in their use of scientific evidence, with little mention of abrupt or irreversible change. In doing so, they attempt to 'tame' climate change, rather than confronting difficult realities. While this strategy has the benefit of political acceptability, it does not allow for discussion of the full political and social implications of climate change, and precludes more radical responses.

KEYWORDS climate change; politicians; speech; discourse; Hansard; corpus analysis; the UK

Introduction

It is difficult to overstate the challenge that climate change poses for politics. As evidenced by the Intergovernmental Panel on Climate Change (IPCC), climate change is likely to cause instability and uncertainty in both natural and human systems (IPCC 2014). This instability, together with the challenge of achieving significant emissions reductions, has far-reaching implications for the way in which politics is done. The politics and governance of climate change have been much discussed (e.g. Giddens 2009, Swyngedouw 2010, Steffen *et al.* 2011, Urry 2011, Biermann *et al.* 2012, Dalby 2013, Dryzek 2014, Johnson *et al.* 2014, Latour 2014). Yet, there has been very little attention paid to a crucial group of individuals at the centre of this challenge: the politicians themselves, who, working through

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institutions at the global, national and local levels, have the task of mediating responses to complex climate-related problems.

How do politicians understand and articulate an issue as complex as climate change? A recent comprehensive literature review found very little research into this issue (Rickards *et al.* 2014), a useful exception is Fielding's *et al.* (2012) survey of Australian politicians). In the research presented here I begin to address this gap, using corpus analysis of speech by Members of Parliament (MPs) in the UK to analyse how politicians conceptualise and present climate change as a political issue in their discussion of the 2008 Climate Change Bill. The research is part of a collaborative project between Lancaster University and the think tank Green Alliance, who since 2009 have run the Climate Leadership Programme, which introduces MPs in the UK to the science, policy and politics of climate change.

I begin with a discussion of the way in which politicians, rather than responding in a straightforward or linear way to climate science, actively craft and shape the issue to fit with their outlook, and those of their supporters and other actors. I draw on the literature on 'framing' in politics (Downs 1972, Hajer and Forester 1993, Kingdon 1995, Cobb and Coughlin 1998, Benford and Snow 2000) to discuss how issues come to be seen and described in particular ways; and examines the central role of language in defining political positions and issues (Fairclough 2000). Two aspects of 'framing' are considered: first, how climate change is discussed – what type of language is used; and second, what aspects of climate change are excluded from debate.

I then introduce corpus analysis, a method developed within linguistics, to discuss how the technique can provide empirical evidence for such framing processes. The critical advantage of corpus analysis is the ability to handle large quantities of text, thereby spotting patterns and styles of speech that may not otherwise be evident. For this research, a corpus of 97,000 words was created from Hansard, the online record of parliamentary speech. The corpus was analysed using three techniques: keyword analysis, examining the frequency of significant words in comparison to other corpora; collocation analysis, investigating which words are used together and offering insights into the meanings given to key terms; and semantic tagging, which compares the relative frequency of use of groups of words which share similar meanings.

Corpus analysis demonstrates that MPs used a scientific and economic framing to discuss the Climate Change Bill. In doing so, they exclude discussion of the environment or non-human species. There is also very little discussion of people or social factors. Further, their use of science is selective, with risks of abrupt or irreversible climate change downplayed or ignored.

I conclude with a discussion of the reasons for, and implications of, such discourse. I suggest that politicians are attempting to 'tame' the climate by framing a difficult, complex issue in a less threatening way, and suggesting

technical and economic solutions, but this means that they do not discuss the far-reaching implications of climate change for political and social life. I suggest ways of bringing about a more comprehensive treatment of climate change in politics, and also offer reflections on the use of corpus analysis in the study of politics.

Understanding political speech on climate change

While politicians are not the only actors in climate politics, their role is crucial. Many, if not most, proposed responses to climate change require legislative action. This in turn requires politicians to advocate, act and monitor. Yet politicians' reasons for acting, or indeed not acting, on climate change are not well understood. Consumer behaviour is put under intense scrutiny (Jackson 2005) and the strategies of corporate leaders are analysed (Wright *et al.* 2012, Rickards *et al.* 2014), but much less has been said about political decision makers. Discussions of politics and governance tend not to examine the motivations or outlooks of the people who do the politics, but use the terms 'governance' and 'politics' in the abstract (see, e.g. Dalby 2013, Dryzek 2014; Lövbrand et al., 2009).

It is clear that politicians do not respond to scientific evidence on climate change in a simple or linear way, and neither should we expect them to. Indeed, the way in which all people understand and interact with scientific evidence is complex (Wynne 1996, Demeritt 2001, Hulme 2009, McNeil 2013). Yet an assumption persists, particularly among the scientific and policymaking communities, that scientific evidence will translate straightforwardly into political action (Hajer *et al.* 2015). Hajer et al. coin the phrase 'cockpitism' to describe the illusion of a simple and smooth progression from scientifically defined issue, to international agreement, implemented by national governments acting in the best interests of the planet as a whole.

In reality, it has long been understood that politicians do not passively translate evidence into appropriate action, but instead, whether consciously or not, shape an issue to fit with their ideology, the views and opinions of voters and other actors, a sense of what is achievable, prevailing norms and assumptions and so on (Downs 1972, Hajer and Forester 1993, Kingdon 1995, Cobb and Coughlin 1998, Benford and Snow 2000). This 'framing' process influences both *how* issues are discussed, including what type of language is used; and *whether* certain aspects of the issue are discussed at all, or if they are instead ignored. These are discussed in turn below.

Framing: how issues are discussed

As noted above, the way in which climate change is discussed in Parliament and elsewhere is framed by politicians and other actors. Framing can be

understood as 'signifying work or meaning construction … an active, processual phenomenon' (Benford and Snow 2000, p. 614), an ongoing process of describing and defining an issue to fit with the aims of a particular group or movement. Such framing happens with all issues, but is particularly apparent with complex risk issues like climate, which are both caused by, and understood through, the interplay of technology and society. As Ulrich Beck argues, such risks are mediated: 'Without techniques of visualisation, without symbolic forms, without mass media, etc., risks are nothing at all' (Beck 2006, p. 332). So the question of who visualises or gives form to risk is all important.

One of the most crucial ways in which such framing takes place is through language. Norman Fairclough writes that 'political differences have always been constituted as differences in language, political struggles have always been partly struggles over the dominant language' (2000, p. 3). This is not to say that political struggles can be reduced to linguistic struggles; rather that language is a crucial way in which different political groupings assert their positions and generate alliances. In Hajer's conception of 'discourse coalitions', argumentation is 'the medium through which actors try to impose their view of reality on others, suggest certain social positions and practices, and criticise alternative social arrangements' (Hajer and Forester 1993, p. 47). Thus discourse helps to frame and direct political outcomes. It is 'socially *constitutive* as well as socially shaped' (Wodak and Fairclough 1997, p. 258).

In the late 2000s, the UK Labour Government made a conscious choice to frame climate change as a discussion about economics, with the publication of the government-commissioned Stern Report in 2007. Stern, an academic economist and government adviser, presented climate change as a 'market failure', and estimated the monetary costs and benefits of climate action (Stern 2007). Though controversial, this approach won the support of business groupings and helped to build the cross-party support which contributed to the successful passage of the Climate Change Act (Carter and Jacobs 2014). The Labour administration's strategy can be seen as part of a wider trend towards using economic language and policy instruments to achieve environmental goals, termed 'ecological modernisation' (Hajer 2000).

Framing: whether an issue is discussed at all

It is also important to consider which issues, or aspects of an issue, are not discussed at all. As noted above, strong scientific evidence does not automatically lead to a response commensurate with the problem. The complex way in which an issue finds a place on the formal political agenda has been discussed at length in the political science literature (Bachrach and Baratz

1962, Kingdon 1995, Solecki and Shelley 1996, Cobb and Coughlin 1998). Kingdon's (1995) conception of 'policy windows', for example, maintains that an issue reaches the political agenda when three 'streams' converge: a well-defined problem; proposed solutions such as policy mechanisms; and political support for the issue. Carter and Jacobs (2014) use this model to explain the cross-party support for climate change in the UK Parliament in the late 2000s.

Some issues, however, are not taken up by the formal political process. Bachrach and Baratz (1962) noted the need to study 'non-decision-making', or the ways in which dominant influences and assumptions prevent discussion of some issues. Similarly Crenson (1971), in his empirical study of the politics of air pollution, showed that where particular interests dominate (in this case a steel company) politicians are inhibited, and do not speak out. What follows is not argument, but silence; hence the title of Crenson's book, *The Un-politics of Air Pollution*.

An example of the 'un-politics' of climate change is the lack of discussion, within the formal political sphere, of society's dependence on fossil fuels. Phelan et al., writing from a neo-Gramscian perspective, describe the hegemony of the 'fossil fuel historical bloc' Phelan *et al.* 2012. Mitchell (2011), goes a step further in claiming that modern democratic systems themselves are a product of fossil-fuel exploitation. Radical ecologist William Ophuls (1992) argues that modern societies and political systems are made possible by abundant natural resources and a stable environment, and that scarcity and environmental instability would threaten the viability of liberal democracy. If climate change alters the operating conditions for politics, that undoubtedly makes it a difficult issue to address within a formal parliamentary setting.

Using corpus analysis to understand political treatment of climate change

Here, I use corpus analysis to evidence UK politicians' approach to climate change, with reference to these two aspects of framing: first, how the issue is discussed; and second, whether certain aspects are discussed at all: what gets left out? As I set out below, corpus analysis provides strong evidence that MPs talk about climate change using an economic and technical discourse. There are significant gaps in the discourse too, particularly an absence of discussion of people, the environment or other species; the social impacts of climate change and policies to address it; and a reluctance to discuss the possibility of abrupt or irreversible climate change.

Why corpus analysis?

Corpus analysis is an approach developed within linguistics, analysing large volumes of text, known as corpora, composed of speech or written language

(Sinclair 2005, Wynne 2005). Software packages are used to identify patterns in language use, including the relative frequency of different words, and collocation, words which frequently occur together. Specific corpora can be compared with a 'reference corpus', a representative sample of language, such as the British National Corpus (BNC).

Such analyses originally informed the study of language, and linguists noted a crucial advantage of corpus methods: they uncover patterns or styles of speech that may not otherwise be seen by researchers. As John Sinclair, one of the founders of corpus linguistics, wryly observed, 'Language users cannot accurately report language usage, even their own' (Sinclair 1994, p. 7). Thus the statistical techniques of corpus analysis allow researchers to uncover patterns and traits of language use which are not immediately apparent to the users, teachers or analysts of that language.

This characteristic of corpus analysis – the ability to 'start with the text', using statistical techniques to uncover patterns in language that might not be apparent to a reader – makes it a useful technique for social science research too. As Partington (2012, p. 12) writes,

> At the simplest level, corpus technology helps find other examples of a phenomenon one has already noted. At the other extreme, it reveals patterns of use previously unthought of. In between, it can reinforce, refute or revise a researcher's intuition and show them why and how much their suspicions were grounded.

The potential of corpus analysis for social sciences has been recognised in recent years, with use of the method increasing (e.g. Baker *et al.* 2008, Caldas-Coulthard and Moon 2010) and some work looking specifically at language and climate change (Fløttum *et al.* 2014, Dayrell and Urry 2015).

Although corpus analysis uses statistical techniques, as with all such techniques its findings are not generated automatically but rely on the judgement of the researcher, who decides which texts to input, what analysis to undertake, what cut-off points to apply and so on (Baker *et al.* 2008). As such, it is an addition to, rather than a replacement for, a more qualitative discourse analysis, through detailed reading with consideration of the social, cultural and political context (Weiss and Wodak 2002). Combining corpus analysis and discourse analysis in an iterative process ensures that the right texts are used, and that insights gleaned from statistical analysis can be contextualised and explained (Baker *et al.* 2008, Wild *et al.* 2013, Baker and Levon 2015). This is the approach I take here.

Previous corpus analyses of Hansard offer useful insights into politicians' motivations and strategy (Baker 2004, Perren and Dannreuther 2013). For example, Baker's (2004) study of discourses of homosexuality within the House of Lords reveals a significant difference between the discourse used by those for and against reform of the age of consent for gay men. The

methodological norm, however, is for corpus linguists to extend their analysis into social science, rather than social scientists using tools of corpus analysis (Partington 2012), which makes the study described here atypical.

Method

I use corpus methods and critical discourse analysis (CDA) to investigate a key moment in UK climate politics: the discussion of the Climate Change Bill, which became an Act of Parliament in 2008. This Act set a framework for action on climate change, including statutory targets for carbon reduction, and established the independent Committee on Climate Change to advise and monitor progress. The Act had strong cross-party support, with all major parties on side and only five MPs voting against. This represented a significant breakthrough in UK climate politics, with high levels of party political consensus, though these were somewhat undermined the following year by controversy surrounding leaked climate emails and the failed Copenhagen negotiations, as Carter (2014) documents.

Preparation of corpora

I prepared two new corpora for this research: the Climate Change Bill (CCB) Corpus, and the Budget Corpus. I also used an already existing reference corpus, the BNC Sampler Spoken.

The CCB Corpus consisted of MPs' speech from the two main opportunities to debate the Bill on the floor of the House, in June and October 2008. As described above, the debates took place at a time of relative consensus in climate politics, and before the full effects of the economic downturn had been felt (Carter 2014). In June, in the so-called 'Second Reading', traditionally the stage at which the purpose and content of a Bill is debated, there was a 6-hour discussion. In October, MPs returned to the Bill for a shorter discussion of draft amendments. Speech from these two debates was combined to create the CCB Corpus, consisting of all 97,000 words from the two debates, downloaded from Hansard online. Combining the two debates provided a comprehensive corpus of political speech on the Climate Change Bill.

As described above, corpus analysis relies on comparison of the corpus under consideration with reference corpora. It is through comparison with other texts that significant patterns emerge. For example, examining word frequency without a reference corpus tells you that words such as 'and', 'to' and 'the' are frequent, but this does not shed light on the particularities of the speech under consideration. Examining word frequency in comparison

with a reference corpus reveals the way in which the speech in question is distinctive or different (Wynne 2005).

For this research, I used two reference corpora. First, I used a standard reference corpus, the BNC Sampler Spoken, which is a representative sample of spoken English, comprising approximately one million words of spoken English derived from public and professional settings (British National Corpus 2008). Comparing the Climate Change Bill speech with this standard reference corpus shows the differences between standard speech and the debate in question, revealing significant patterns.

The research also aimed to examine how MPs' speech on climate change differs from other speech in Parliament. For this reason, a second reference corpus was used, derived from another parliamentary debate of the same year – the 2008 Budget Debate. Comparing a budget debate with a climate debate reveals the particularities of how MPs talk about climate change. This corpus consisted of the full 50,000 word debate on the March 2008 Budget, and was named the 'Budget Corpus'.

The CCB Corpus and the Budget Corpus were prepared through downloading the debates from the Hansard website. Hansard is not strictly verbatim, as speech is lightly edited, which can pose a problem for some corpus studies (Molin 2007); however, this did not matter in this research, which focuses on the context and style of speech, rather than linguistic detail.

Analysing the corpora

In analysing the corpora, I made use of three corpus analysis techniques: keyword analysis; collocation analysis and semantic tagging.

Keyword analysis: Keyword analysis reveals which words occur frequently in the text under study, compared to a reference corpus. I analysed the CCB corpus using the Wmatrix programme, which allows the corpus to be compared to other corpora (Rayson 2008). The CCB corpus was compared with both the BNC Sampler Spoken Reference Corpus and the Budget corpus. Tables of words that were comparatively over- and under-used were compiled, and patterns were identified, as described in the results section below.

Collocation: I analysed keywords further through looking at their collocates, or words which frequently occur together with the keyword. This was done with a different software package, AntConc. Collocation shows which words frequently occur within a set span of text either side (usually the five words before or after the keyword, or 'node') and allows analysis of the way that the keyword is used, thus providing the 'atmosphere' of a word (Baker *et al.*2008).

Semantic tagging: Wmatrix software enables the text to be tagged, with words grouped into categories of meaning, or semantic fields, to look at which semantic groupings are used more or less frequently in comparison to another corpus. This allows trends and patterns to be identified which may not be observable at the level of individual words. For example, the semantic category 'work and employment' contains words such as work(ing), staff, (un)employment, jobs and employees. These individual words may not register as keywords on their own, but together they could form a key semantic group (Rayson 2008). As with keyword analysis, I compared semantic groupings in the CCB corpus with the two reference corpora. Lists of under- and over-used semantic groupings were scrutinised.

Combining corpus analysis with critical discourse analysis

As described above, when used in social science research, corpus analysis is best combined with CDA. CDA can be seen not as a specific, prescribed method but as a broad theoretical orientation, which combines close reading of the text with consideration of the social, political and cultural context of the text (Weiss and Wodak 2002, Baker *et al.* 2008). In this research, CDA was used both to situate the corpora – for example, incorporating an understanding of the significance of the Climate Change Act in UK climate politics; and to explain findings from corpus analysis through qualitative interpretation of MPs' speech.

Findings from corpus analysis of the 2008 Climate Change Bill

The techniques described above reveal clear patterns of discourse in the discussion of the CCB, pointing to particular framings of climate change as an issue. Below, I discuss two aspects of this framing: first, the way in which climate change is discussed; and second, what is not discussed at all.

How is climate change discussed?

The language used by politicians to discuss the Climate Change Bill is strongly scientific and economic in nature. Turning first to scientific evidence, in the debate on the Climate Change Bill, the words *science, scientific* and *scientist(s)* occur very regularly (128 occurrences), as shown in Table 1. Many speakers open their statements with reference to the science. This is true for those who support the scientific consensus, as represented by the IPCC, as well as those who are sceptical, or questioning of the prevailing consensus.

Table 1. Typical use of words 'science', 'scientist(s)' and 'scientific' (CCB Corpus).

Typical use of words 'science', 'scientist(s)' and 'scientific' (CCB Corpus)		
implying scientific consensus (90 occurrences)		
within the overall 2 C increase limit, which	scientists	say should not be exceeded
if the worst-case scenarios of the	scientists	are realised we will be in deep trouble
that can support human life can work. The	scientific	consensus is that there tends to be
governments must follow the latest	science	that clearly shows the need for the UK to
important Bill because, as is clear from the	Science	and the IPCC, these matters are
implying lack of scientific consensus (38 occurrences)		
A bit like medicine in the 1850s. The	scientists	are scratching the surface of
The most recent survey of climate	scientists	indicates that 46% of them disagree
If it is not, there is a danger that it is not a	scientific	report, but more of a political one
down to the activities of man. There is no	scientific	consensus on this, and there have been
discussion in the debates as though all the	science	was settled, but my reading of it is that

Table 2. Typical use of words within semantic grouping 'cause and effect/connection'.

Typical use of words within semantic grouping 'cause and effect/connection'		
human activity is by far the principle	cause,	and that with global action to reduce
from consumer activity in this country, is	responsible	for about 15 per cent of global emissions
rainfall and increased flooding are a direct	result	of the climate change that we are already
rises in fuel and food prices are of course	related	The prospect of an economic downturn
scientific knowledge: economic and social	implications	will also need to be taken into account
carbon pollution completely overnight, the	effects	of existing levels of CO2 in the

However, in using this language, politicians are not merely reflecting the scientific consensus. They are using scientific language selectively, to build their case. This can be seen through analysis of semantic groupings. Table 2 shows that a very significant semantic grouping, compared to standard speech in the BNC Corpus, is 'cause and effect/connection', including words such as *produce/impact/responsible/cause/effect*, suggesting that speakers are trying to build a case for action on climate change.

These patterns of speech suggest that when politicians are talking about climate change, they have to work hard to justify climate action. Detailed reading of the text shows that speakers tend to open with a statement on the science, and an explanation of causes and effects, before proceeding to discuss solutions. Although, in the debate under analysis, climate sceptic views were a small minority, all speakers had to justify their positions through recourse to the science. Even those who strongly support action on climate change feel the need constantly to explain why, suggesting that they see the case for action as fragile. This is not helped by the complex and indirect impacts of climate change, which means that politicians not only have to state the science but they also have to explain the links and connections of both climate impacts and climate solutions. It is also striking that, while 'science' is quoted often, there is very little discussion of potential non-linear changes in the climate system, an issue to which I return below.

Second, corpus analysis provides strong evidence that the dominant framing used to discuss climate change is economic and technical. When compared with the BNC Spoken reference corpus, three main groups of words stood out as keywords, used significantly more frequently in the CCB Corpus. First, words directly related to the subject of the debate (*climate change, bill, target* …), which is not surprising. Second, words usually used in parliamentary debate (*member, gentleman, amendment* …), which again is to be expected. Third, economic or technical phrases, referring to climate impacts or mitigation measures: *economy, capture [relating to carbon capture], efficiency, low-carbon, reduction/reduce, trading, costs, CCS [carbon capture and storage], fuel, power stations, measures*. Looking in terms of semantic groupings, the groupings 'science and technology in general' and 'money: cost and price' are over-represented.

The dominance of economic and technical language is notable in comparison with other parliamentary speech, as is demonstrated by a comparison with the Budget Corpus. While parliamentary speech about the budget obviously contains a large number of economic words and phrases, so too does speech about the CCB. In particular, Table 3 shows that the words *costs* and *benefits* are actually used more than twice as often in the CCB Corpus than in the Budget Corpus, to describe the impacts of climate change or policies to mitigate climate change.

This evidence shows that politicians use scientific, economic and technical language in order to construct a credible case for action on climate change.

What is not discussed?

Politicians' tendency to use scientific and technical language to discuss climate change is further emphasised by an examination of what is left out. I show below that some significant categories of speech are underused in discussion of the CCB: environment and non-human species; and people and social groupings. There is also little discussion of potentially far-reaching or catastrophic climate events.

Table 3. Typical use of *costs* and *benefits* in CCB Corpus.

Typical use of *costs* and *benefits* in CCB Corpus		
early action considerably outweigh the	costs	and that if the investments are made
produce lower-bound estimates of the	costs	of carbon abatement in 2050
they say: Both short and long run	costs	could be unevenly distributed, with
what we propose to do, who will bear the	costs	and who will get the benefits
and to reap the potential economic	benefits	that are on offer
possible to calculate precisely the economic	benefits	or disbenefits of specific actions
the thing is that it puts the maximum	benefits	of the actions proposed in the Bill
couple of years, but then the technological	benefits	should kick in, albeit before the

Environment and non-human species: Politicians barely mention the environment, and rarely stress their commitment to environmental protection, in discussions on climate change. The words *environment* and *environmental*, although used more than in the BNC Spoken reference corpus, did not occur frequently, and when they did, their meaning was nuanced. *Environmental* is used only 53 times (compared with *economy*, used 97 times, or *trading*, used 72 times). But nearly half of these relate to the names of organisations, such as the Environmental Audit Committee, leaving only 29 true uses of the word. Of these, only 14 can be identified as seeing environmental protection as a necessary or desirable thing – examples are set out in Table 4.

There are a further five uses of the term *environmental* which carry a negative or uncertain connotation, such as: 'green taxes serve only to give the whole environmental agenda a bad name' (Hansard 9 June 2008 col 121) or 'must be supported by evidence of the environmental benefit' (Hansard 28 October 2008 col 815).

Neither is there much mention of non-human species. The semantic category 'living creatures: animals, birds, etc.' actually occurs less frequently in the CCB Corpus than in everyday speech (the BNC Spoken reference corpus).

People and social groupings: It is striking that politicians do not talk about people when discussing climate change. Ten out of the top 60 words that are underused in the CCB Corpus (i.e. used more often in standard spoken English than in the CCB Corpus) are words directly connected with people: *you; I; she; they; he; them; me; her; him; people*. When analysing semantic groupings rather than words, the same pattern emerges: significantly underused semantic groupings include 'pronouns' and 'kin'.

Parliamentary speech is, of course, different from standard informal speech, and this could account for the above findings. To investigate this, the CCB Corpus was compared with the Budget Corpus. A similar pattern emerged. Words that were significantly underused in the CCB Corpus compared to the Budget Corpus include: *families, child, children, pensioners, parents*. The semantic grouping 'kin' was used six times more frequently in the Budget speech. As shown in Table 5, 'kin' words in the Budget speech are used to talk about how the budget may affect different groupings, with a

Table 4. Typical use of 'environmental'.

Typical use of 'environmental' (14 occurrences)		
not address climate change: the massive	environmental	migration, the flooding in some areas
Darfur, reiterating the linkages between the	environmental	degradation caused by global warming
there tends to be a 30-year delay in the	environmental	impact of the damage that we do now
I accept that climate change is a serious	environmental	threat that requires action. We have to
budget is met, along with the 2050 target. In	environmental	terms, it does not matter where in the

particular focus on families. Speakers use 'kin' words to stress how they want to help people. However, in the CCB Corpus, usage is more abstract: the most common term is *household/s* rather than *family/ies* and the focus is on the household as a unit for policy, such as 'reducing emissions … at household level' (Hansard 28 October 2008 col 749).

Detailed reading of the text reveals that a notable exception to this is the rhetorical appeal to consider the future world which grandchildren will inhabit, as a way of talking about potential climate impacts: 'I am concerned about … my grandchildren and the world they live in' (Hansard 9 June 2008 col 105). While this is unequivocally a personal appeal, it still differs from the Budget speech, which is concerned with immediate impacts on people.

Economic and technical language also dominates the debate about responses to climate change. Significant collocates of the word *carbon* (words occurring together with the keyword *carbon*) include: *storage, capture, low, budget(s), credits, price, reduc(e)/ing/ion, economy*. If, as Baker *et al.* (2008) suggest, collocates provide the 'atmosphere' of the word, it is clear that carbon is discussed as a technical issue, not a social one. This reduces the range of potential responses under consideration, and leaves no room for discussion of the embedded, socially bound nature of climate change and the 'locked-in high carbon legacy' (Urry 2011, p. 65) of social practices.

In short, it appears from this analysis that politicians do not discuss the human element of the climate problem, or solution, perhaps feeling that a more emotional, people-based narrative would be discredited – despite the widespread tendency of politicians to appeal to personal narratives and 'human interest'.

Abrupt or irreversible impacts: Lastly, there is very little discussion about abrupt or irreversible impacts of climate change, sometimes called 'tipping

Table 5. Typical use of words within semantic grouping 'kin' in CCB Corpus and Budget Corpus.

Typical use of words within semantic grouping 'kin' in CCB Corpus and Budget Corpus		
CCB Corpus (28 occurrences in 97k words)		
incentive schemes, designed to encourage	households	to minimise and recycle their waste
impact of this Bill on the costs of ordinary	households	to play their part
the world that they live in, and about my	grandchildren	and the world they live in
billion would equal over 10,000 from every	family	in every constituency
balance of reducing emissions, not only at	household	level but between different sectors
Budget Corpus (85 occurrences in 50k words)		
economy now and help businesses and	families	I will postpone that increase
many lives. Central to that is helping more	parents	into work. We want to demonstrate
for first-time buyers and lower-income	families	and this will help more people
one such constituent is 106 and her	husband	died 40 years ago
about charging 30,000 per member of a	household	. I am pretty sure concerns

points' or 'threshold events'. Although the possibility of such impacts was discussed in the previous year's IPCC (2007) and the Stern Review listed 'abrupt and large-scale impacts' (Stern 2007, p. 66), these are barely mentioned by politicians.

In the Parliamentary debate, there are only three mentions of these words or phrases (*tipping point/threshold (event)/abrupt/irreversible*). In presenting the Bill, the Environment Minister Phil Woolas speaks of 'a real risk of reaching the point at which abrupt or irreversible climate change happens' (Hansard 9 June 2008 col 37). *Tipping point* is used twice, but one of these uses is sceptical that tipping points are likely, despite the scientific consensus to the contrary. The MP in question states that 'the only argument for acting radically now is if there is a tipping point – a point of no return. None of the scientists whom I have read predicts that' (Hansard 9 June 2008 col 105). The word *threshold* is not used at all in this context.

Conclusion: taming the climate?

Corpus analysis of politicians' discussion of the 2008 Climate Change Act reveals a clear tendency on the part of politicians to 'tame' climate change, presenting it as a technical issue, amenable to straightforward policy action. This is evident both in how climate change is presented, and in what is left out. Climate change is presented through strongly scientific, technical and economic language. There is little or no discussion of people, other species or the environment; neither are climate issues seen as social issues. Politicians' use of science is also highly selective, with little discussion of abrupt or irreversible impacts, in contrast to both the scientific consensus and the Stern Review (IPCC 2007, Stern 2007).

Below I evaluate the use of corpus analysis as a methodological approach, before discussing the wider implications of the findings.

Evaluating corpus analysis for the study of politics

This study, as well as previous studies of different issues (Baker 2004, Perren and Dannreuther 2013), has shown the value of corpus analysis in providing empirical evidence of patterns of political discourse. Corpus techniques complement standard textual analysis, allowing researchers to identify particularities of language use. The main limitation of corpus analysis of Hansard is that it investigates how politicians present climate change in the public domain. Anonymised interviews with politicians would help to uncover the thinking behind the words, and examine the extent to which framings are conscious choices.

There are number of ways in which the method could be extended. It could be used to compare different discourses between political parties, or to examine how the language used to discuss an issue like climate alters over time, or between parliamentary settings: Is the language used by Select Committees, for example, significantly different? Comparison could also be made with policy proposals, such as White Papers or Reviews, to investigate how political framing of an issue influences subsequent discussions of policy.

This study examines a particular, and consensual, moment of climate politics in the UK; a comparison with, say, 2015 would be instructive, given threats to this consensus following the economic downturn (Skovgaard 2014, Carter and Clements 2015). The discourse of politicians could also be compared with language used by other groups, such as campaign groups or business groupings, to evidence different framings of an issue.

Taming the climate? Implications for policy and practice

This study shows that, rather than adjusting their worldview to accommodate the far-reaching implications of climate change, politicians instead attempt to adjust or tame climate change to fit into existing worldviews. This may be a well-meaning attempt to frame a difficult, complex issue into something amenable to the political agenda. Thus politicians who want to make progress on the issue present it as a relatively unthreatening, manageable problem. It may be that they face a tactical choice: to do this or not to discuss the issue at all. The only way that politicians can create a 'policy window', to use Kingdon's (1995) phrase, is to define the problem relatively narrowly, and present solutions that they believe will attract a viable level of support and maintain a consensus.

If, as this research suggests, politicians do indeed define climate change in a relatively narrow way, it would explain why, following Latour (2007) and Marres (2005), the issue called 'climate change' discussed outside Parliament is differently constituted from the one discussed inside Parliament. Outside Parliament, amongst activist groups, for example, or at international climate negotiations, the issue can be given free rein and the full political implications discussed; within the Palace of Westminster it is constrained into 'un-politics' (Crenson 1971) in order to be discussed at all.

There may also be a more profound reason for politicians' reluctance to discuss the more far-reaching implications of climate change. Politics, and indeed human society, has developed during a time of remarkable planetary stability. Anthropogenic changes threaten this stability, and call into question the continuation of the benign climatic conditions that have

underpinned our social life on this planet (Clark 2011). A full response to climate change would require discussion of this very fact, that a stable climate is a prerequisite for our political and social systems – what Donna Haraway calls 'a denormalisation of that which is normally held still' (Haraway 2014), or what Sarah Whatmore calls the ontological politics of 'posthumanism', a project 'that insists on the co-evolutionary embodiment and embeddedness of the human animal within the world' (Whatmore 2013, p. 34).

When confronted with an existential challenge on this scale, it is not surprising that politicians craft a more manageable conception of the problem. Yet the obvious caveat is that wishing climate change to be more manageable will not make it so. Framing climate change in this way may make it possible to address in Parliament, but it means that the full implications are ignored.

The evidence of this study suggests that it is very difficult for politicians to address climate change comprehensively within a formal Parliamentary setting, however necessary it may be to do so. Opening up debate within Parliament could be achieved through using different discussion spaces or types of debate, such as a 'national convention' on climate, and by encouraging robust engagement between politicians and climate advocates outside Parliament. A more explicit articulation of power relations and vested interests, which influence political framings of the issue (Oreskes and Conway 2012, Phelan *et al.* 2012, Geels 2014), could also help. The fossil-fuel divestment movement, now gaining considerable traction, is one example of this. Such initiatives could allow politicians to debate fully the implications of climate change, and build support for a more comprehensive political and social response.

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