Stability and Change in British Public Discourses about Climate Change between 1997 and 2010

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Abstract

Public understanding of climate change has been a topic of environmental social sciences research since the early 1990's. To date, temporal change in climate change understanding has been approached almost exclusively using quantitative, survey-based methodologies, which indicate that people's responses on a limited number of measures have indeed altered in response to changing circumstances. However, quantitative longitudinal evidence can be criticised for presenting an overly simplistic view of people's beliefs and values. The current study is the very first to explore changes in public understanding over an extended time period using in-depth qualitative methods. The study utilises a novel longitudinal methodology to explore changes in discourses across six separate datasets collected over the period 1997-2010, comprising a total of 208 public participants from across Great Britain. We find for the first time that discourses regarding the relevance of climate change to everyday life, and concerning rationales for personal action, have exhibited subtle but important shifts over this period. By contrast, other aspects of public understanding have exhibited considerable stability over time, particularly with respect to ethical principles concerning stewardship of nature, justice and fairness. We conclude by distinguishing between three scales of change in public understanding of climate change – relatively short-lived movements in attitudes as revealed by survey data and influenced by transitory phenomena; slower shifts in public discourses that track changing cultural contexts; and enduring ways of understanding climate change that are tied to longer-term ethical foundations.

Key words: public perceptions, climate change, climate ethics, longitudinal methodology

1. Introduction

Public understanding of climate change has been of growing research interest since studies began to emerge in this area in the 1990's. Much early research emphasised differences between public perceptions and the physical science basis of a changing climate. Topics examined subsequently include people's views on the broader societal and ethical implications of climate change; the role of direct personal experience of potential climate impacts in affecting attitudes; and the ways in which climate change as a global phenomenon can invoke 'psychological distance' and other forms of disconnection from the issue (for reviews see Weber and Stern, 2011; Pidgeon 2012a).

Against a background of this rapidly expanding field of study, it is surprising that relatively limited attention has been paid to the ways in which public understanding might have evolved over time. Given the exponential growth in scientific studies on climate change (Li et al., 2011a), and shifts in political attention (Bernauer, 2013) and media reporting on climate change (Boykoff, 2007, 2011; Carvalho and Burgess, 2005), it might be expected that public understanding would also have undergone transformation over time. Longitudinal work is important not only for highlighting trends in climate change understanding, but also provides a source of valuable hypotheses regarding the ways in which public discourses and beliefs may be shaped by wider dynamics of social contexts (in politics, media, and other spheres) which inevitably surround such a publicly contentious issue.

In recent years, some research has begun to explore changes over time through statistical analysis of data derived from opinion polling and other quantitative sources. On various polling measures, understanding and awareness about climate change have grown in many nations over the last 20 years (Lorenzoni and Pidgeon, 2006; Brechin and Bhandari, 2011), although in those countries for which detailed data are available there have also been a series of fluctuations in attitudes since the 1990's. Research in the USA points to a widening gap in perspectives since the late 1990's between supporters of liberal and conservative political parties (McCright and Dunlap, 2011), while in both the USA and UK measures of climate change concern decreased towards the end of the last decade, accompanied by an increase in the proportion of respondents expressing scepticism about the issue (Poortinga et al., 2011; Whitmarsh, 2011; Smith and Leiserowitz, 2012). Some studies have attempted to account for this recent decline in concern. Drawing on data from the USA, Scruggs and Benegal (2012)

point to the onset of the global financial crisis in 2008, noting that weakening belief in the existence of climate change closely mirrors unemployment rates. Also based on an analysis of USA data, Brulle et al. (2012) have argued that economic factors have competed with climate change for public attention, although these researchers ultimately conclude that the signals given by political elites best explain observed trends. Other authors highlight the role of the so-called 'Climategate' controversy, in which e-mails from climate scientists were posted on the internet in late 2009 (Pidgeon, 2012b; Leiserowitz et al., 2013), climate change 'fatigue' (Nordhaus and Shellenberger, 2009), and the role of periodic cold weather events giving rise to public doubts about the extent of 'warming' (Krosnick, 2010; cf. Capstick et al., 2014).

Most quantitative longitudinal polling on climate beliefs is restricted to a small range of key measurements thought important enough to repeat on national or international samples and polls: typically measures of concern, belief in an anthropogenic component, support for certain mitigation policies, etc. Although such data can identify certain long-term trends in relation to aspects of changed social and political contexts, it cannot in itself provide insights into how people's detailed understandings might have altered over time. In addition, much polling data and statistical analyses has been confined to the USA, meaning that trends in public perceptions of climate change in other parts of the world have by contrast tended to be overlooked (Capstick et al., 2014).

Wolf and Moser (2011; also Pidgeon 2012a) draw upon established arguments from the qualitative methodology literature in the social sciences to argue strongly that considerable added value derives from qualitative approaches that consider public views on climate change (using methodologies such as focus groups and interviews). Qualitative research can generate depth of explanation and insight into why people have the attitudes they do, the discourses they construct and draw upon, and the complexity of their understanding and emotional engagement with climate change. Published qualitative studies of climate change beliefs, primarily from within human geography and environmental sociology, demonstrate that people's understanding is culturally-embedded, and situated within broader conversations concerning such things as morality, justice, responsibility and trust, and in relation to people's everyday lives (e.g. Bulkley, 2000; Bickerstaff et al., 2008; Butler, 2010; Wells et al., 2011; Butler and Pidgeon, 2011). Related research maps the language, discourses and social representations used to make sense of climate change: for example, the ways people draw on 'linguistic resources' to explain their beliefs and actions (Kurz et al., 2005; Dickinson et al., 2010). Within social psychology, and drawing on a social representations approach, Smith

and Joffe (2013) have also examined the language used by people to understand climate change as a physical and societal phenomenon. What is missing in the literature, however, is any attempt to use qualitative data to investigate a temporal dimension to changes in public understanding of climate change. This situation is hardly surprising given the obvious resource constraints, and methodological complexity, of conducting repeated qualitative data collection and analyses. The present study aims to address this important gap in the literature by reporting the findings from a longitudinal analysis of six qualitative datasets obtained from separate programmes of research conducted in Great Britain over the period 1997-2010.

Longitudinal study designs may take the form of multiple waves of repeat interviews, but as this can pose logistical difficulties it is important that large qualitative studies which link together and reuse existing datasets should fill important research agendas (Henwood and Lang, 2005), as in the present study. Each of the datasets available analysed for the present study has in common the aim of exploring the perspectives of members of the general public on the personal and cultural dimensions of climate change. The analytic lens that we use for the longitudinal analysis across the datasets is discourse analysis, which is well-suited to exploring the wider ideologies and societal representations within which people's beliefs are located. As far as we know, this is the very first study of its kind to attempt to map the public's changing discourses of climate change over time.

2. Method

2.1 Overview of datasets and research methodologies

Six qualitative datasets were analysed for the present study. These comprised five pre-existing sets of transcripts (secondary data) and one original dataset (primary data). Each of the six datasets used here was selected for similarity and comparability across research designs. Each of the datasets was obtained through requests made to researchers originally involved in the work, or were able to be accessed due to one or more of the authors of the present study having prior involvement in that research. To our knowledge, none of the datasets used were publicly available at the time of writing, although peer-reviewed studies have been published from each of the research projects for which they were obtained.

Table 1 provides a summary overview of the datasets considered, showing the number of participants involved at each time point, and number of group interviews or focus groups

carried out, where relevant; for the 1997/8, 2002 and 2010 projects each group met on more than one occasion. In total, 208 members of the public participated across these research projects.

Table 1 about here

All participants involved in these different research projects were non-specialist members of the general public, who took part in semi-structured discussions around climate change and related topics. Each of the research projects used open-ended questions designed to obtain participants' views on climate change, and each project's data collection drew on broadly similar interview protocols. Whilst not an exhaustive list, table 2 provides an overview of some of the main themes which overarched the original projects, and which were subsequently incorporated into the approach used for primary data gathering in 2010. Example questions used by moderators are also given.

Table 2 about here

Despite the broad similarities between the original studies, there were nevertheless some differences in sampling approaches and data collection techniques. Participants contributing to the earliest dataset (1997/1998) were professionally recruited to be broadly demographically representative, with discussion groups incorporating interaction with experts (e.g. a council planning officer). Participants contributing to the 2000 dataset took part having indicated their willingness to do so via a postal survey, and were subsequently organised into four homogenous groupings according to their reported views on the causation and importance of climate change, with future climate change scenarios used to focus discussions. For the 2002, 2007 and 2010 data collections, participants were professionally recruited from within a fixed catchment area – usually the city/town in which participants lived – to obtain a mix of ages, gender, and occupational background, with data collection following a focus group format (in the case of the 2007 data collection, discussions were additionally organised by male, female, and mixed gender groups). In the case of the 2003 dataset, participants were interviewed individually or in pairs and comprised an opportunity sample.

The most recent and only primary dataset, from 2010, was obtained using methods designed to be commensurate with the approaches used in the 1997-2007 projects, and entailed semi-structured group interviews facilitated by the first author of the present study. The 2010 dataset was obtained principally for the purpose of extending the time period available for comparative analysis of public perspectives on climate change. In developing a research protocol for the 2010 research, the earlier projects' interview protocols were reviewed; all pre-existing transcripts were also revisited to identify the questioning and procedures used by the original researchers, with these adapted for contemporary data collection.

2.2 Discourse analytic approach and addressing variability in research contexts

The present study adopts an epistemology designed to be compatible with the similar (but not identical) research designs described above. This we achieve through conceptualising public understanding in terms of discrete and coherent climate change discourses. Whilst the meanings and implications of 'discourse' are highly variable (cf. Van Dijk, 1997; Wetherell et al., 2002) for the purposes of the present study we recognise a discourse as comprising the following key features: (i) discourse is *socially-shared* – that is, ways of representing climate change are commonplace such that they may be readily identifiable in unrelated settings and across multiple research projects; (ii) discourse is *patterned* – it comprises recognisable and recurrent metaphors, rhetorical devices and concepts; (iii) discourse is *purposive* – it serves functions in interaction and can be used by people for particular ends. In considering climate change discourses in these terms we draw on the approaches of authors such as Dryzek, who has conceptualised discourses as "shared ways of apprehending the world" (Dryzek, 1997:8), and Myers (2007) who has drawn attention to 'commonplaces' which are widely recognised within a culture.

Importantly, these three features if discourse are not contingent on the immediate contexts in which interaction occurs. Effectively, the climate change discourses we identify and discuss do not 'belong' to any individual or situation – rather, they are generalised ways of comprehending climate change that can be readily drawn on by people to interpret, describe, argue etc.

Nevertheless, and as we note above, although each of the original studies used similar methodologies, they featured different participants and moderators, and to some extent different study objectives. This presents the challenge of identifying differences between

datasets which arise from more than the particular features of original methodologies and research sites.

The principal means by which this has been dealt with is through adopting an analytic approach which differentiates between 'proximate' context on the one hand – the immediate and unique characteristics of a particular discussion, such as disagreement between participants or particular reference to a person's circumstances – and external or 'extrasituational' context, on the other – the wider and shared frames of reference within which talk is contextualised, such as concerning people's understandings of personal conduct as part of wider cultural patterns (Wetherell, 2002; cf Schegloff, 1992).

In the present study, we have thus set out to identify how climate change is understood in ways which go beyond particular proximate contexts, whilst attending to the ways in which these broader discourses have varied or remained constant over time. In keeping with this approach, we have not sought to connect climate change discourses to any personally identifiable characteristics of research participants such as age, gender, location, or political orientation. For the most part, such information was in any case either unavailable or limited, and so was not feasible to include within the scope of the present analysis.

2.3 Qualitative longitudinal analysis

The present study is unusual in seeking to draw out commonplace discourses evident across multiple datasets and research projects, at the same time as characterising change and continuity in these over time. Despite the large number of studies that now exist concerning public understanding of climate change, to our knowledge there has as yet been no previous attempt to consider a temporal dimension to public understanding through the use of qualitative data and methodologies.

In recent years there has been growing methodological interest in qualitative longitudinal research as a novel and developing paradigm within the qualitative social sciences (Henwood et al., 2012). These approaches aim to elucidate dynamic patterns of change whilst remaining attentive to questions of textual interpretation, for example, how meanings can be reworked in discourse (see e.g. Coltart and Henwood, 2012).

To enable us to carry out the analysis for the present study we have adopted a two-stage approach. The use of discourse analysis, as outlined above, has allowed the identification of a

set of general discourses concerning participants' portrayal of climate change across *all* datasets/years. Next, we undertook analysis to attend to commonalities and variations *within* these discourses over time. This proceeded in line with the principle of comparative analysis in qualitative research (Boeije, 2002) to ascertain which elements of a discourse were common to one dataset but not another, via repeated readings of transcripts and negative case analysis (Henwood and Pidgeon, 1992; Miles and Huberman, 1994). The datasets were treated in chronological order to achieve this, with a recognition that some are closer in time than others; hence, at times we refer to 'early' (1997 and 2000) or 'recent' (2007 and 2010) data where making distinctions between datasets.

2.4 Data coding and analysis

Whilst it has been argued that codes connected to original transcripts have the potential to afford useful insights into the re-analysis of secondary data (see Medjedovic and Witzel, 2005) other researchers have instead stressed that 'bespoke' analytical frameworks are important to develop, entailing data coding appropriate to the purpose of any new analyses (Henwood et al., 2010). In practice, this latter approach was necessary to adopt for the present study: coding procedures and codes were not available for all datasets (or were described only briefly); and where original coding approaches were reported these varied substantially according to the original researchers' disciplinary backgrounds and preferred orientations. For these reasons, the coding of the datasets for the present study thus began with a 'clean slate' whereby the original transcripts were examined in isolation from any coding or other notation provided by previous researchers.

The approach taken to the analysis and coding of transcripts for the present study was as follows. In the first instance, a preliminary coding of a sub-sample of 50% of transcripts available was carried out in order to identify key themes present across the datasets. This proceeded according to the principles of 'open coding' commonly used within grounded theoretical approaches (Charmaz, 2006). Having identified unifying features across the different datasets, the main characteristics of the discourses and their component parts were classified. This was carried out in line with the environmental discourse analytic approach designed by Dryzek (1997) and applied also by Hulme (2008) and Segnit and Ereaut (2008) in the context of climate change. Dryzek's analytic approach entails attention to the grouping

together of recurrent metaphors, rhetorical devices and other abstract concepts within an over-arching 'ontology' which recognises and emphasises particular features of the world.

Having identified and named a series of climate change discourses, each of the transcripts from the 1997-2010 period were then comprehensively coded and organised in the following manner:

(i) Sections of participant talk were coded (highlighted and linked to a 'node' in NVivo analytic software) according to the discourse to which they corresponded; transcripts were similarly coded according to discourse features and component parts;

(ii) All excerpts of participant talk corresponding to a particular discourse were extracted (the data as a whole was re-organised by discourse rather than in the original form of verbatim discussions)

(iii) Each discourse-specific set of participant talk was subdivided by year, to produce six subsets of transcript excerpts for each discourse;

(iv) Comparison was then made of excerpts *within* a given discourse and *between* datasets/years, to assess change and/or continuity of discourses over time.

We focus our analysis and reporting in the present study on three discourses, identified across the six datasets and considered in detail in sections 3.1 to 3.3. Each of these discourses concern people's understanding of the human dimensions of climate change – for example, concerning the location of responsibility for emissions reduction, and the relevance of intergenerational ethics. This approach enables us to reflect upon change and continuity in public discourses of climate change at different scales and in different domains – sociocultural, individual, and ethics-based – whilst remaining faithful to the research emphases of the original studies.

3. Results: Continuity and change across the climate change discourses

We now consider the ways in which public understanding of the various facets of climate change – as revealed by the climate change discourses identified – have shown continuity and change over the 1997-2010 time period.

We examine three discourses in turn, and integrate discussion of how wider contexts (e.g. regarding politics and the media) are reflected in the change or lack of change over time in public perspectives. First, we consider public perspectives on the social and cultural contexts of climate change, particularly the means by which contemporary ways of living are seen as both constraining and enabling action on mitigation. Second, we look at how climate change is understood in personal and behavioural terms, for example the ways in which individual (in)action on climate change is accounted for. Third, we examine people's perspectives on the broader ethical questions that climate change gives rise to. Whilst we discuss in detail the temporal nature of these discourses in sections 3.1 to 3.3 below, the changes and continuity observed are shown in summary in Figure 1.

Our use of transcript excerpts is necessarily selective, but we have aimed to be faithful to the broad commonalities and trends identified. In attributing quotes to participants, each is assigned a unique code reflecting their position within a research project ('P1-', 'P2-' etc.) and the year of their participation (e.g. '-2007')[1].

Figure 1 about here

3.1 Lifestyles and cultural practices: the incorporation of climate change into everyday life

The first discourse we consider concerns the ways in which climate change is understood as a cultural and societal phenomenon – as arising from, perpetuated by, and/or addressed by contemporary ways of living.

Within this discourse, climate change is contextualised through ideas such as consumerism, capitalism, materialism, and Western and 'modern' society. This discourse runs throughout the six datasets, with subtle shifts in emphasis over time. Participants in some of the earlier studies argued for example that "the Western world has contributed to climate change through… the lifestyles that we have" (P18-2000) or that climate change is caused by a "way of living... linked in with the way economies work and the way societies work" (P19-2003). Similarly, in the most recent data, P43-2010 remarks: "that's the fundamental basis of it,

[1] For example, participant P14-2007 is participant 14 within the 2007 dataset.

[climate change] is getting worse because of the drive for profit and over-consumerism". The actions of individuals are implicated within such a cultural context through assertions such as that excessive resource use has become endemic in 'throwaway society' – this exact term is used by participants in three separate research projects (2000, 2007, 2010) to explain the connection between widespread deleterious cultural practices and climate change.

A commonly used metaphor is that of 'pressure' – with respect to time, finance and work – which depicts the constraints and demands upon people which inhibit action on climate change. P18-2000 for example attributes to work pressures the need for a car, noting that: "the working world has got incredibly tough in this country… climate change takes time. If you're going to cycle sometimes that takes longer than if you drive"; likewise P62-2007 suggests that she does not attend to energy conservation in the home "because life is too fast… trying to do ten things at once", and P41-2010 explains that "with the pressures of our lifestyles and our time and money and our resources… I could walk to [the supermarket] but I don't because I don't have the time".

In their depictions of the relationships between contemporary culture and climate change, participants often compare ways of living between the present and past to explain why problems have emerged. For example, participants across research projects refer to changes over time with respect to growing reliance upon cars for travel, as illustrated by the following excerpts from 2003 and 2007:

> When I was growing up… you went to shops where you were and you bought things. Nowadays it's a pretty automatic reaction for lots of people, jump in the car and go to the out of town shopping centre (P13-2003).

> People used to work where they could walk to their work. Now they drive fifty miles across the country and back… a car wasn't a necessity fifty years ago (P52-2007).

These sorts of interpretations by participants are congruent with depictions in the social practice literature (e.g. Barr et al., 2011; Halkier et al., 2011) whereby the importance of socially-shared meanings (such as the speed and pressure of modern life) and routines typical to many (such as the 'automatic' tendency to rely on cars) are emphasised as factors underlying overconsumption and climate change. Of interest to the present study, moreover, are the ways in which such characterisations of lifestyles as routine-driven and socially organised have changed over the time period spanned by the datasets. In particular, we

identify a shift in emphasis over time with respect to the ways in which *positive cultural change* is characterised across the datasets.

In the earlier datasets (1997 to 2003) there is little reference made to cultural conditions that might support responding to climate change. In the more recent data, however, an emergent emphasis upon the perceived *normalisation of pro-environmental lifestyles* is identified. Across the 2007 and 2010 datasets, in particular, participants portray changes in practice considered beneficial in addressing climate change. An illustration of this is given by P34-2010 who notes that "society is changing its behaviours... the amount that we are recycling now than we were five years ago... [this] is something that the general public have done because they're more educated about it". Likewise, P79-2007 contextualises changes in practice with respect to energy use in the home: "Two or three years ago, turn[ing] lights off, I don't think people cared as much. I think because of all the media attention and hype that's got to have changed most people's views on power and energy".

As with P34-2010's assertion above that 'society is changing its behaviours', other participant remarks from the recent datasets point to a view of societal change as a recent and dynamic/ongoing process. Thus for example P22-2010 refers to the approach of schoolchildren to recycling, noting that "all the recycling things, it's become a way of life to the next generation". Such reference to a 'way of life' implies the view that this has become a routine, unquestioned activity. Likewise, a separate reflection is made by P22-2010 on the contrast between a previous separation between everyday life and 'green' issues, compared to a more contemporary integration:

> I think that [previously] it was an issue that stood apart from your life, and that you made certain changes to be green, rather than that they were what you did in your everyday life, which is the way that I think people approach it now... now it's the everyday, make sure that you know why's that cardboard going in the bin rather than in the recycling.

The identification of these perspectives, in which environmental practices are considered to be developing in propitious terms society-wide, is a novel finding of the present study. This shift in emphasis indicates a change in public understanding of the cultural dimension of climate change: from a situation in which the social context of action is portrayed as *predominantly deleterious* for climate change, to one in which a *positive component* is also recognised. This change in perspective can be thought of as reflecting a change in one key

element of practice, namely individuals' understanding of what constitutes appropriate or 'normal' conduct within a culture (Warde, 2005; Gram-Hanssen, 2011).

As to what may have underpinned this change in perspective, it is likely relevant that the time period spanned by the datasets corresponds to a time in which sustained efforts have been made to bring about changes in consumer behaviour. In the UK, policies towards household waste collection and recycling have been argued to constitute some of the most radical changes to policy for over a century (Bulkeley et al., 2007). Advocacy by social movements of private sphere environmental action (Hadler and Haller, 2011) and media promotion of activities such as recycling (Inthorn and Reder, 2011) may also have played their part in influencing changes in conventions – what Barr et al. (2011) describe as the intrusion 'from above' of political discourses into the construction and discussion of daily routines.

3.2 Accounts of personal action: reconciling structural and moral pressures

Whilst participants readily relate everyday action to wider social and cultural contexts as described above, at other times the focus for explanations is upon action at the individual, subjective level. The second discourse considered here concerns participants' explanations for their *own* behaviour, by means of accounts of why environmentally significant actions are (or are not) undertaken.

Across the time period 1997-2010, one commonplace way of accounting for behaviour is through reference to *external or structural factors* determining or constraining personal choices. A recurrent example concerns reference to financial or time 'cost', whereby action is portrayed as the least expensive or time-consuming option. Thus a participant's careful electricity use can be explained as occurring "to keep the bills down" (P9-2000), whereas reference to time constraints is made where P18-2000 argues: "to me, there is a... cost-benefit. If it costs me so much to recycle then in terms of my time, I can't do it". Likewise, a common way of explaining behaviour is through reference to lack of capacity to act due to *structural constraints*. P21-2003 for example explains energy consumption in terms that "the heating is always on, we have no control over that"; P75-2007 accounts for car travel to work from there being "no other way of getting there"; and similarly P18-2010 explains that for his work "I had to drive because there were no buses at that time".

Whilst these types of explanations are not in themselves surprising, and persist over time, there is an additional component to people's explanations emergent over time, in the form of participants' increasingly accounting for their actions through reference to *personal morality*.

One way a moral dimension to personal choices is often revealed is through participants' *pejorative self-appraisal* of their inaction – with criticism of one's own behaviour implying a falling short in attaining a desired standard. An example of this is P2-2002's attribution of her lack of pro-environmental behaviour to personal deficiencies:

> I'm one of these selfish Western people… I'm so selfish and very complacent… I've always left [the television] on standby. I don't think of the emissions from the fridge, I don't save water, I don't do anything like that… I just live in my own little world.

Other examples include P21-2003's description of himself as "hypocritical because I drive my car too much… and I'm not overly concerned about how much power we use in the house"; with P73-2007 likewise explaining their car use due to being "lazy" and not having "had the guts to change [mode of travel]".

In addition to such self-critical accounts, the later datasets also contain depictions of behaviour arising from *pro-environmental motivations*, including participants talking of being 'conscious' of action, 'thinking', and being 'aware' of the environmental significance of behaviour. Examples of this are noticeable particularly within the 2007 and 2010 datasets, as in the following excerpts:

> [Y]ou're conscious about how you feel about doing things… I don't drive anywhere, I'm quite happy to walk and catch a bus... I would do anything, if I possibly- within my power I would do anything to help. (P6-2007)

> I've become in the last few years more aware than… any physical thing that I buy, it's food miles. It's the concept of looking at things and thinking: 'why do I need to buy something that's been flown from New Zealand?'… I consciously look for the things that are grown locally. (P27-2010)

Such attempts to explain behaviours in these ways may often relate to demands of self-presentation typical in interactional contexts (Buttny, 1993). However, such justification can also be considered part of an emergent set of discourses around climate change, such that over time there has developed the idea of a morally 'correct' way to act in a personal capacity towards this issue. This manner of accounting for behaviour first emerges in the 2002

transcripts; datasets prior to this were revisited and there is little or no evidence of such accounting for individual action in this way in common domains such as travel, home energy use or consumption. Additionally, moralised accounts as revealed through participants' pejorative self-appraisal feature with particular prominence in the more recent (2007 and 2010) datasets. P41-2010 for example remarks, "are we all hypocrites? I am. I mean, I grow my own vegetables... but my heater's on at the moment!" and P31-2010 that "I do feel guilty, that I don't take enough interest in [climate change]. I probably don't do enough... I don't do as much as I should".

The surfacing of a requirement to justify personal choices in this way may reflect the advance over time of an 'internalisation' of political rhetoric around individual responsibility regarding climate change (Bickerstaff et al., 2006), as well as what Butler (2010) has depicted as the 'moralisation of behaviour' in the context of climate change. A deliberate effort by government and others to promote individual responsibility in this area has been identified – and indeed critiqued – by a number of authors (e.g. Maniates, 2001; Pidgeon and Butler, 2009; Shove 2010). Participant perspectives in the present study suggest that people's accounting for their actions in these terms may manifest in a number of different ways: these include reflections on action driven by personal values, but also the questioning of one's own integrity or capabilities.

In addition to these accounts, are those in more recent years emphasising a tension – and often awkward reconciliation – between competing demands, pressures and aspirations. A variety of accounts from 2007 draw attention to personal action seen as *reasonable and possible* given one's situation. Thus P4-2007 asserts that "with a one and a three year old… I do…what I can do within my home" and that "we're doing just as much as we can… but… I haven't got [the] power"; P2-2007 similarly argues "don't get me wrong, I do everything I'm supposed to do" even though the view is then expressed that this may not be efficacious.

In the most recent data, this contrast between perceived obligations and external pressures is likewise evident in P26-2010's telling account of supermarket visits: "I don't think about morals when I have to go round the supermarket… it's time versus cost. I get as much in before the kids start playing up and then get to the door". Likewise, P12-2010 characterises her actions as a compromise between competing pressures, noting that "what I do allows me to not feel guilty basically. I drive most places, but I'll recycle, and in my head that's a kind

of parallel". P35-2010 similarly portrays his choices as a balance between intentional pro-environmental action and a desire for comfort and convenience:

> I recycle everything that can be. But, I drive a three litre diesel [because] it's damn comfortable... And as much as I try and do all my bits and be as good as possible, I'm not that great. And I will jump on a plane without thinking about it.

Accounts such as these suggest that rather nuanced positions are now able to be arrived at by people in terms of explaining their actions in the context of climate change. It has elsewhere been argued that whilst people do recognise personal responsibility for climate change, they also acknowledge their failure to enact this (Shirani et al., 2013). The longitudinal analysis of the present study suggests that an emergent property of this tension is a reconciliation between the acceptance of personal responsibility on the one hand, and the competing demands in other areas of life on the other.

This reconciliation is reflected in the account of another 2010 participant who justifies her choices through asserting that her time is 'precious', and that in a wider context ('compared with China') they are essentially negligible. Normative pressures (her account is anticipated as sounding 'selfish') are recognised, but nevertheless her actual choices are portrayed in a reasoned and pragmatic manner:

> My time is quite precious to me. I know how selfish that sounds, but I sometimes think to myself: do I want to spend this time running up and down? ... In the back of my mind I'm going: 'well, what's my impact compared with China?' … It's not healthy for one person to think like that, but... in the back of my mind I can counter it with: 'yes, my little bit might be impacting towards it, but also it might not be impacting that badly against it'.

3.3 Climate change ethics: Intergenerational obligations and fairness considerations

As discussed above, an ethical dimension to behaviour in the context of climate change is increasingly invoked across the time period. More generally, a wider set of ethical principles is associated with climate change across a range of contexts. Here we consider a discourse of ethics in its own right, through which many participants interpret climate change.

The application of ethical principles across the datasets encompasses notions such as intergenerational obligations and human responsibility for the natural world, as well as conceptions of justice and fairness, and is used to draw conclusions and present arguments about what constitutes proper or justifiable conduct. These wider discourses appear remarkably unchanging over the time period studied.

One theme commonplace across the datasets is *stewardship*. This is portrayed as an ethical obligation to protect the planet and its environment, and by extension the climate. Stewardship is often asserted in rather general and normative terms – as an absolute principle to which people should adhere. As P5-2000 asserts:

> I was brought up to believe that you came into this world and you lived in it for a certain length of time but then you were the custodians of this world… you [have] a great responsibility towards it and how you [leave] it.

Similarly P52-2007 argues "we have a duty to protect [the Earth]. We don't have a duty to change it or destroy it, we have a duty to protect it" and P44-2010 that "we should start taking… responsibility for the whole planet". The problem of climate change may be directly related to a failure to act on this ethic, whereby "we the human, the inhabitants of this community… are out of synch with nature, have abused our custodianship" (P4-2003). Likewise, P17-2010 argues that the dominance of 'money' and 'greed' is at the root of the problem of climate change:

> Money and trade are the two main factors of why all this- going back to climate change- I think… a general overall worldly greed for certain things has made [people] not really take care of nature as such.

The idea that moral duty extends beyond one's lifespan, recurs in many instances across the datasets. For example, P16-2002 asserts "for my lifetime it probably won't matter, but obviously it's of concern for the future of the planet", and P47-2010 that "when you're dead and buried, [material concerns] mean nothing. You want to be creating something for future generations".

This forward-looking perspective entailing obligations towards future generations is contextualised – and personalised – in many places to participants' own real or future family lineage. Thus P5-1997 explains "my concern basically is a very human concern. What about my grandchildren and what about their children, what are we doing to preserve the world for

them?"; and P14-2000 that "I think [climate change] is very relevant for my grandchildren which I'd like to do something about".

Whilst arguments for intergenerational ethical obligations in the context of climate change have often been made in the academic literature (e.g. Davidson, 2008; Page, 2006; Okrent and Pidgeon, 2000), the recognition of a salient intergenerational ethic within the public's own understanding of climate change has been little articulated (Markowitz and Shariff, 2012). There has been a tendency instead to emphasise the relative *absence* of immediate personal concern about climate change, in large part because impacts are seen as situated in the far future (Lorenzoni and Pidgeon, 2006; Spence et al., 2012).

The presence of an intergenerational ethic within public perspectives goes some way to reconciling these two positions: that whilst climate change may not be considered directly relevant in the here and now, a sense of obligation is nevertheless present towards future lives which are anticipated to be significantly affected. This emphasis upon intergenerational ethics asserts a duty to act *in spite of* the limited immediacy of climate change; in this, public understanding of climate change mirrors broader sustainable development discourses emphasising obligations to future generations (Haque, 2000).

A second ethical framework through which climate change is commonly understood, is in terms of *justice and fairness*. However, whilst ideas in respect of stewardship are used exclusively to make the case that action on climate change is required, justice and fairness arguments are at times presented in terms of a moral dilemma: action on climate change may sometimes be seen to be in direct contrast to justice considerations.

An important case in point is the argument that international efforts to address climate change may unjustly impinge on economic development for less developed countries. This is articulated by P15-2003: "You're effectively asking… developing economies not to develop because basically we've caused climate change… it's a double standard argument". Similarly, P65-2007 argues "China and the other developing nations are… saying 'well you've done your development now, you've done your polluting… it's not morally equivalent, we've got to do some catch-up'"; and P7-2002 that "these countries… they all want what we've got, and you can't blame them".

The consequences of climate change are themselves seen as breaching principles of social justice. P5-2002 for example notes in an international context, that those less responsible for climate change are nevertheless those who 'suffer' through being unable to adapt/respond:

> We'll get in our cars and we'll drive somewhere else. They can't do that, they can't up-sticks and move… they haven't got the means to move to another town or sell their houses... so I feel that they suffer quite considerably because we don't live that life.

P65-2007 (also quoted above asserting countries' right to develop) notes similarly that "the very poorest people… don't consume enough resources and have enough power to be polluters, and they're quite often disproportionately the victims"; likewise in a 2010 group, P9-2010 proposes that "it doesn't matter what issue you're talking about, it affects poor people most".

Questions of justice and fairness at an international scale are also applied in the particular context of carbon trading schemes, either spontaneously or where deliberately presented as a policy option to participants. Such mechanisms are for the most part seen as failing to meet an ethic of justice and fairness. P17-2003 explains this as follows: "when America sells its share of pollution to a country that doesn't create much, and says 'oh we can create more, because that counter-balances what you don't create' – things like that strike me as very unfair". Likewise, P16-2010 argues that "I think [carbon trading] is immoral basically. It's the rich trying to share their guilt and their burden onto the poor".

As in the case of the environmental stewardship and inter-generational obligations, concepts of justice and fairness have been well-explored in the literature concerned with climate policy (Klinsky and Dowlatabadi, 2009) and formal applications of ethics (Agyeman et al., 2003) – and yet the public perceptions literature has rarely focussed directly on these matters (Klinsky et al., 2012). Whilst a growing body of work suggests that broader values do underpin attitudes and action towards climate change (Corner et al., 2014) such studies rarely afford insights into the particular ethical rationales that people discursively adopt (though see Howell, 2013, for a discussion of the ways in which more committed individuals articulate value-based motivations).

The comparative analysis of multiple datasets across the extended time period of the present study, suggests that there has in fact been little change over time in how such principles are applied by public participants. Inasmuch as ethical principles can be considered universal and largely stable over time (Haidt, 2007) it should not perhaps be surprising that these types of ethical arguments applied to appraise climate change are largely similar across research projects. We suggest, however, that this continuity is itself significant and has been

overlooked in the literature thus far. Particularly given that much recent research attention has focussed upon downward shifts in levels of concern about climate change, it is important to be mindful that these do not necessarily signal changes to the underlying ways of appraising the ethics of climate change. In other words, beneath the ripples of fluctuating public concern, are more fundamental and durable ways of understanding which are profoundly concerned with a sense of right and wrong, with respect to how we as individuals and societies respond to climate change.

4. General Discussion

4.1 Use of qualitative longitudinal methodology

Our analysis has considered the ways in which public discourses about climate change have remained stable and varied over time. Our use of qualitative longitudinal methodology has enabled original types of insight to be generated into a large and time-sensitive series of datasets. This said, our use of qualitative longitudinal methodology is part of a novel and developing paradigm with no unitary methodology (Shirani and Henwood, 2011; Henwood and Shirani, 2012) and so we draw attention to certain outstanding issues and limitations associated with it.

First, we have considered it appropriate to treat public representations of climate change as discrete discourses which transcend particular situations, and yet which may vary over time as part of wider cultural contexts. Nevertheless, the possibility exists that differences between sampling approaches, and/or idiosyncracies within certain group discussions, research protocols and materials, may have influenced the original datasets – and hence affected conclusions drawn about changes over time in public understanding.

One way in which this problem can be addressed, in part, is through the consideration of datasets from multiple projects and years where formulating interpretations of change, as in the present study. Where conclusions are based on participants' perspectives spanning several independent research settings and projects, then it can be asserted with some confidence that these are likely to be more than simply an artefact of the original research designs. This said, and given that it has not been possible to 'control' for variations across research designs, the risk of the findings having been influenced in this way cannot be entirely discounted.

A second methodological issue concerns the role of the researcher in the qualitative analysis of data. With the exception of the 2010 dataset, the analysis and coding of transcripts has been undertaken by a researcher (the first author of the present study) with no prior involvement in the research design and data collection procedures of the relevant projects. As such, it has been necessary to treat the transcripts as a form of secondary data. Heaton (2000) has suggested that precisely because for some qualitative approaches the meaning of data is connected to an analyst's proximity to the subject of research (e.g. in ethnographic work) this cannot then be reproduced by a second researcher. In the case of the present study, it would not have been possible to reproduce the researcher reflections and analytic insights – that which Ottenberg (1990) terms 'head notes' – which arose for those researchers more intimately involved in discussion with their projects' participants. It has instead been necessary to treat each of the transcripts as self-contained data in their own right, and to approach these in a manner akin to a textual analysis. Through doing so, we can be confident that each of the original research projects' datasets have been treated in an equal and equivalent manner – however, this has of necessity meant that the types of tacit knowledge and nuanced observations available to the original researchers have been omitted from our analysis.

4.2 The pace and nature of change in public understanding of climate change

We have argued that over a fifteen year time period, the personally and socially relevant aspects of climate change have gradually found purchase in people's understanding of everyday life from the late 1990's to the end of the 2000's. Given the development of a range of communications around climate change (Moser, 2010; Pidgeon, 2012b), an increase over time in the volume of media reporting (at least until the mid-2000's: Boykoff, 2011), and growing attention to 'green issues' and sustainable consumption over the past two decades (Zaccai, 2012), this is perhaps to be expected. However, these broader trends cannot straightforwardly explain participants' interpretations as we outline them in the present study, given that these display both substantial durability, as well as some important and subtle shifts, during the evolution and emergence of the subject of climate change.

First of all, our analysis of discourse around everyday life and cultural practices suggests that there has been a move over time towards integrating some pro-environmental activities within the rubric of what is considered to be 'ordinary' or expected. This may reflect the slow

cultural shifts by which novel behaviours such as recycling or energy conservation are subject to a process of 'social normalisation' (Rettie et al., 2012) – whereby previously conspicuous activities gradually become accepted as mainstream. Likewise, in the personal domain the growing application of a moral dimension to otherwise mundane activities (see also Butler, 2010) indicates that climate change has over time come to be seen, in the UK at least, as one in which there is perceived individual responsibility to participate. With respect to this, it is important to note that authors such as Karlsson (2012) and Raterman (2012) have been critical of such ascription of responsibility at the individual level precisely because they lead to what these writers have respectively termed 'fashionable guilt' or 'bearing the weight of the world'. Our findings thus resonate with work that has identified associations with guilt and other negative emotions in relation to personal action, and even a reaction against the rhetoric of 'sustainable lifestyles'. However, our analysis goes further by pointing to a role for counter-discourses that enable reconciliation in people's accounts between competing pressures, so permitting compromises within the spheres of everyday activity and cultural sense-making.

The incorporation of the large-scale, complex issue of climate change within the fabric and multiple demands of everyday life is something which has taken time – and which will likely continue to progress in a protracted manner. Our study suggests that many of the ways in which people express their views about climate change have actually changed little over the time period studied. On the one hand, this apparent intransigence in the public's perspectives on climate change might be seen as troubling. After all, the science is increasingly clear that the avoidance of dangerous climate change through emissions reduction must be achieved as a matter of urgency (Anderson et al., 2008) and that engagement by members of the public in demand reduction will be critical to achieve this (Spence and Pidgeon, 2009; Höppner and Whitmarsh, 2011). On the other hand, there is a recognition in the social sciences that achieving change in the sustainability domain can, in reality, represent a "slow and humbling process" (De Young, 2011:608), with social norms and perceptions of responsibility often evolving only gradually over several decades – or even longer. Because of this inherent inertia, it is possible that where changes to the social contexts to behaviour *do* occur these could be durable over time, however.

This brings us to comment on the distinction between the findings we present here, and previous studies examining changes in public understanding of climate change. Longitudinal research on public opinion has typically done so through analysis of polling data over time

(e.g. Brulle et al., 2012; Scruggs and Benegal, 2012). Whilst useful for understanding some dynamics of public opinion (i.e. by treating 'concern' and 'belief' measures as outcome variables), these types of attitudes may nonetheless be of a kind which are particularly volatile or are not held with much certainty by respondents (Poortinga et al., 2011; De Young, 2011). Consequently, the misleading impression may be given that 'public opinion' on climate change is malleable and capricious. This in turn may lead to unease among the research and policy communities in instances where levels of 'belief' or 'concern' appear to reach a nadir (Leiserowitz et al., 2013; Corner, 2011).

In contrast to this body of research, the present study paints a different type of picture about public understanding of climate change and its temporal nature. We suggest that even as the sorts of indicators referred to above have risen and fallen, behind the scenes a more subtle and gradual process has unfolded whereby the perspectives people hold on social conventions and their own actions have evolved in a less obvious way. Within this framework, it is entirely possible to conceive of a situation whereby overall public 'concern' about climate change may fall over a period of time – perhaps due to economic pressures competing for people's attention (Weber, 2010), or perhaps because of issue fatigue (Nordhaus and Shellenberger, 2009) – but where nevertheless the social contexts which form a backdrop to public engagement have shifted in a different direction. One example of a 'normalisation' of behaviour often referred to by participants in the present study is that of recycling, seen as more routine by participants in the recent data than previously. The perspectives offered on this changed set of social practices are commensurate with data demonstrating that actual rates of household recycling across the UK have shown a persistent annual increase (Defra, 2010) even as concern about climate change and acceptance of its reality has both risen and fallen in the UK since the mid-2000's.

One area in which substantial continuity is observed in public perspectives concerns the ethical principles applied in the interpretation of climate change. These relate to a duty to take care of the natural world, to intergenerational obligations, and to notions of justice and fairness. From the analysis carried out for the present study, it would appear that these conceptions of ethics are constant across the time period 1997-2010. This observed stability likely reflects the very slow rate at which society's values change over time: as Inglehart and Baker (2000) argue, the impact of a society's historical and cultural heritage is profound, with major changes in values occurring only on generational timescales (see also Inglehart, 2008). Nevertheless, whilst ethical perspectives applied by participants to understand climate change

do not show movement over time, they are concerned inherently with considerations of temporality: for example, arguments are made that action is required now to ensure a sustainable future for people yet to be born. In this way, ethics is applied in such a way as to incorporate 'temporal extension' into an anticipated future society (Shirani et al., 2013).

In conclusion, we argue that three scales of change can be distinguished within public understanding of climate change, where this is considered across previous research and within the present study. First, as revealed by previous and ongoing quantitative survey research, is the volatile and changeable nature of public opinion, which may vary month by month, or even day by day (cf Li et al., 2011b). Second, as revealed by the present study's qualitative longitudinal analysis of discourses around personal action and cultural contexts, are the more gradual and subtle changes which occur over periods of years and decades, and which are only observable through detailed and long-timescale studies. Third, are the most durable and fundamental ways of understanding climate change: these are concerned with ethics and value-based conceptions, which are likely to evolve at timescales longer even than the length of time for which there has been widespread public awareness of climate change. Each of these three paces of change are significant and consequential in their own right, and all form part of the wider context within which society as a whole interprets climate change.

References

Agyeman, J., R. Bullard, and B. Evans. 2003. *Just Sustainabilities: Development in an Unequal World*. Cambridge, Massachusetts: MIT Press.

Anderson, K., A. Bows and S. Mander. 2008. 'From long-term targets to cumulative emission pathways: Reframing UK climate policy'. *Energy Policy* **36**(10): 3714-3722.

Barr, S., A. Gilg and G. Shaw. 2011. 'Citizens, consumers and sustainability: (Re)Framing environmental practice in an age of climate change'. *Global Environmental Change* **21**: 1224–1233.

Bernauer, T. 2013. 'Climate change politics'. *Annual Review of Political Science* **16**: 421-448.

Bickerstaff, K., P. Simmons and N. Pidgeon. 2006. *Public perceptions of risk, science and governance: main findings of a qualitative study of six risk cases. Technical Report 06-03.*

Norwich: Centre for Environmental Risk, http://psych.cf.ac.uk/understandingrisk/docs/report_2006.pdf (accessed 18 August 2014).

Bickerstaff, K., P. Simmons and N. Pidgeon. 2008. 'Constructing responsibilities for risk: negotiating citizen-state relationships'. *Environment and Planning A* **40**: 1312-1330.

Boeije, H. 2002. 'A purposeful approach to the constant comparative method in the analysis of qualitative interviews'. *Quality & Quantity* **36**: 391–409.

Boykoff, M. (2011). *2000-2011 UK Newspaper Coverage of Climate Change.* University of Colorado at Boulder: Center for Science and Technology Policy Research.

Boykoff, M. 2007. 'From convergence to contention: United States mass media representations of anthropogenic climate change science'. *Transactions of the Institute of British Geographers* **32**(4): 477-489.

Brechin, S. and M. Bhandari. 2011. 'Perceptions of climate change worldwide'. *Wiley Interdisciplinary Reviews: Climate Change* **2**(6): 871-885.

Brulle, R., J. Carmichael and C. Jenkins. 2012. 'Shifting public opinion on climate change: an empirical assessment of factors influencing concern over climate change in the U.S., 2002–2010'. *Climatic Change* **114**(2): 169-188.

Bulkeley, H., M. Watson and R. Hudson. 2007. 'Modes of governing municipal waste'. *Environment and Planning A* **39**: 2733-2753.

Butler, C. 2010. 'Morality and climate change: Is leaving your TV on standby a risky behaviour?' *Environmental Values* **19**(2): 169-192.

Butler, C. and N. Pidgeon. 2011. 'From 'flood defence' to 'flood risk management': exploring governance, responsibility and blame'. *Environment and Planning: C* **29**(3): 533-547.

Butler, C. and N. Pidgeon. 2009. 'Media communications and public understanding of climate change: Reporting scientific consensus on anthropogenic warming'. In T. Boyce and J. Lewis (Eds.), *Climate Change and the Media*. Oxford: Peter Lang.

Buttny, R. 1993. *Social Accountability in Communication*. London: Sage.

Capstick, S., L. Whitmarsh, W. Poortinga, N. Pidgeon, and P. Upham. 2014. International trends in public perceptions of climate change over the past quarter century. *Wiley Interdisciplinary Reviews: Climate Change*. Article in press.

Carvalho, A. and J. Burgess. 2005. 'Cultural circuits of climate change in U.K. broadsheet newspapers, 1985-2003'. *Risk Analysis* **25**(6): 1457-1469.

Charmaz, K. 2006. *Constructing grounded theory: a practical guide through qualitative analysis*. London: Sage.

Coltart, C. and K. Henwood. 2012. 'On paternal subjectivity: A qualitative longitudinal and psychosocial case analysis of men's classed positions and transitions to first-time fatherhood'. *Qualitative Research* **12**(1): 35-52.

Corner, A. 2011. 'Climate change drops off 'hot topic' list'. *New Scientist*, 15th December.

Corner, A., E. Markowitz and N. Pidgeon. 2014. 'Public engagement with climate change: the role of human values'. *Wiley Interdisciplinary Reviews: Climate Change* **5**(3): 411-422.

Darier, E., C. Gough, B. De Marchi, S. Funtowicz, R. Grove-White et al. 1999a. 'Between democracy and expertise? Citizens' participation and environmental integrated assessment in Venice (Italy) and St. Helens (UK)'. *Journal of Environmental Policy & Planning* **1**(2): 103-120.

Darier, E., S. Shackley and B. Wynne. 1999b. 'Towards a 'folk integrated assessment' of climate change?' *International Journal of Environment and Pollution* **11**: 351–372.

Davidson, M. 2008. 'Wrongful harm to future generations: The case of climate change'. *Environmental Values* **17**: 471-488.

De Young, R. 2011. 'Slow wins: patience, perseverance and behavior change'. *Carbon Management* **2**(6): 607-611.

Defra (2010). *Municipal waste management statistics for England 2009/2010.* London: Department for Environment, Food and Rural Affairs.

Dickinson, J., D. Robbins and L. Lumsdon. 2010. 'Holiday travel discourses and climate change'. *Journal of Transport Geography* **18**: 482-489.

Dryzek, J. 1997. *The Politics of the Earth: Environmental Discourses*. Oxford: Oxford University Press.

Gram-Hanssen, K. 2011. 'Understanding change and continuity in residential energy consumption'. *Journal of Consumer Culture* **11**(1)*:* 61-78.

Hadler, M. & M. Haller. 2011. 'Global activism and nationally driven recycling: The influence of world society and national contexts on public and private environmental behaviour'. *International Sociology* **26**(3): 315-345.

Haidt, J. 2007. 'The New Synthesis in Moral Psychology'. *Science* **316**: 998-1002.

Halkier, B., T. Katz-Gerro and L. Martens. 2011. 'Applying practice theory to the study of consumption: Theoretical and methodological considerations'. *Journal of Consumer Culture* **11**(1): 3-13.

Haque, M. 2000. 'Environmental discourse and sustainable development: linkages and limitations'. *Ethics and the Environment* **5**(1): 3-21.

Heaton, J. 2000. 'Secondary analysis of qualitative data: a review of the literature'. Research report ESRC 1752. Social Policy Research Unit: University of York.

Henwood, K., B. Neale and J. Holland. 2012. 'Advancing methods and resources for qualitative longitudinal research: The Timescapes initiative'. Special Issue of *Qualitative Research* **12**(1).

Henwood, K. and F. Shirani. 2012. 'Researching the temporal'. In Cooper, H. (Ed.), *Handbook of Research Methods in Psychology*. Washington: American Psychological Association.

Henwood, K., F. Shirani and C. Coltart. 2010. 'Fathers and financial risk-taking during the economic downturn: Insights from a QLL study of men's identities-in-the-making'. *21st Century Society* **5**(2): 137-147.

Henwood, K. and I. Lang. 2005. 'Qualitative Social Science in the UK: A Reflexive Commentary on the "State of the Art"'. *Forum Qualitative Social Research* **6**(3): Art. 48.

Henwood, K. and N. Pidgeon. 1992. 'Qualitative research and psychological theorizing'. *British Journal of Psychology* **83**: 97-111.

Hobson, K. 2004. 'Sustainable consumption in the United Kingdom: The "responsible" consumer and government at "arm's length"'. *The Journal of Environment & Development* **13**(2): 121-139.

Höppner, C. and L. Whitmarsh. 2011. 'Public engagement in climate action: policy and public expectations'. In: Whitmarsh, L., S. O'Neill and I. Lorenzoni (Eds.), *Engaging the Public with Climate Change: Communication and Behaviour Change*. Earthscan, London.

Howell, R. 2013. 'It's not (just) "the environment, stupid!" Values, motivations, and routes to engagement of people adopting lower-carbon lifestyles'. *Global Environmental Change* **23**(1): 281-290.

Hulme, M. 2008. 'The conquering of climate: discourses of fear and their dissolution'. *The Geographical Journal* **174**(1): 5-16.

Inglehart, R. 2008. 'Changing values among western publics from 1970 to 2006'. *West European Politics* **31**: 130-146.

Inglehart, R. and W. Baker. 2000. 'Modernization, cultural change and the persistence of traditional values'. *American Sociological Review* **65**: 19-51.

Inthorn, S. and M. Reder. 2011. 'Discourses of environmental citizenship: How television teaches us to be green'. *International Journal of Media and Cultural Politics* **7**(1): 37-54.

Karlsson, R. 2012. 'Individual guilt or collective progressive action? Challenging the strategic potential of environmental citizenship theory'. *Environmental Values* **21**: 459-474.

Kempton, W. 1991. 'Lay perspectives on global climate change'. *Global Environmental Change* **1**(3): 183-208.

Klinsky, S. and H. Dowlatabadi. 2009. 'Conceptualizations of justice in climate policy'. *Climate Policy* **9**: 88-108.

Klinsky, S., H. Dowlatabadi and T. McDaniels. 2012. 'Comparing public rationales for justice trade-offs in mitigation and adaptation climate policy dilemmas'. *Global Environmental Change* **22**: 862-876.

Krosnick, J. 2010. *The Climate Majority*. Op-ed in the New York Times, June 2010, http://www.nytimes.com/2010/06/09/opinion/09krosnick.html (accessed 18 August 2014).

Kurz, T., N. Donaghue,M. Rapley and I. Walker. 2005. 'The ways that people talk about natural resources: discursive strategies as barriers to environmentally sustainable practices'. *British Journal of Social Psychology* **44**: 603-620.

Leiserowitz, A., E. Maibach, C. Roser-Renouf, N. Smith and E. Dawson. 2013. 'Climategate, public opinion, and the loss of trust'. *American Behavioral Scientist* **57**(6): 818-837.

Li, J., M. Wang and Y. Ho. 2011a. 'Trends in research on global climate change: A science citation index expanded-based analysis'. *Global and Planetary Change* **77**(1): 13-20.

Li, Y., E. Johnson and L. Zaval. 2011b. 'Local warming daily temperature change influences belief in global warming'. *Psychological Science* **22**(4): 454-459.

Lorenzoni, I. 2003. *Present choices, future climates: a cross-cultural study of perceptions in Italy and in the UK*. School of Environmental Sciences, University of East Anglia, UK: Unpublished doctoral thesis.

Lorenzoni, I. and M. Hulme. 2009. 'Believing is seeing: laypeople's views of future socio-economic and climate change in England and in Italy'. *Public Understanding of Science* **18**: 383-400.

Lorenzoni, I. and N. Pidgeon. 2006. Public views on climate change: European and USA perspectives. *Climatic Change* **77**: 73-95.

McCright, A. and R. Dunlap. 2011. 'The politicization of climate change and polarization in the American public's views of global warming, 2001-2010'. *The Sociological Quarterly* **52**: 155-194.

Maniates, M. 2001. 'Individualization: Plant a tree, buy a bike, save the world?' *Global Environmental Politics* **1**(3): 31-52.

Markowitz, E. and A. Shariff. 2012. 'Climate change and moral judgement'. *Nature Climate Change* **2**: 243-247.

Medjedovic, I. and A. Witzel. 2005. 'Secondary analysis of interviews: Using codes and theoretical concepts from the primary study'. *Forum Qualitative Social Research* **6**(1): Art.46.

Miles, M. and A. Huberman. 1994. *Qualitative Data Analysis*. London: Sage.

Moser, S. 2010. 'Communicating climate change: history, challenges, process and future directions'. *WIREs Climate Change* **1**: 31-53.

Myers, G. 2007. 'Commonplaces in risk talk: Face threats and forms of interaction'. *Journal of Risk Research* **10**(3): 285-305.

Nordhaus, T. and M. Shellenberger. 2009. 'Apocalypse fatigue: Losing the public on climate change'. *Yale Environment* **360**: 16.

Okrent, D. and N. Pidgeon. 2000. 'Introduction: Dilemmas in intergenerational versus intragenerational equity and risk policy'. *Risk Analysis* **20**(6): 759-762.

Ottenberg, S. 1990. 'Thirty years of fieldnotes: changing relationships to the text'. In Sanjek, R. (Ed.), *Fieldnotes: The Making of Anthropology*. Thaca, NY: Cornell University Press.

Page, E. 2006. *Climate change, justice and future generations*. Cheltenham: Edward Elgar.

Pidgeon, N. 2012a. 'Public understanding of, and attitudes to, climate change: UK and international perspectives and policy'. *Climate Policy* **12**(S1): S85-S106.

Pidgeon, N. 2012b. 'Climate change risk perception and communication: Addressing a critical moment?' *Risk Analysis* **32**(6): 951-956.

Pidgeon, N. and C. Butler. 2009. 'Risk analysis and climate change'. *Environmental Politics* **18**(5): 670-688.

Poortinga, W., A. Spence, L. Whitmarsh, S. Capstick and N. Pidgeon. 2011. 'Uncertain climate: An investigation of public scepticism about anthropogenic climate change'. *Global Environmental Change* **21**(3): 1015-1024.

Raterman, T. 2012. 'Bearing the weight of the world: On the extent of an individual's environmental responsibility'. *Environmental Values* **21**: 417-436.

Rettie, R., K. Burchell and D. Riley. 2012. 'Normalising green behaviours: A new approach to sustainability marketing'. *Journal of Marketing Management* **28**(3-4): 420-444.

Schegloff, E. 1992. 'In Another Context'. In A. Duranti and C. Goodwin (Eds.), *Rethinking Context*. Cambridge: Cambridge University Press.

Scruggs, L. and S. Benegal. 2012. 'Declining public concern about climate change: Can we blame the great recession?' *Global Environmental Change* **22**(2): 505–515.

Segnit, N. and G. Ereaut. 2008. *Warm Words II: How the climate story is evolving and the lessons we can learn for encouraging public action.* London: Institute for Public Policy Research.

Shirani, F., C. Butler, K. Henwood, K. Parkhill, and N. Pidgeon. 2013. 'Disconnected futures: Exploring notions of ethical responsibility in energy practices'. *Local Environment* **18**(4): 455-468.

Shirani, F. and K. Henwood. 2011. Taking one day at a time: Temporal experiences in the context of unexpected life course transitions. *Time and Society* **20**(1): 49-68.

Shove, E. 2010. 'Beyond the ABC: climate change policy and theories of social change'. *Environment and Planning A* **42**: 1273-1285.

Smith, N. and H. Joffe, H. 2013. 'How the public engages with global warming: A social representations approach'. *Public Understanding of Science* **22**(1): 16-32.

Smith, N. and A. Leiserowitz. 2012. 'The rise of global warming skepticism: Exploring affective image associations in the United States over time'. *Risk Analysis* **32**(6): 1021-1032.

Spence, A., W. Poortinga, and N. Pidgeon. 2012. 'The psychological distance of climate change'. *Risk Analysis* **32**(6): 957-972.

Spence, A. and N. Pidgeon. 2009. 'Psychology, climate change and sustainable behaviour'. *Environment: Science and Policy for Sustainable Development* **51**(6): 8-18.

Van Dijk, T. 1997. 'Discourse as Structure and Process'. London: Sage.

Warde, A. 2005. 'Consumption and theories of practice'. *Journal of consumer culture* **5**(2): 131-153.

Weber, E. and P. Stern. 2011. 'Public understanding of climate change in the United States'. *American Psychologist* **66**(4): 315-328.

Weber, E. 2010. 'What shapes perceptions of climate change?' *WIREs Climate Change* **1**: 332-342.

Wells, V., C. Ponting and K. Peattie. 2011. 'Behaviour and climate change: Consumer perceptions of responsibility'. *Journal of Marketing Management* **27**(7-8): 808-833.

Wetherell, M. 2002. 'Debates in discourse research'. In M. Wetherell, S. Taylor and S. Yates (Eds.), *Discourse Theory and Practice*. London: Sage.

Whitmarsh, L. 2008. 'Are flood victims more concerned about climate change than other people? The role of direct experience in risk perception and behavioural response'. *Journal of Risk Research* **11**(3): 351-374.

Whitmarsh, L. 2009. 'What's in a name? Commonalities and differences in public understanding of 'climate change' and 'global warming''. *Public Understanding of Science* **18**: 401–420.

Whitmarsh, L. 2011. 'Scepticism and uncertainty about climate change: Dimensions, determinants and change over time'. *Global Environmental Change* **21**: 690–700.

Wolf, J. and S. Moser. 2011. 'Individual understandings, perceptions, and engagement with climate change: Insights from in-depth studies across the world'. *Wiley Interdisciplinary Reviews: Climate Change* **2**(4): 547-569.

Zaccai, E. 2012. 'Over two decades in pursuit of sustainable development: Influence, transformations, limits'. *Environmental Development* **1**(1): 79-90.

Table 1 Overview of datasets used in the qualitative longitudinal analysis

Dataset year	Study overview	No. participants (no. groups)	Sampling strategy and data collection	Principal researcher; illustrative publications
1997/8	EU-wide project into public understanding of climate change and wider environmental issues (GB data only utilised in present study)	14 (4)	Participants recruited to be demographically diverse; 'participatory dialogue' enabled between public and experts/stakeholders on environmental topics including climate change	Eric Darier; Darier et al. (1999a,b)
2000	Doctoral research into cross-cultural perceptions of climate change	19 (4)	Participants recruited via postal survey; 'discussion groups' convened based on attitudes to climate change (e.g. 'denying' and 'engaging' individuals)	Irene Lorenzoni; Lorenzoni (2003), Lorenzoni and Hulme (2009)
2002	UK project examining risk perceptions of technology and environment, including of climate change	24 (3)	Participants recruited by market research company; focus groups discussed climate change and related 'risks'	Nick Pidgeon; Bickerstaff et al. (2008)
2003	Doctoral research into UK climate change perceptions	20	Opportunity/snowball sampling; participants interviewed individually or in pairs on attitudes to climate change	Lorraine Whitmarsh; Whitmarsh (2008, 2009)
2007	UK project examining perceptions of climate change and energy issues	84 (9)	Participants recruited by market research company; focus groups organised by gender (as well as mixed gender groups) to discuss climate change	Nick Pidgeon; Butler and Pidgeon (2009); Butler (2010)
2010	Doctoral research into longitudinal component of climate change perceptions	47 (5)	Participants recruited by market research company; focus group structure designed to be	[Author name removed for blind review]

	comparable to earlier studies

Table 2 Research themes and open-ended questions used in data collection

Study theme	Example protocol question or moderator question from transcript
General knowledge; initial thoughts about climate change	What sort of images or thoughts come to mind when you think about climate change? (2000) Are there any thoughts about global warming or climate change that spring to mind? (2002)
Causes and consequences of climate change	Why do you think climate change is happening? (1997) Do you personally think the climate is changing and if so, are human actions responsible? (2007) How do you think climate change might affect the world you live in? (2000) In terms of the impacts of climate change, what do you think is likely to happen? (2003)
Concern about climate change; perceived severity	How important or non-important is climate change to you? (1997) Would you say that climate change is something that concerns you? (2003)
Locus of responsibility for addressing climate change	Whose responsibility is it to do something, if anything, about climate change? (2000) Is it an individual's responsibility to do their bit or is it up to governments, is it up to industry, or who? (2002)
Means of responding to climate change (behavioural and policy)	What do you think should be done about climate change? (1997) What do you think should be done to tackle climate change? (2007)

Figure 1 Summary of change and continuity in discourses over time