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Citation for final published version:

Whitmarsh, Lorraine and Corner, Adam 2017. Tools for a new climate conversation: A mixed-methods study of language for public engagement across the political spectrum. *Global Environmental Change* 42 , pp. 122-135.
10.1016/j.gloenvcha.2016.12.008

Publishers page: <http://dx.doi.org/10.1016/j.gloenvcha.2016.12.008>

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Tools for a new climate conversation: A mixed-methods study of language for public engagement across the political spectrum

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This is a pre-copy-editing, author-produced PDF of an article accepted for publication in *Global Environmental Change: Human and Policy Dimensions*, following peer review. The definitive publisher-authenticated version is available online at:

<http://dx.doi.org/10.1016/j.gloenvcha.2016.12.008>

Please cite the paper as:

Whitmarsh, L. & Corner, A. (2017). Tools for a new climate conversation: A mixed-methods study of language for public engagement across the political spectrum. *Global Environmental Change*, 42, 122–135.

Keywords

Climate change attitudes, political orientation, ideology, narratives, communication, scepticism

Acknowledgements

We are grateful to our participants for their time; and for feedback on our initial findings from members of the Understanding Risk research group, Cardiff University. Thanks also to Dan Thorman and to three anonymous reviewers for their comments on an earlier version of this paper. A more detailed analysis of the findings described in Study 1 can be found in a separate (non-peer reviewed) publication (Corner et al, 2016) that is available from <http://climateoutreach.org/resources/centre-right-renewable-energy/>. We acknowledge the support of the European Climate Foundation for Study 1; and the European Research Council (ERC; CASPI project, no. 336665) for the lead author's time.

Highlights

- Mixed-methods paper tests climate change narratives to engage centre-right citizens
- Waste and Great British Energy narratives elicited broad agreement amongst voters
- Justice narrative polarised audiences along political lines
- These narratives can initiate dialogue with traditionally disengaged audiences

Tools for a new climate conversation: A mixed-methods study of language for public engagement across the political spectrum

Abstract

Political orientation and ideology are amongst the most significant influences on climate change attitudes and responses. Specifically, those with right-of-centre political views are typically less concerned and more sceptical about climate change. A significant challenge remains to move beyond this ideological impasse and achieve a more open and constructive debate across the political spectrum. This paper reports on novel mixed-methods research in the UK to develop and test a series of ‘narratives’ to better engage citizens with centre-right political views. Qualitative work in Study 1 revealed two particularly promising narratives. The first focused on the idea that saving energy is predicated on the ‘conservative’ principle of avoiding waste; the second focused on the advantages of ‘Great British Energy’ (based on patriotic support for domestic low-carbon technologies). An online experiment in Study 2 with a representative UK sample compared these narratives with a more typically left-of-centre narrative focused on the concept of ‘climate justice’ with a representative sample of the UK public. Results indicate that the first two narratives elicited broad agreement and reduced scepticism amongst centre-right participants, while the ‘climate justice’ narrative (which reflects a common environmental message framing) polarised audiences along political lines. This research offers clear implications for how climate change communicators can move beyond preaching to the converted and initiate constructive dialogue about climate change with traditionally disengaged audiences.

1 Introduction

It is now well-established that political orientation and ideology are amongst the most significant influences on public engagement with climate change (e.g., Hornsey et al., 2016; Clayton et al., 2015; McCright & Dunlap, 2011). Those with right-of-centre political views are typically less concerned, more sceptical, and correspondingly less receptive to messages about climate change (Leiserowitz et al., 2015; Whitmarsh, 2011; Leviston & Walker, 2011). But while multiple studies attest to the ideological impasse that defines climate change communication in many Anglophone nations, far fewer have been able to offer evidence on how to promote engagement among citizens with right-of-centre political views, or indeed how to design communication and engagement programmes that resonate across the political spectrum.

This question is of significant practical importance. Major goals of the international policy community (such as legally binding national legislation to limit future carbon dioxide emissions in the wake of the Paris United Nations accord; UNFCCC, 2015) are unlikely to be achieved without support from across the political spectrum. In the current paper, we describe two studies with members of the UK public that explore in greater depth the relationship between political conservatism and engagement with climate change. We focus on how different narratives about energy and climate change are perceived by members of the public, whether there are ways of framing climate change that are more engaging for citizens with centre-right political views, and ultimately whether it is possible to use these frames to initiate conversations about climate change which are engaging across the political spectrum (Corner, 2013).

This represents a novel contribution to the literature on climate change communication and framing by focussing on the UK context, which has taken a leading role in international negotiations and has world-leading domestic policy on climate change. Indeed, the UK was the first country to implement a climate change policy, committing it to binding carbon emissions targets (HM Government, 2008), which have recently been reaffirmed in the Fifth Carbon Budget. However, the levels of political and public polarisation over the reality of and responses to climate change are higher than in most other countries besides the US (Painter & Ashe, 2012; Capstick et al., 2014), and yet there has been far less work conducted in the UK context relative to other sceptical Anglophone nations. We therefore test the conclusions of previous (mostly US-centric) work on framing in a novel cultural context, and seek to develop new insights that could be applied in other settings characterised by political polarisation – at a time when the UK is facing enormous constitutional change and upheaval as it prepares to leave the European Union.

Second, the research is novel in its approach – devising new narratives through qualitative discussions with key audiences and testing these through a representative experimental survey in order to explore both differences and commonalities across responses in both methodological approaches. Many studies develop experimental materials based on a priori (e.g., theoretical) assumptions about what language and concepts are appropriate, whereas the current study used a primarily bottom-up approach, developing materials by engaging directly with the target audience. Finally, its novelty lies in the materials tested, particularly the narrative exploring the notion of avoiding waste as a rationale for conserving energy, which has not to our knowledge previously been examined despite the acknowledged importance of frugality as a principle underlying sustainable lifestyles (Evans & Abrahamse, 2008).

1.1 Values, worldviews, ideology & scepticism about climate change

Public views about climate change have been subject to extensive empirical and theoretical research, and although a range of factors are now understood to influence public engagement, the role of values (Schwartz, 1992), worldviews (Douglas, & Wildavsky, 1982) and, as a consequence, political ideology are among the key predictors of scepticism and engagement (Corner et al., 2014; Hornsey et al., 2016). A value is usually defined as a guiding principle in the life of a person (Schwartz, 1992), and it is now widely accepted that there are 56 universal values that can be divided into four distinct clusters which vary along two basic axes. Those axes are openness to change (including self-direction and stimulation) versus a desire to conserve/respect tradition (including security and conformity); and self-transcendence (including altruism, forgiveness, and loyalty) versus self-enhancement (including power, ambition and hedonism). Although people possess a range of different and partly conflicting values, those who identify strongly with self-enhancing values (e.g. materialism, personal ambition) tend not to identify strongly with self-transcending values (e.g. benevolence, respect for the environment), and vice-versa (Crompton, 2010). With regards to public engagement with environmental issues and climate change, there is clear evidence from this research: people who lean more strongly towards self-transcending values, especially altruism, show higher concern about environmental issues, are less likely to be sceptical about climate change, and are more likely to support environmental policies and engage in sustainable behaviours such as recycling and energy consumption (Brown & Kasser 2005; Corner et al., 2014; de Groot & Steg 2009; Poortinga et al. 2004).

An analogous conception can be found in the cultural theory of risk (Douglas & Wildavsky, 1982). According to this approach, people's orientations towards different societal arrangements are impacted by 'cultural worldviews' that also vary along two axes. The first axis, 'hierarchy-

egalitarianism’, refers to a cultural preference for an equitable division of resources (i.e. irrespective of gender, race or religion). The second axis, ‘individualism-communitarianism’, relates to the question of whether individual interests should be subordinated to collective ones. Individuals with stronger egalitarian and communitarian worldviews tend to perceive climate change as riskier than those with individualistic and hierarchical views (Stern et al., 1993). Egalitarian-communitarians also perceive a more urgent need for ameliorative action and are typically more supportive of climate policies that restrain market freedom (e.g., regulation of industry). In contrast, individualistic and hierarchical individuals tend to be more supportive of climate policies that maintain the autonomy of the free market (e.g., enhanced nuclear power capacity or geoengineering; Dietz et al., 2005). In other words, those who strongly support free markets and the primacy of private ownership but oppose governmental influence on the everyday behaviour of individuals are more likely to be sceptical about climate change (McCright & Dunlap, 2011) and the urgent need for its mitigation (Zia & Todd, 2010).

Both values and cultural worldviews are determinants of an individual’s political ideology, whether expressed through party affiliation or their general political preferences (Goren, 2005). However, when dealing with subjects as complex and contested as political ideology, it is difficult to draw simple conclusions. Political conservatism means different things in different countries and cultures, as does the idea of a political spectrum from ‘left’ to ‘right’ (Aspelund et al., 2013). Nonetheless, right-leaning individuals have been shown to be more likely to endorse self-enhancing values (Sheldon & Nichols, 2009) and to express worldviews that lean towards individualistic and hierarchical perspectives (Kahan et al., 2012). Correspondingly, political conservatism predicts scepticism about climate change, particularly but not exclusively in English-speaking countries (McCright & Dunlap, 2011).

Formalising the reasoning implicit in many of the studies reviewed above, Campbell and Kay (2014) described the phenomenon of ‘solution aversion’ among US conservatives, arguing that Republicans’ scepticism towards scientific knowledge about climate change and the environment is actually explained by a conflict between their ideological values and the most popular solutions to environmental problems (rather than the scientific evidence itself). They found climate solutions involving government regulation to be especially unpopular among conservative participants. In the UK, there is a direct relationship between voting for the Conservative Party and scepticism about climate change, suggesting that conservative values seem to be at least as important as environmental values in driving scepticism about climate change (Whitmarsh, 2011). As in the US, the usual

explanation advanced for this relationship is that there is a conflict between conservative values – in particular around free market paradigms and individualism – and policies to tackle climate change (Campbell & Kay, 2014). But is it really the case that the values of the centre-right and engagement with climate change are inherently incompatible, or is it due to how solutions have to date tended to be framed?

1.2 Framing climate change to engage centre-right citizens

The convergent evidence reviewed above suggests that certain elements of right-of-centre belief systems are not a natural fit with the dominant social and cultural understanding of what climate change means (Hulme, 2009), and climate and energy policies typically promoted in response to it (Campbell & Kay, 2014). For example, one common way in which climate change is framed is as a question of social justice, given the disproportionate impacts on poorer countries and communities while wealthier countries and individuals are responsible for emitting more carbon (Hulme, 2009). However, as Wolsko et al (2016) argue in a recent analysis of US conservatives' responses to differently-framed messages about the environment, *“it may not be concern about the environment which is primarily being rejected by conservatives, but rather the moral tone of the prevailing environmental discourse, in which practising “environmentalism” signifies being unfaithful to one's in-group and associated conservative values”* (Wolsko et al, 2016). In this section, we briefly review the limited evidence offering a constructive response to the challenge posed by the disconnect between right-of-centre values and the discourse on climate change.

Firstly, there is some evidence that climate messaging focused on the 'co-benefits' of climate policies is an effective way of reaching more sceptical citizens. Bain et al. (2012) showed that among an audience of climate change 'deniers', messages that focused on the economic and technological development that climate policies would bring, were most effective. Myers et al's (2012) comparison of differently-framed messages about climate change action found focussing on public health benefits elicited the most positive responses, suggesting shifting the terms of the debate from 'concern about climate change' to 'concern about public health' is likely to appeal to audiences irrespective of political ideology (Maibach et al, 2010). One UK study (Mocker, 2012) showed research participants drawn from a sample of Conservative (i.e., centre-right) voters two versions of a video where an actor gave a speech on low-carbon transport. Both videos discussed transport problems and the need for electrification and increased use of public transport, cycling, and walking. While one version of the video framed these issues around economic concerns, the other discussed the issues in the context of the dangers and benefits for community health. The video, which placed an emphasis on community health, prompted a greater feeling of empowerment and personal

motivation to act on climate change, relative to the video with an economic focus. Other work has suggested that framing a pro-environmental message as patriotic, by suggesting that environmental conservation can protect the ‘American way of life’, or as ‘morally pure’, whereby environmental harm is positioned as a violation of the sanctity of nature, are effective ways of reaching the US right on climate change (Feygina et al, 2010; Feinberg & Willer, 2013; cf. Wolsko et al. 2016).

To date, however, little research has explored such framing effects outside of the US. In the UK, it is certainly not the case that all forms of political conservatism are inherently in conflict with environmental concern or engagement with climate change. British conservatism – on the centre-right of the political spectrum – has various shades and strands, including an emphasis on pragmatism (Adams, 2001), the conservation of cultural institutions and national heritage, and a respect for inter-generational duty (Scruton, 2012). Shrubsole (2011) noted several centre-right values that could underpin positive engagement with climate change. One example is a concern for protecting the British countryside and its aesthetic beauty for future generations. The aesthetic appeal of the countryside and the activities and livelihoods it supports are a part of the cultural heritage that conservatism seeks to protect. Another is intergenerational duty, expressed by preserving the environment for future generations. The idea of the ‘Burkean contract’ (Burke, 1910) between those who are living, those who are dead, and those who have not yet been born has been a key part of British centre-right thought for over a century (Green, 2004). Similarly, avoiding waste is consistent with centre-right values of responsibility and pragmatism (Corner, 2013).

The challenge therefore remains to move beyond the ideological impasse on centre-right engagement with climate change and achieve a more open and constructive debate across the political spectrum. It seems clear that there are potential overlaps between centre-right values and positive engagement with climate change, but this paper is the first direct evidence of how UK citizens with centre-right views respond to differently framed ‘narratives’ about climate change. In this paper, we particularly focus on ‘centre-right’ ideology in order that the narratives are developed with and for a particular target audience. Nevertheless, we recognise that political ideology is complex and can be conceptualised in many different ways, so explore responses across the ‘left-right’ spectrum (including the far right) and using different ideological indicators (e.g., voting behaviour, cultural cognition, Kahan et al., 2012) to provide a broad-based and complementary analytical framework for exploring our research questions.

There is no single, universal definition of a ‘narrative’, but the term has become increasingly common among climate change communication researchers and practitioners (Smith et al., 2014; Fløttum & Gjerstad, 2016). Narratives (or stories) are a fundamental tool used by humans to make sense of the world and their place within it; they help reduce complexity and provide meaning and are applied at every level of society (from institutional discourses to everyday accounts; e.g., Abell, 1987). Consequently, their importance as a communication tool is endorsed by scholars from across disciplines as diverse as linguistics, psychology and literary theory (e.g., Herman, 2013). In contrast to studies of message-framing that typically change a small number of words between different experimental treatments (offering close control but arguably less ecological validity), this paper explores narratives as clusters of ideas and concepts derived from the identified audience (rather than as a fixed format for ‘delivering’ a message). We apply here the definition of a narrative as a storyline or narrated text that ‘defines problems, indicates causes and possible solutions as well as moral responsibilities’ (Fløttum & Gjerstad, 2016, p.2). Consistent with informal modes of story-telling, we also use the first person as narrator. As such, we position narratives here as a particular *type of framing* that is holistic (in that our materials are designed to capture several complementary concepts), personal (in that they use a voice that speaks directly to participants) and action-oriented (in that we focus on solutions and spell out policy implications).

In the following sections, we report on mixed-methods research to develop and test a series of narratives to engage UK citizens with centre-right political views. Study 1 (Section 2) was an in-depth qualitative investigation, involving a series of structured discussion groups with UK centre-right voters, to identify and trial narratives focusing on different framings of energy and climate change designed to resonate with centre-right political values. Study 2 (Section 3) involved an online experiment with a nationally representative UK sample to provide a large-scale empirical test of two particularly promising narratives, and a comparison traditional ‘green’ narrative (hypothesised to appeal only to left-of-centre voters). The paper concludes with implications for communication and public engagement with climate change (Section 4).

2 Study 1: Developing the narratives

2.1 Materials & Methods

Four discussion groups with members of the UK public were conducted in September 2015, using the ‘narrative workshop’ method, a format for holding structured discussions used successfully in multiple climate change public engagement projects (Corner & Roberts, 2014;

Marshall, 2014). In line with this methodology, the first half of each discussion followed a ‘funnel’ design from an open, general conversation about participants’ values and views on social issues, through more focused conversation about energy and climate change, and into a discussion of climate change and political conservatism specifically. The second half of each workshop was dedicated to the exploration and discussion of a set of four narratives, designed specifically for the project. The narratives (see Appendix 1 for full text) were short pieces of written text that used different language to describe climate change, and policies that could be employed to address it, designed to speak to different centre-right values and concerns. Four narratives were tested: firstly, the idea that ‘avoiding waste is common sense’ (as a justification for conserving energy); secondly, the notion of promoting good health and quality of life (as a co-benefit of more sustainable living); thirdly, a patriotic call for a ‘Great British Energy’ system; and fourthly, the notion of ‘the smart money’ being in renewables and clean energy technologies. We term these four frames ‘Waste’, ‘The Good Life’, ‘Great British Energy’ and ‘The Smart Money’ from this point onwards. .

Recruitment took place using a snowball method through relevant networks associated with Conservative Party local constituency offices in two rural (Barcombe and Leominster), and two urban (Richmond and Bradford) locations. This provided a ‘convenience’ sample of the population we sought to make inferences about (i.e. those with centre-right political views). In total, 45 people participated in the research, in groups of between nine and 13 people. Six in ten participants were male; 65% were 55 or older, 22% aged between 25-54 and 13% were 18-24 years old. In terms of ethnicity, 30 of the participants identified as white, five as Asian and one as black; nine did not provide this information. Socio-economic backgrounds were mixed; several participants were elected local councillors or held other local positions of political office in the Conservative Party. Participants were paid for their participation. The workshops were audio-recorded and transcribed, with analysis proceeding in a two-step process. Firstly, each workshop was analysed individually, with particular attention paid to instances of strong reactions (positive or negative) to climate change, the tested materials, as well as the values explored in the first part of the discussions. Next, a synthesis across all workshops was conducted, to establish conclusions that could be drawn from across the full set of workshops (while noting areas of potential diversion – e.g. across the rural/urban divide).

2.2 Results

The four groups generated a large amount of rich data, including evidence of how centre-right views and values related to attitudes towards climate change and possible responses to it. These

data are analysed in greater detail elsewhere (Corner et al, 2016); here, we focus exclusively on the second half of the workshops, where the four narratives were explored and evaluated.

2.2.1 – Narrative 1: Waste

This was consistently the most popular narrative. It was perceived as reflecting several core centre-right values - pragmatism, responsibility and common sense - and the idea that it is irresponsible to waste things (from food, to resources, to energy) resonated strongly with participants. In part, the strength of this narrative derived from the fact that, unprompted, several participants (in different groups) had used very similar language themselves in describing their views earlier in the discussion groups. Of all the narratives, it seemed to provide the closest fit with a centre-right worldview, and even among participants sceptical about climate change, the logic of avoiding waste was not rejected:

“There’s not much there I would argue about. I’m of a certain generation. My mother’s generation wouldn’t waste anything and I wouldn’t want to see things wasted” (Male, Barcombe)

It also seemed to transcend the sense of ‘political correctness’ that plagues the issue of climate change for many on the right of the political spectrum:

“Beyond this [climate change] is the real principle at stake here about how flagrantly we are using the Earth’s resources in this appalling way and not considering future generations... allowing them to inherit these problems...we don’t need to use as much as we do” (Female, Barcombe)

While the narrative was generally well-received, certain elements were challenged. For example, participants in Bradford felt that reference to avoiding littering would not work well in inner city neighbourhoods where fly-tipping is a constant problem; while many refuted the claim that progress is being made with recycling and excess packaging.

2.2.2 Narrative 2: The Good Life

This narrative received a mixed response. On the one hand, the central idea of linking leaky homes and ‘dirty’ forms of fossil fuel energy to worse health outcomes attracted mostly positive reactions:

“As a care manager I’ve been into plenty of homes where especially the elderly who own their own homes haven’t had the money to do them up and keep them up and don’t have any heating and it is one of the main factors to why they’re dying” (Female, Leominster)

There was some acknowledgment that bringing climate change closer to people's everyday lives through issues such as 'the air we breathe' was a viable strategy for making it more understandable: *"Being able to link climate change immediately with your life is quite key"* (Male, Richmond)

However, especially among some of the older participants, there was doubt that air pollution was still a significant issue, with some remembering first hand the much worse conditions in the first half of the 20th century. And some (older) participants dismissed the idea that the elderly were particularly vulnerable, preferring to see cold houses as a proof of the traditional virtue of hardiness:

"Officially I'm elderly and I live in an old and draughty home and I've worked hard all my life and I'm not miserable" (Male, Leominster)

This provides further evidence that age is an important factor to consider when engaging centre-right audiences, and also speaks to the consistent underlying theme of climate change campaigns lacking credibility and authenticity. Crucially, it also suggests that the concept of 'fuel poverty' is not uncritically accepted among this audience. In two of the four groups this narrative was identified as sounding especially unsuitable for centre-right audiences:

"Talking about people that deserve better is typical left language" (Female, Barcombe)

Another way in which the credibility of this narrative was challenged was doubt over the statistic on excess winter deaths. This was partly because the source of the figures was unacknowledged (and so attributed to climate change campaigners even though the source was the government-funded Office for National Statistics), and partly because of the mention of the British Medical Association (BMA), to which many participants attributed politicised motives. There was also consistent rejection of the idea that social issues (such as vandalism and crime) should be associated with environmental issues and climate change.

2.2.3 Narrative 3: Great British Energy

One key concept in this narrative - that local democracy is (or should be) the backbone of Britain - was strongly supported across all four groups. However, whilst there was broad support for involving local communities more actively in decision-making about energy infrastructure, there was also a sense across the groups that energy policy was something that needed to be driven by national decision-making:

“Well that’s a really powerful argument isn’t it, to say ‘well if you, as a local community, don’t want this form of energy then what do you want? It’s in your hands’” (Female, Richmond)

The contrast drawn in the narrative between living with a wind turbine or a fracking well was roundly rejected as a legitimate choice, with several participants stridently answering that they would prefer to live near a fracking well.

“People need to consider local concerns as there will be opposition to all energy projects. I think shale gas and wind farm concerns are almost one and the same. It’s not the source of energy that is being produced, it’s the disruption and the risks to housing for those local people” (Male, Richmond)

2.2.4 Narrative 4: The Smart Money

This was consistently the least favoured narrative. Most of the groups expressed doubts about the true motivations of big business. While the idea that decarbonising made ‘good business sense’ was positively received, the inclusion of corporations (Ikea, Unilever, M&S) in the narrative was unpopular. These organisations were not seen as particularly trusted messengers and there was a consistent sense that they were primarily motivated by their public reputation and profits (and, on the same principle, that government supported renewables in order to increase its revenue). For some participants the very term ‘smart money’ suggested ‘self-interested fat cats’ and the feeling that ‘I’ll end up paying more for it’.

“These companies will take it seriously up to a point but they are enormously greedy... it’s all to make money” (Female, Leominster)

As we found with the ‘big numbers’ in the health narrative (regarding extra winter deaths from cold homes), the figures in this narrative were repeatedly challenged and doubted, in particular the idea that renewables are now a ‘smart investment’. The figures in fact came from an article by a prominent conservative, Ben Caldecott. However, because the source was not referenced, the figures were automatically assumed to come from an unreliable source such as a solar panel company or a campaigning organisation.

2.3 Discussion

Study 1 represents the first empirical exploration of language and narratives designed specifically to engage UK citizens with centre-right views more effectively on climate change, and some clear patterns emerged. Firstly – and cutting across several of the tested narratives – the notion of authenticity appeared to be at the forefront of participants’ judgments, with doubts raised about the credibility of both sources of information and statistics. This suggests that the dramatic claims

frequently made by campaigners about climate risks, although scientifically justified, may be counterproductive in terms of engaging this audience. Secondly, there were clear preferences for certain narratives (or at least concepts within them), with the idea of avoiding wastefulness and nurturing home-grown energy production both receiving largely positive evaluations from most participants. Thirdly, some concepts that previous literature has suggested ought to be effective in engaging this audience did not fare particularly well. In particular, elements of the narrative focused on the health benefits of energy-saving (The Good Life) were not particularly well-received (cf. Myers et al., 2012), and neither were the claims about the benefits of investing in renewable energy technologies in the ‘Smart Money’ narrative (cf. Bain et al., 2012). In both cases, there were doubts about the credibility of the claims – either because of a distrusted source (e.g., the trade union BMA) or financial figures that were perceived as hyperbolic. It is interesting that discourses that repeatedly emerge in studies of environmental attitudes amongst the general public were evident here, too, within this sub-group; in particular, a sense that natural resources should be protected and that ‘big business’ is untrustworthy (e.g., Wolf & Moser, 2011). This provides further indications that there may be unifying narratives that appeal across the political spectrum.

These findings provide a valuable and indicative sense of the way in which four different narratives about energy and climate change – all potentially congruent with centre-right belief systems – were engaged with by a centre-right audience. However, as with all qualitative work of this nature, it is not possible to make statistically robust extrapolations based on a sample of this size (and indeed with a rather older than average demographic). Study 2 therefore picked up two of the narratives that received a positive reception in Study 1 and explored them further, but using a nationally representative sample in an online experiment.

3 Study 2: Testing the narratives

Study 2 employed a representative UK public sample and compared adapted versions of the Waste and Great British Energy (henceforth ‘British’) narratives with a more typically left-of-centre narrative focused on the concept of ‘climate justice’ (‘Justice’). These two narratives were selected as they received the strongest support in Study 1. While elements of ‘The Good Life’ narrative were well-received, other aspects were not; in addition, while health-framing has been explored in previous studies (e.g., Myers et al., 2012), the concepts in the Waste and British narratives have not. This allowed us not only to test how well the new narratives worked to

engage the centre-right participants within a representative sample, but also to establish their resonance amongst voters from across the political spectrum.

3.1 *Materials & Methods*

3.1.1 *Design*

An online experiment was designed to test the Waste and British narratives, and compare these with the Justice narrative. A fourth control condition presented advice on how to safely change a car tyre ('Control'). The design was between-subjects, with participants randomly assigned to one of the four conditions. All participants provided demographic information and voting intention, read the text, and then completed all dependent variables (DVs) and independent variables (IVs) and covariates.

3.1.2 *Participants*

Participants (N=2,088) were recruited from an online research panel (Qualtrics) in December 2015 using a quota sample¹. The quotas were nationally representative of the UK public in respect of gender, age, and ethnicity (according to census data), as well as voting intention (according to the most recent national election, in 2015). A demographic breakdown is shown in Table 1.

Table 1. Sample characteristics

		%			%	
Country	England	85.7	Voting intention	Would not vote	2.1	
	Wales	4.2		Conservative	37.1	
	Scotland	8.9		Labour	30.6	
	Northern Ireland	1.2		Liberal Democrats	8	
Age	16-24	13		Scottish National Party (SNP)	4.2	
	25-34	16.2		UK Independence Party (UKIP)	12.7	
	35-44	17.1		Green	3.8	
	45-54	17.7		Other / Prefer not to say	1.5	
	55-64	15		Highest qualification	No formal qualifications	5.2
	65+	21			GCSE / O-Level	20.7
Gender	Female	50.6	A-Level / Higher / BTEC		19.9	
	Male	49.3	Vocational / NVQ		14.2	
	Other	0.1	Undergraduate degree		27	
			Postgraduate degree	13		

¹ Although the sample was not a proportional random sample, in order to minimize the risk of bias, the survey company uses a three-stage randomisation process in matching a participant with a survey they are likely to be able to complete. First, participants are randomly selected from the panel to be invited to take a survey, and these participants are combined with others entering another sampling platform after responding to online messaging. A set of profiling questions is randomly selected for them to answer and upon completion, participants are matched with a survey they are likely to be able to take, using a further element of randomisation.

Ethnicity	Black (e.g., Black Caribbean, Black African)	2.6	Rurality	Urban	36.1
	White	90.7		Sub-urban	42.7
	Asian (e.g., Indian, Pakistani, Chinese)	4.5		Rural	21.2
	Mixed (e.g., White & Asian, White & Black)	2			
	Other	0.2			
	Prefer not to answer	0.1			

3.1.3 Materials

Participants in all four conditions were presented with an introduction to the text they were asked to read to increase credibility and ensure elaboration: *“Please read the following recent letter to the Editor of a UK broadsheet newspaper carefully as you will be asked a number of questions about it afterwards.”*

One of the narratives was then presented (full texts in Appendix 2). The ‘Waste’ narrative referred to avoiding waste as *‘common sense’* and those living in drafty homes as *‘throwing energy away’*. The rationale provided for climate change action was *‘avoiding waste, conserving energy, and finding a way of doing more with less’*. The ‘Great British Energy’ narrative stated *‘decisions about energy technologies should be taken by the British people’* and referred to *‘producing our own energy, through British-made solar and wind technologies’*. Climate change action was framed in terms of *‘supporting British manufacturing and technology, and creating more green jobs’*. Finally, the ‘Justice’ narrative stated *‘the poorest people in the world are the ones who will suffer the most from the impacts of climate change, but they’ve done the least to cause it’* and advocated *‘those with more resources do more to tackle climate change’*. All of the experimental texts concluded *‘That’s why I agree that the government should sign up to an international agreement to tackle climate change, and I think the people of Britain have a role to play in making changes to our own lifestyles to reduce our impact on the environment’* followed by a short sentence summarising the underpinning narrative principle.

Finally, the Control condition presented advice on changing a car tyre. The length of the article (159 words) was matched to the experimental conditions, and there were no references made to climate or energy (e.g., *“Given a safe environment, the right tools and some basic knowledge, changing a wheel on any vehicle should be fairly straightforward...”*).

3.1.4 Measures

Following the text, participants were asked, *“Now please spend a couple of minutes thinking about what you’ve just read. What thoughts came to mind when you were reading the letter?”*

(open-ended) to ensure elaboration. A manipulation check then followed which confirmed that participants had read the text (see Appendix 3).

Two DVs related to responses to the article. First, *agreement with the article* was measured with five items, measured on a seven-point scale (7=completely agree to 1=completely disagree) including: 'I do not agree with what the letter was saying' (reverse scored), 'The issues raised in the letter are important to me', 'The letter made a very persuasive argument'. The items formed a reliable scale ($\alpha(5)=.80$). Second, *reactance to the article* was measured with three items drawn from previous identity threat research (e.g., Witte et al., 1998), again measured on a seven-point agreement scale including: 'The problems described in the letter were exaggerated', 'The letter was trying to manipulate my feelings' ($\alpha(3)=.77$).

The remaining six DVs included climate change perceptions and responses:

- *Policy support* focussed on the two policies proposed in the articles: (a) *government action*, and (b) *lifestyle change*; each was measured with on a five-point scale (Strongly support to Strongly oppose): 'Please indicate how much you support or oppose the following... The UK government signing up to an international agreement to tackle climate change' and 'British people making changes to their lifestyles to reduce their impact on the environment'.
- *Climate change concern* was measured with one item (from, e.g., Spence et al., 2011): 'How concerned, if at all, are you about climate change, which is sometimes referred to as 'global warming?' on a four-point scale ('very concerned' to 'not at all concerned') with a 'don't know' option (removed for analysis).
- *Risk perception* was measured with four items on a five-point scale from 'extremely serious' to 'not at all serious' (from Capstick et al., 2015): 'How serious a threat, if at all, is climate change to each of the following? You and your family, The UK as a whole, People in developing countries, Wildlife and ecosystems ($\alpha(4)=.89$).
- *Climate scepticism* was measured with six items (derived from Whitmarsh et al., 2015) on a five-point agreement scale including: 'Claims that human activities are changing the climate are exaggerated', 'There is too much conflicting evidence about climate change to know whether it is actually happening', 'I am convinced that climate change is really happening' (reversed) ($\alpha(6)=.91$).
- *Willingness to act* was measured on a seven-point willingness scale (extremely willing to not at all willing) with six items (from Capstick et al., 2015) intended to reflect both consumer and citizen actions: 'Change to a 'green' energy supplier', 'Cut down the amount you travel by

car’, ‘Buy appliances that are more energy-efficient’, ‘Reduce the amount of energy you use at home’, ‘Write letters, email, or phone your local MP about climate change’, and ‘Sign a petition about climate change, either online or in person’ ($\alpha(6)=.87$).

We included a number of conceptually complementary variables to establish the political orientation of participants. *Political ideology* was measured with the item: ‘In politics people sometimes talk of "left" and "right". Using the scale below, where would you place yourself on the political spectrum?’ measured on an 11-point scale from Left (0) to Right (10). For the purposes of multivariate analysis of variance (MANOVAs), we created three equal-sized groups, which effectively represent: left-wing and centrist (0-5), centre-right (6), and (far) right (7-10). Political ideology was used as an IV, along with experimental condition, in the analysis².

Two covariates – cultural cognition and pro-environmental identity – were included also included as these have been found, along with demographic measures, to predict climate change attitudes and responses in previous research (e.g., Whitmarsh, 2011; Hornsey et al., 2016). First, *cultural cognition* was measured with a six-point agreement scale adapted from Kahan et al. (2011; Lord et al., in prep) and comprising five items in the *Hierarchism* sub-scale ($\alpha(5)=.50$) including: ‘If things keep going the way they are, soon ethnic minorities will have more rights than the majority’, ‘The wife or female partner should have primary responsibility for childcare’. The *Individualism* sub-scale comprised four items ($\alpha(4)=.62$) including: ‘The government tries to control people’s behaviour too much’, ‘The government needs to place certain limits on freedom of speech for the benefit of society as a whole’ (reversed). *Pro-environmental identity* was measured with three items (see Whitmarsh & O’Neill, 2010) on a five-point agreement scale including: ‘Being environmentally-friendly is an important part of who I am’, ‘I think of myself as someone who is very concerned about environmental issues’ ($\alpha(3)=.67$).

3.2 Results

3.2.1 MANOVAs

MANOVAs showed that political ideology had a significant main effect for all DVs (Table 2). Specifically, those with left-wing political ideology showed highest agreement with the

² We also explored the role of voting intention and cultural cognition as IVs, instead of political ideology. The former analysis showed results consistent with the ideology analysis, but categorising political parties into ‘left-right’ was problematic since most political scientists agree that parties differ along multiple dimensions (e.g., Kahan et al., 2012). The Cultural cognition measures used here showed some main effects (again, consistent with the ideology analysis), but no significant interactions. Given the lower reliability of these measures, and the more straightforward operationalization of political ideology, we selected this as IV for the remaining analysis.

experimental articles, climate change concern, risk perception, support for government action and lifestyle change, and willingness to act; and lowest reactance and climate scepticism.

Table 2. MANOVA Tests of Between-Subjects Effects (significant effects are shown in bold)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial η^2
Left-right ideology (3 groups)	Article agreement	51.85	2.00	25.93	15.95	0.00	0.02
	Article reactance	118.30	2.00	59.15	29.15	0.00	0.03
	Climate change concern	63.48	2.00	31.74	25.64	0.00	0.02
	Risk perception	38.74	2.00	19.37	24.92	0.00	0.02
	Climate scepticism	154.90	2.00	77.45	79.46	0.00	0.07
	Support for government action	71.45	2.00	35.72	31.78	0.00	0.03
	Support for lifestyle change	31.11	2.00	15.55	16.01	0.00	0.02
	Willingness to act	126.82	2.00	63.41	36.47	0.00	0.03
Experimental condition	Article agreement	51.86	3.00	17.29	10.64	0.00	0.02
	Article reactance	138.87	3.00	46.29	22.81	0.00	0.03
	Climate change concern	0.72	3.00	0.24	0.19	0.90	0.00
	Risk perception	4.96	3.00	1.65	2.13	0.10	0.00
	Climate scepticism	1.86	3.00	0.62	0.64	0.59	0.00
	Support for government action	2.59	3.00	0.86	0.77	0.51	0.00
	Support for lifestyle change	6.09	3.00	2.03	2.09	0.10	0.00
	Willingness to act	1.19	3.00	0.40	0.23	0.88	0.00
Ideology x condition	Article agreement	79.21	6.00	13.20	8.12	0.00	0.02
	Article reactance	54.26	6.00	9.04	4.46	0.00	0.01
	Climate change concern	7.65	6.00	1.28	1.03	0.40	0.00
	Risk perception	4.44	6.00	0.74	0.95	0.46	0.00
	Climate scepticism	14.93	6.00	2.49	2.55	0.02	0.01
	Support for government action	4.88	6.00	0.81	0.72	0.63	0.00
	Support for lifestyle change	11.29	6.00	1.88	1.94	0.07	0.01
	Willingness to act	7.37	6.00	1.23	0.71	0.65	0.00

Post-hoc analyses (Table 3) using Bonferonni correction showed all ideology groups differed significantly from one another in respect of the DVs, with only two exceptions: left and centre-right did not significantly differ on article reactance; and centre-right and (far) right groups were only marginally significantly different for support for lifestyle change. Effect sizes, however, are small in general, with climate scepticism showing the largest effect (partial $\eta^2 = .07$).

In respect of experimental condition, responses to the articles differed significantly (Table 4). Specifically, Waste (M=4.91, SD=1.30) elicited the highest agreement overall, followed by British (M=4.81, SD=1.33), then Justice (M=4.68, SD=1.40) and Control (M=4.50, SD=1.15). In terms of statistical significance, Waste was significantly preferred to Justice; while Justice was no

more preferred than our Control text (changing a car tyre). Article reactance was significantly higher for all experimental texts – Waste (M=3.77, SD=1.47), British (M=3.82, SD=1.50), and Justice (M=3.88, SD=1.48) – than for the Control text (M=3.21, SD=1.38). In other words, respondents felt all climate change narratives were significantly more exaggerated, strained the truth more, and manipulated their feelings more, than a non-climate change message.

Table 3. Differences between ideology groups on article responses and climate change perceptions/responses (post-hoc analyses)

<i>DV</i>	<i>(I) Ideology</i>	<i>(I) Mean (SD)</i>	<i>(J) Ideology</i>	<i>Mean Difference (I-J)</i>
Article agreement	Left	4.95 (1.32)	Centre-right	.23***
	Centre-right	4.72 (1.23)	(Far) right	-.18*
	(Far) right	4.54 (1.33)	Left	-.41***
Article reactance	Left	3.41 (1.43)	Centre-right	-0.14
	Centre-right	3.55 (1.39)	(Far) right	.43***
	(Far) right	3.98 (1.54)	Left	.57***
Climate change concern	Left	3.14 (.77)	Centre-right	.21***
	Centre-right	2.93 (.79)	(Far) right	-.14***
	(Far) right	2.79 (.88)	Left	-.35***
Risk perception	Left	3.97 (.80)	Centre-right	.18***
	Centre-right	3.79 (.86)	(Far) right	-.18*
	(Far) right	3.61 (.96)	Left	-.35***
Climate scepticism	Left	2.36 (1.01)	Centre-right	-.37***
	Centre-right	2.73 (.95)	(Far) right	.30***
	(Far) right	3.03 (1.01)	Left	.67***
Support for government action	Left	4.26 (.97)	Centre-right	.31***
	Centre-right	3.96 (1.00)	(Far) right	-.16**
	(Far) right	3.80 (1.17)	Left	-.47***
Support for lifestyle change	Left	4.21 (.93)	Centre-right	.20***
	Centre-right	4.01 (.95)	(Far) right	-0.11(*)
	(Far) right	3.90 (1.05)	Left	-.31***
Willingness to act	Left	5.25 (1.29)	Centre-right	.41***
	Centre-right	4.84 (1.27)	(Far) right	-.20**
	(Far) right	4.65 (1.37)	Left	-.61***

(*) p=.08, * p<.05, ** p<.01, ***p<.001

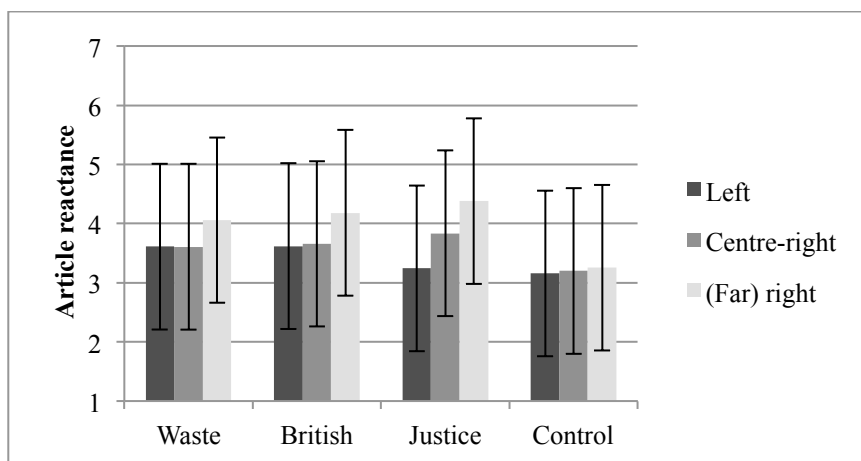
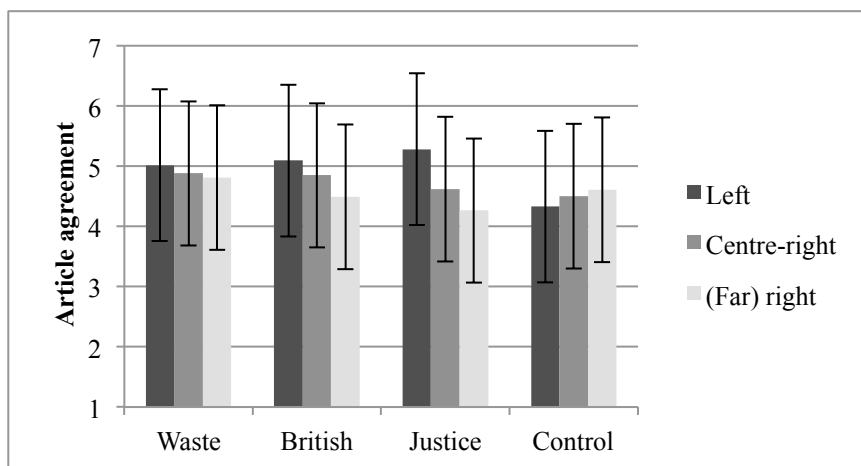
Table 4. Differences between narratives on article responses and climate change perceptions/responses (post-hoc analyses)

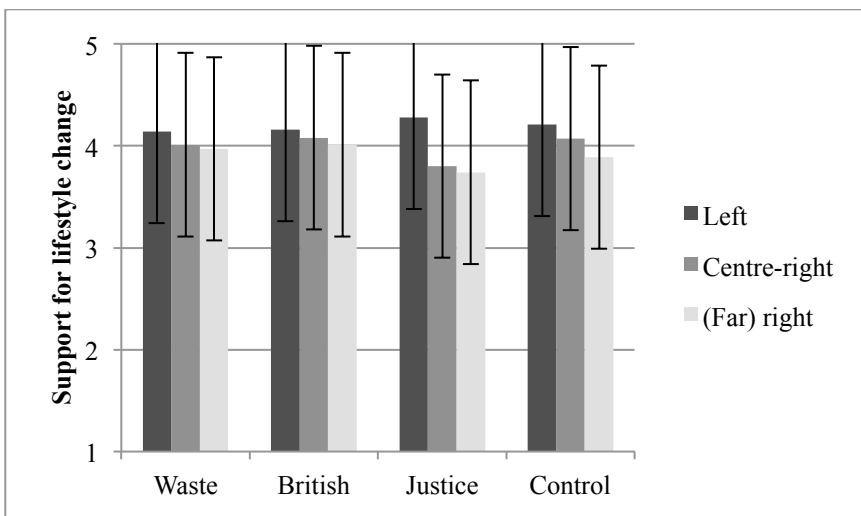
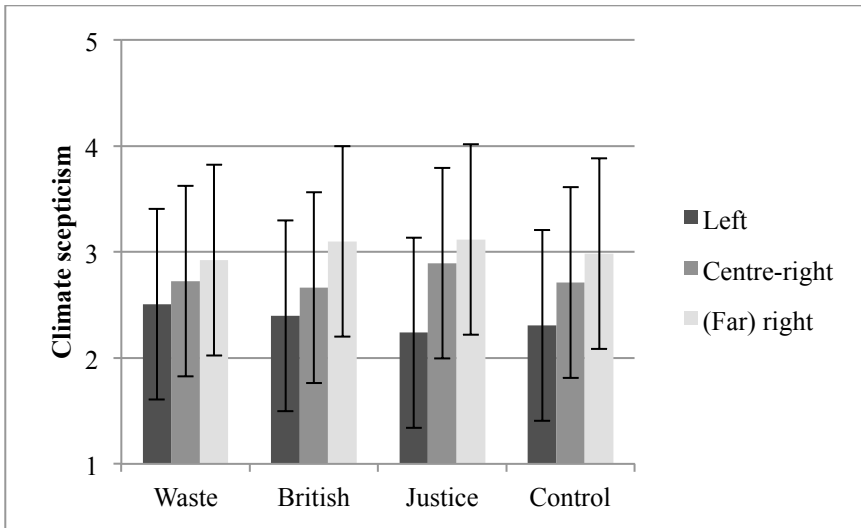
<i>DV</i>	<i>(I) Narrative</i>	<i>(I) Mean (SD)</i>	<i>(J) Narrative</i>	<i>Mean Difference (I-J)</i>
Article agreement	Waste	4.91 (1.30)	British	0.11
			Justice	.23*

	British	4.81 (1.33)	Justice	0.13
			Control	.31***
	Justice	4.68 (1.40)	Control	0.18
	Control	4.50 (1.15)	Waste	-.41***
Article reactance	Waste	3.77 (1.47)	British	-0.06
			Justice	-0.11
	British	3.82 (1.50)	Justice	-0.05
			Control	.62***
	Justice	3.88 (1.48)	Control	.67***
	Control	3.21 (1.38)	Waste	-.56***
Climate change concern	Waste	2.93 (.83)	British	-0.03
			Justice	0.00
	British	2.96 (.83)	Justice	0.03
			Control	0.01
	Justice	2.93 (.85)	Control	-0.02
	Control	2.95 (.81)	Waste	0.02
Risk perception	Waste	3.79 (.88)	British	-0.05
			Justice	0.09
	British	3.84 (.89)	Justice	0.14
			Control	0.06
	Justice	3.70 (.91)	Control	-0.08
	Control	3.78 (.89)	Waste	-0.01
Climate scepticism	Waste	2.72 (1.01)	British	0.00
			Justice	-0.06
	British	2.72 (1.05)	Justice	-0.06
			Control	0.03
	Justice	2.79 (1.06)	Control	0.10
	Control	2.69 (1.00)	Waste	-0.03
Support for government policy	Waste	3.95 (1.09)	British	-0.09
			Justice	-0.04
	British	4.03 (1.07)	Justice	0.05
			Control	0.03
	Justice	3.98 (1.12)	Control	-0.02
	Control	4.00 (1.02)	Waste	0.06
Support for lifestyle change	Waste	4.05 (.99)	British	-0.04
			Justice	0.11
	British	4.09 (1.00)	Justice	0.15
			Control	0.03
	Justice	3.94 (1.04)	Control	-0.12
	Control	4.05 (.94)	Waste	0.01
Willingness to act	Waste	4.92 (1.35)	British	0.00
			Justice	0.07
	British	4.93 (1.39)	Justice	0.07
			Control	0.05
	Justice	4.85 (1.31)	Control	-0.02
	Control	4.89 (1.31)	Waste	-0.04

There were also significant, but weak, interaction effects in the case of three DVs (article agreement, reactance and scepticism) and one marginal effect ($p=0.07$) for support for lifestyle change. Figures 1-4 show these interactions, which reveal that Waste, and to a lesser extent British, elicited broad agreement across ideology groups; while Justice polarised groups, with left-wing respondents showing highest agreement, and (far) right groups showing least. The opposite pattern was evident for article reactance, with Waste and British narratives showing similar responses (though rather higher for (far) right respondents), and Justice polarising opinion ((far) right having highest reactance and left-wing having lowest). Scepticism and support for lifestyle change again showed some convergence across groups for Waste and most polarisation for Justice. It is interesting to note that the centre-right group appears sometimes to be positioned closer to (far) right respondents (e.g., in responses to the Justice narrative) and sometimes closer to left-wing respondents (e.g., in responses to the British narrative). This draws attention to the fluidity of these categories, which we address in the next sub-section.

Figures 1-4. Interactions between narratives and political ideology (error bars +/- 1 SD)





3.2.2 Regression analyses

Since MANOVA requires using categorical variables for IVs, this risks losing variance in the political ideology scale. Step-wise regression analyses were therefore conducted on all eight DVs, with political ideology entered as a continuous variable with experimental condition as dummy variables, and interaction terms also entered. Demographics, voting intention, pro-environmental identity and cultural cognition were entered as covariates.

This analysis (see Appendix 4) found that pro-environmental identity, cultural cognition, voting intention, and some demographics (particularly gender) show effects across most or all DVs. There were some significant effects of ideology, specifically for article agreement and climate scepticism. Condition was a significant predictor in several cases: agreement was significantly higher for all experimental conditions compared to the control text; reactance was lower for the Justice text; while the British narrative reduced support for lifestyle change.

Of most relevance, interactions were confirmed as significant between condition and ideology for agreement (Waste $\beta=-.24$, $t(2087)=-3.70$, $p<.001$; British $\beta=-.30$, $t(2087)=-4.51$, $p<.001$; Justice $\beta=-.46$, $t(2087)=-6.99$, $p<.001$), reactance (Waste $\beta=.19$, $t(2087)=2.73$, $p<.01$; British $\beta=.14$, $t(2087)=1.98$, $p<.05$; Justice $\beta=.34$, $t(2087)=4.92$, $p<.001$), lifestyle change (British $\beta=.18$, $t(2087)=2.84$, $p<.01$), and marginally for risk perception (0.07; British $\beta=.11$, $t(2087)=1.82$, $p=.07$). Specifically, agreement was lowest and reactance highest for right-wing respondents reading the Justice narrative (with agreement highest for the Waste narrative); while right-wing respondents were more likely to support lifestyle change (and see climate change as a risk) when reading the British narrative. This was broadly consistent with our MANOVA findings, although the interaction between ideology and condition was no longer significant for climate scepticism.

3.3 Discussion

Study 2 found small but distinct preferences among participants for different narratives. While the ‘Waste’ narrative elicited broad agreement amongst participants across the political spectrum, the ‘Justice’ narrative was significantly less appealing, and indeed polarised participants along political lines. Controlling for pro-environmental identity, voting intention and demographics, right-wing respondents were most likely to agree with the ‘Waste’ narrative and most likely to support lifestyle change (and – marginally – to see climate change as a risk) when reading the ‘Great British Energy’ narrative. Not only do these findings provide quantitative support for the patterns observed in Study 1, they suggest that narratives which are more engaging for centre-right audiences are also not *disengaging* for members of the public from across the political spectrum. However, reactance among right-leaning participants was higher for all narratives than for a non-climate change message. That is, *all* of the narratives produced an elevated sense of exaggeration or hyperbole among right-wing participants, relative to the control condition, suggesting a general anti-climate messaging response, and representing a significant challenge for climate change communication practitioners seeking to engage this audience.

4 General discussion & conclusions

To date, little work has examined how to promote public engagement with climate change across the political spectrum, despite clear evidence that political orientation and ideology are very strong influences on climate change attitudes and responses (e.g., Hornsey et al., 2016). This paper reported on novel mixed-methods research in the UK to develop and test a series of narratives to engage citizens with centre-right political views. Qualitative work with centre-right voters revealed two

particularly promising narratives: the first focused on the idea that saving energy is predicated on the ‘conservative’ principle of avoiding waste (‘Waste’); the second focused on the advantages of ‘Great British Energy’ (based on domestic low-carbon technologies). An online experiment with a representative sample compared these narratives with a more typically left-of-centre narrative focused on the concept of ‘Climate Justice’ with a representative sample of the UK public.

While the ‘Waste’ narrative elicited broad agreement amongst centre-right participants in Study 1, and across the political spectrum in Study 2, the ‘Justice’ narrative tested in Study 2 polarised participants along political lines, offering a clear indication for language to use and avoid, for practitioners seeking to initiate constructive dialogue about climate change across the British political spectrum. These findings also suggest that narratives which more effectively engage centre-right audiences will not necessarily ‘turn off’ members of the public from across the political spectrum – a novel and practically important result. There was also some evidence that the ‘Great British Energy’ narrative was more likely to lead to support for lifestyle change to tackle climate change amongst right-wing respondents.

These findings are largely consistent with previous US research which has shown that framing climate change action around conservative values can engage right-of-centre audiences (e.g., Wolsko et al., 2016). Our research here extends this beyond the US to show that narrative reframing can help overcome traditional resistance to climate change messages amongst the UK centre-right. This is important not only for the UK context, in which political polarisation has been a key feature of public debate around climate change, but also has implications for any societal context in which political polarisation is evident. The narrative workshop methodology is flexible and context-specific, grounding narratives in audience values, and is applicable to other cultures and topics (Marshall, 2014). In addition, though, the content of the narratives developed here are likely to appeal to audiences beyond the UK. For example, we would expect the Waste narrative to be relevant in many other developed countries, particularly at a time when economic policies of ‘austerity’ are dominant. Furthermore, the ethic of frugality, which has a long tradition in Western philosophy (Xenos, submitted), has been found previously to resonate widely amongst the public, including amongst those who otherwise have little interest in environmental issues (Evans & Abrahamse, 2008). This suggests fertile ground for public engagement with sustainable lifestyles and environmental policies without recourse to an overtly ‘pro-environmental’ argument.

The current study was conducted shortly before the referendum in the UK regarding membership of the European Union, the environmental policy implications of which are currently unclear, although the government reaffirmed its commitment to tackling climate change in the recent Fifth Carbon Budget. In any case, we would not expect political polarisation in respect of climate change, which is grounded in fundamental values and worldviews, to be significantly affected by the vote or the UK's departure from the EU (Goren, 2005): the result of the referendum itself, and wider global trends with regards to political populism, suggest that understanding and finding ways of managing political polarisation is an extremely timely goal.

We have also provided some insight into *why* certain concepts and themes are more effective as well as those narrative elements which are less effective and might serve to further disengage audiences. In particular, Study 1 showed that actual or implied message source was a key condition for acceptance. Consistent with this, we found that the health and economic framings were not always accepted, despite indications from US research that they can serve as effective climate change frames (Myers et al., 2012; Bain et al., 2012), because of a distrusted (perceived outgroup or self-interested) source or the perception of hyperbolic statistical claims. This is consistent with dominant persuasion and communication theories which posit that 'messenger' is at least as important as 'message' in determining how a particular communication is received (e.g., Petty & Cacioppo, 1986), and with previous climate change communication research that shows identification with message source as a key determinant of attitude change (Wolsko et al., 2016; cf. Kahan et al., 2011).

While we observed (small) consistent effects on judgments of the acceptability of the narratives (i.e., agreement and reactance), in common with many other message-framing experiments, evidence of changes in underlying beliefs about and responses to climate change was less clear. The cluster of questions used to capture reactance to the narratives in Study 2 showed that *all* of the experimental conditions produced an elevated sense of exaggeration or hyperbole among right-leaning participants, relative to the control condition. This is consistent with previous research that has observed a 'backfire' effect: Gromet et al. (2013) found that, relative to the absence of a message, pro-environmental messages tended to impact negatively on the attitudes and behaviours of conservative participants. The findings also echo several recent studies which have failed to observe any consistent impact in terms of attitude change as a result of differentially framed messages (McCright et al, 2015; Bernauer & McGrath, 2016). This has been explained in terms of the 'pre-treatment environment' (i.e., everyday contact with climate change messages) which have a much stronger influence on participants' climate change attitudes than a brief experimental manipulation

(Bernauer & McGrath, 2016). Taken together, the evidence suggests that engaging centre-right audiences – even with the most effective language – is not straightforward. Future research might explore whether avoiding any mention of climate change in the narratives might produce more pronounced attitudinal effects. We were interested in how framing might shape support for climate change policy and lifestyle change, the former requiring some explicit mention of the issue. Communicating efforts aimed at fostering low-carbon lifestyles alone, however, might well be more persuasive if co-benefits (to health, community cohesion, etc.) are emphasised over environmental benefits (cf. Bain et al., 2012).

However, we caution against undue pessimism. A strength of the current study is that the narratives were explored using mixed-methods research. Most framing research, on the other hand, involves a process of truncated and ‘one way’ communication: participants are exposed to messages that differ in relatively minor ways. Our findings – synthesising across both studies reported here – suggest that while there are no ‘magic words’ that can overcome deep-rooted cynicism or disinterest, people have clear preferences for different narratives. The value of deploying these different linguistic frameworks in communication is as more or less effective tools for beginning a conversation, not necessarily for ‘winning an argument’. Starting a conversation with someone on terms they are comfortable with is the first step to building – and sustaining – their engagement. This suggests that the insights gained from these studies should be applied in participatory, dialogic contexts, where more substantive levels of engagement are likely to be engendered in a genuinely conversational setting, and defensive reactions to explicitly persuasive communications are less likely (cf. Max-Neef, 1991).

5 References

- Abell, P. (1987). *The Syntax of Social Life: the theory and Method of Comparative Narratives*, Oxford University Press, Oxford.
- Adams, I. (2001). *Political ideology today*. Manchester: Manchester University Press.
- Aspelund, A., Lindeman, M. & Verkasalo, M. (2013). Political Conservatism and Left-Right Orientation in 28 Eastern and Western European Countries. *Political Psychology*, 34, 409–417.
- Bain, P.G., Hornsey, M.J., Bongiorno, R. & Jeffries, C. (2012). Promoting pro-environmental action in climate change deniers. *Nature Climate Change*, 2(4), 1–4. doi:10.1038/nclimate1532
- Bernauer, T. & McGrath, L.F. (2016). Simple reframing unlikely to boost public support for climate policy. *Nature Climate Change* doi:10.1038/nclimate2948

- Brown, K.W. & Kasser, T. (2005). Are psychological and ecological well-being compatible? The role of values, mindfulness, and lifestyle. *Social Indicators Research*, 74, 349–368.
- Burke, E. (1910). *Reflections on the Revolution in France*. Dent, London.
- Capstick, S., Whitmarsh, L., Poortinga, W. & Pidgeon, N. (2014). International trends in public understanding of climate change over the past quarter century. *WIREs: Climate Change*. doi: 10.1002/wcc.321
- Capstick, S.B., Demski, C.C., Sposato, R.G., Pidgeon, N.F., Spence, A. & Corner, A. (2015). *Public perceptions of climate change in Britain following the winter 2013/2014 flooding*. Understanding Risk Research Group Working Paper 15-01, Cardiff University, Cardiff, UK.
- Campbell, T.H. & Kay, A.C. (2014). Solution Aversion: On the Relation Between Ideology and Motivated Disbelief. *Journal of Personality and Social Psychology* 107(5), 809 – 824.
- Clayton, S., Devine-Wright, P., Stern, P., et al. (2015). Psychological Research and Global Climate Change. *Nature Climate Change*, 5, 640-646. doi:10.1038/nclimate2622.
- Corner, A. (2013). *A new conversation with the centre-right about climate change*. Oxford: Climate Outreach. Climate Outreach.
- Corner, A.J., Markowitz, E. & Pidgeon, N.F. (2014). Public engagement with climate change: the role of human values. *WIREs: Climate Change*, 5(3), 411-422.
- Corner, A., Marshall, G. & Clarke, J. (2016). *Communicating effectively with the centre-right about household energy-efficiency and renewable energy technologies*. Oxford: Climate Outreach.
- Corner, A. & Roberts, O. (2014). *How narrative workshops informed a national climate change campaign: 'For The Love Of'*. Oxford: Climate Outreach. Available online: <http://climateoutreach.org/resources/climate-and-national-identity>
- Crompton, T. (2010). *Common Cause: The Case for Working with our Cultural Values*. United Kingdom: WWF.
- De Groot, J. & Steg, L. (2008) Value Orientations to Explain Beliefs Related to Environmental Significant Behavior, *Environment and Behaviour*, 40 (3), 330-354.
- Dietz, T., Fitzgerald, A., & Shwom, R. (2005). Environmental Values. *Annual Review of Environment and Resources* 30, 335-372
- Douglas, M. & Wildavsky, A.B. (1982) *Risk and Culture: An Essay on the Selection of Technical and Environmental Dangers*, California: University of California Press.
- Evans, D. & Abrahamse, W. (2008). *Beyond Rhetoric: the Possibilities of and for 'Sustainable Lifestyles'*. RESOLVE Working Paper 06-08. <http://www.surrey.ac.uk/resolve>
- Feinberg, M., & Willer, R. (2013). The moral roots of environmental attitudes. *Psychological Science*, 24(1), 56–62.

- Feygina, I., Jost, J., & Goldsmith, R. (2010). System justification, the denial of global warming, and the possibility of “system-sanctioned change”. *Personality and Social Psychology Bulletin*, 36(3), 326–338.
- Fløttum, K. & Gjerstad, O. (2016). Narratives in climate change discourse. *WIREs Climate Change*. doi: 10.1002/wcc.429
- Goren, P. (2005). Party identification and core political values. *American Journal of Political Science*, 49, 881–896.
- Green, E.H.H. (2004). *Ideologies of Conservatism: Conservative Political Ideas in the Twentieth Century*. Oxford: Oxford University Press.
- Gromet DM, Kunreuther H., & Larrick RP. (2013). Political ideology affects energy efficiency attitudes and choices. *Proc Natl Acad Sci* 110(23):9191–9192.
- Herman, D. (2013). *Narrative Theory and the Cognitive Sciences*. USA: Center for the Study of Language and Information.
- HM Government. (2008). *Climate Change Act*. London.
- Hornsey, M.J., Harris, E.A., Bain, P.G., & Fielding, K.S. (2016). Meta-analyses of the determinants and outcomes of belief in climate change. *Nature Climate Change*, in press. DOI: 10.1038/nclimate2943
- Hulme, M. (2009). *Why we disagree about climate change: Understanding controversy, inaction and opportunity*. Cambridge, UK: Cambridge University Press.
- Kahan, D.M., Jenkins-Smith, H., & Braman, D. (2011). Cultural cognition of scientific consensus. *Journal of Risk Research*, 14, 147-174.
- Kahan, D., Peters, E., Witlin, M., Slovic, P., Ouelette, L., Braman, D., & Mandel, G. (2012). The polarizing impact of science literacy and numeracy on perceived climate change risks. *Nature Climate Change*, 2, 732–735.
- Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., & Rosenthal, S. (2015). *Politics and global warming, Fall 2015*. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication.
- Leviston, Z. & Walker, I. (2011). *Baseline Survey of Australian Attitudes to Climate Change: Preliminary Report*. Commonwealth Scientific and Industrial Research Organisation. Available from: <https://publications.csiro.au/rpr/download?pid=csiro:EP105359&dsid=DS3> (accessed 22 Sept 2016).
- Lord, J., Whitmarsh, L., & Poortinga, W. (2016). Developing a cultural cognition scale for the UK. Manuscript in preparation.
- Marshall, G. (2014c) *Hearth and Hiraeth: Constructing Climate Change Narratives around National*

Identity. Climate Outreach Information Network, Oxford.

- Max-Neef, M., 1991. *Human Scale Development: Conception, application and further reflections*. New York: The Apex Press.
- McCright, A., & Dunlap, R. (2011). The politicization of climate change and polarization in the American public's views of global warming, 2001–2010. *The Sociological Quarterly*, 52(2), 155–194.
- McCright, A. et al. (2015). Examining the Effectiveness of Climate Change Frames in the Face of a Climate Change Denial Counter-Frame. *Topics in Cognitive Science*, 8 (1), 76-97.
- Mocker, V. (2012). Blue valuing Green: Are intrinsic value frames better than economic arguments to communicate climate change and transport policies to Conservative audiences? Oxford.
- Myers, T.A., Nisbet, M.C., Maibach, E.W. & Leiserowitz, A.A. (2012). A public health frame arouses hopeful emotions about climate change. *Climatic Change* 113, 1105-1112.
- Painter, J. & Ashe, T. (2012). Cross-national comparison of the presence of climate scepticism in the print media in six countries, 2007–10. *Environmental Research Letters*, 7:044005.
- Petty, R.E., & Cacioppo, J.T. (1986). The elaboration likelihood model of persuasion. *Advances in Experimental Social Psychology*, 19, 123–205.
- Poortinga, W., Steg, L., & Vlek, C. (2004). Values, environmental concern and environmental behaviour: a study into household energy use. *Environment and Behaviour*, 36, 70–93.
- Schwartz, S.H. (1992). *Universals in the Content and Structure of Values: Theoretical Advances and Empirical Tests in 20 Countries*. United Kingdom: Academic Press, Inc.
- Scruton, R. (2012). *How to Think Seriously About the Planet: The Case for an Environmental Conservatism*. Oxford: Oxford University Press.
- Sheldon, K.M., & Nichols, C.P. (2009). Comparing democrats and republicans on intrinsic and extrinsic values. *Journal of Applied Social Psychology*, 39, 589–623.
- Shrubsole, G. (2011). The environment and conservative values. In D. Boyle, T. Crompton, M. Kirk, & G. Shrubsole (Eds.), *Different Politics, Same Planet. Values for sustainable development beyond left and right* (pp. 33–44). PIRC.
- Smith, J., Tyszczuk, R. & Butler, R. eds. (2014). Culture and Climate Change: Narratives. *Culture and Climate Change*, 2. Cambridge, UK: Shed.
- Spence, A., Poortinga, W., Butler, C., & Pidgeon, N.F. (2011). Perceptions of climate change and willingness to save energy related to flood experience. *Nature Climate Change*, 1, 46-49.
- Stern, P.C., Dietz, T. & Kalof, L. (1993). Value Orientations, Gender, and Environmental Concern. *Environment and Behavior* 25, 322-348
- UNFCCC (2015). *Adoption of the Paris Agreement. UN Framework Convention on Climate Change*.

<https://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf>

- Whitmarsh, L. (2011). Scepticism and uncertainty about climate change: dimensions, determinants and change over time. *Global Environmental Change, 21*, 690–700.
- Whitmarsh, L., Nash, N., Upham, P., Lloyd, A., Verdon, J. & Kendall, M. (2015). UK public perceptions of shale gas hydraulic fracturing: The role of audience, message and contextual factors on risk perceptions and policy support. *Applied Energy, 15*, 419-430.
- Whitmarsh, L. & O'Neill, S. (2010). Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours. *Journal of Environmental Psychology, 30*, 305–314.
- Witte, K., Berkowitz, J. M., Cameron, K. A., & McKeon, J. K. (1998). Preventing the spread of genital warts: Using fear appeals to promote self-protective behaviors. *Health Education and Behavior, 25*, 571–585.
- Wolf, J. & Moser, S.C. (2011). Individual understandings, perceptions, and engagement with climate change: insights from in-depth studies across the world. *WIREs: Climate Change, 2*, 547-569.
- Wolsko, C., Ariceaga, H. & Seiden, J. (2016). Red, white, and blue enough to be green: Effects of moral framing on climate change attitudes and conservation behaviors. *Journal of Experimental Social Psychology 65*, 7–19
- Xenos, N. (submitted). The austere life. *Philosophical Transactions of the Royal Society of London. Series A*.
- Zia, A., and Todd, A.M. (2010). Evaluating the effects of ideology on public understanding of climate change science: How to improve communication across ideological divides? *Public Understanding of Climate Change 19* (6) 743-761.

Appendices

1 Study 1 narrative texts

Narrative 1: Avoiding waste is common sense

No-one likes to see things go to waste: it's just common sense. If you bring your kids up well, you teach them that it is irresponsible to waste things - to finish their dinner and not throw away food, and to turn off lights in rooms when they are not using them. But millions of us live in old houses filled with gaps and holes that are draughty in the winter – we're literally throwing energy away. Insulating them means we get warmer homes that are cosier, more comfortable to live in and better for our health. That's what energy efficiency is about: who can argue with the idea of doing more with less? Conserving energy is a conservative thing to do. It is lovely if you live in a neighbourhood where there is hardly any litter. More and more people are composting their food waste, and almost everything the council pick up from people's houses is recycled. It feels like we are really getting somewhere with packaging and recycling. So then it doesn't make sense when you see offices across the city with their lights on, wasting electricity. It's no better than fly tipping, wasting energy when you don't need to. It's our energy – so it's only fair that we should all use it responsibly, and not waste it for no good reason.

Narrative 2: Health & quality of life

Any sensible person can't help but be troubled by the condition of the pavements, vandalism and crime, litter and the cleanliness of the air we breathe. These are all environmental issues that affect our quality of life, and climate change is exactly the same. The winter floods in 2013/14 destroyed billions of pounds of property. Homes that people had worked hard and saved for all their lives were ruined. Taking practical steps to keep these threats at bay is a sensible response. Doctors and the British Medical Association tell us that unchecked climate change will increase asthma, heatstroke and allergies, with serious impacts on the health of the youngest and oldest people. Using cleaner forms of energy such as solar and wind power to control our carbon emissions will reduce air and water pollution. And cleaner air saves lives. Poorly insulated homes are making life miserable for elderly people who have worked hard all their lives, and don't deserve to spend their later years in cold or damp conditions. Every winter 10,000 people die in the UK because they live in a cold home – that's more than die from drugs, car accidents or alcohol-related diseases. So getting to grips with our leaky houses is really about improving our quality of life –and saving the lives of people who deserve better.

Narrative 3: Great British Energy

No one really wants to live next door to a wind turbine. But ask yourself this: would you rather live next door to a wind turbine or a fracking well? Local democracy is the backbone of Britain, so decisions about energy technologies should be taken by local communities. We have to make the right choices to preserve the landscape and countryside of Britain for our children and grandchildren, as well as the millions of people

who live and work in the countryside right now. Over the years, we have cleaned up our rivers, banished smog from our cities, and protected our forests. But climate change poses even greater dangers: more frequent and extreme flooding causing damage to our homes and livelihoods, disruption to seasonal changes, and the wildlife which depends on them. Perhaps we cannot be completely self-sufficient, but we can do a lot better at producing our own energy, through community-owned solar and wind projects. We need to learn from places like Germany that are way out in front on this. They've got hundreds of small energy enterprises where people share in the profits and have a real sense of pride, ownership and responsibility. There's no reason we couldn't do the same. Clean energy technologies are a golden opportunity to rebuild our manufacturing base – Great British Energy that will provide jobs for thousands, represent a sound investment in the future, and ensure that we leave a strong legacy for future generations.

Narrative 4: The Smart Money

Sometimes people talk about wind or solar as 'alternative' technologies. But they're not any more: they are very much part of the mainstream. Investment in clean energy has exploded – more than \$1,462 billion since the start of 2010, and the world is adding more capacity in renewable power each year than coal, gas and oil combined. The price of renewables is falling dramatically: the smart money is in the clean energy sector. That's why calls for 'divestment' and taking money out of the fossil fuel industry have struck a chord. We shouldn't demonise a sector that has done so much for billions of people's living standards, but we need to recognise that the future lies in renewable technologies like solar and wind, not in the fossil fuels of the 20th century. The short-term costs associated with creating a lean, green economy will deliver longterm benefits for everyone. Insulating properties now (and making them more efficient) will cut down the amount of wasted energy, and put money in people's pockets. It's good business-sense, which is why more and more big businesses 'get it'. Ikea, Unilever, Marks & Spencers are all taking climate change and sustainability very, very seriously – because it is a serious issue. Just like a sound investment strategy, a responsible, long-term energy policy demands a willingness to take decisions today for the good of tomorrow. And a reliable, resilient energy system will power the economy.

2 Study 2 narrative texts

'Waste' narrative:

"No-one likes to see things go to waste: it's just common sense. You bring your kids up to think that it's irresponsible to waste things - to finish their dinner and not throw away food, and to turn off appliances when they're not using them. Millions of people live in old houses filled with gaps and holes that are drafty in the winter – we're effectively throwing energy away.

To me, tackling climate change is about avoiding waste, conserving energy, and finding a way of doing more with less – that's something that's important to me.

That's why I agree that the government should sign up to an international agreement to tackle climate change, and I think the people of Britain have a role to play in making changes to our own lifestyles to reduce our impact on the environment. We all have a responsibility to not be wasteful with the resources we have."

‘Great British Energy’ narrative:

"Democracy is the backbone of Britain, so decisions about energy technologies should be taken by the British people. We have to make the right choices for our children and grandchildren, and invest in clean energy technologies, which are a golden opportunity to rebuild our manufacturing base. Perhaps we cannot be completely self-sufficient, but we can do a lot better at producing our own energy, through British-made solar and wind technologies.

To me, tackling climate change is about supporting British manufacturing and technology, and creating more green jobs - that's something that is important to me.

That's why I agree that the government should sign up to an international agreement to tackle climate change, and I think the people of Britain have a role to play in making changes to our own lifestyles to reduce our impact on the environment. Great British Energy based on clean energy is a sound investment in the future."

‘Justice’ narrative:

"The poorest people in the world are the ones who will suffer the most from the impacts of climate change, but they've done the least to cause it. We need to take a look at ourselves and realise that our way-of-life isn't sustainable. It's only fair that those with more resources do more to tackle climate change and help those who are more vulnerable avoid the worst of the impacts.

To me, tackling climate change is about justice and putting pressure on governments to help the poorest people survive climate chaos - that's something that is important to me.

That's why I agree that the government should sign up to an international agreement to tackle climate change, and I think the people of Britain have a role to play in making changes to our own lifestyles to reduce our impact on the environment. Climate justice means those who are more responsible for causing climate change doing more to tackle it."

3 Manipulation check for Study 2

As a manipulation check, participants were asked which of five statements was mentioned in the article they had read. The Table below shows that the majority of respondents correctly identified the relevant statement. Chi-square analysis confirms a significant difference between conditions $\chi^2(12, 2087) = 3137.05, p < 0.001$.

		<i>Experimental condition</i>				
		<i>Waste</i>	<i>British</i>	<i>Justice</i>	<i>Control</i>	<i>Total</i>
Millions of people live in drafty old homes in this country	N	338	27	27	11	403
	% of condition	64.00%	5.30%	5.20%	2.10%	19.30%
We have an opportunity to rebuild our manufacturing base	N	33	324	25	16	398
	% of condition	6.20%	63.50%	4.80%	3.00%	19.10%
Poor people will suffer most from climate impacts	N	130	138	447	38	753
	% of condition	24.60%	27.10%	85.30%	7.20%	36.10%
Many new cars have a puncture repair kit	N	10	5	11	444	470
	% of condition	1.90%	1.00%	2.10%	84.40%	22.50%
Most people do not bother to spring clean their homes	N	17	16	14	17	64
	% of condition	3.20%	3.10%	2.70%	3.20%	3.10%
<i>Total</i>	N	528	510	524	526	2088
	% of condition	100%	100%	100%	100%	100%

Study 2 regression analyses for responses to narratives and climate change perceptions/responses (significant predictors in bold)

	Article agreement				Article reactance				Climate change concern				Risk perception				
	Model (R ²)	Beta	t	Sig.	Model (R ²)	Beta	t	Sig.	Model (R ²)	Beta	t	Sig.	Model (R ²)	Beta	t	Sig.	Sig.
(Constant)			4.75	0.00			9.84	0.00			7.02	0.00			10.68	0.00	0.00
	1				1				1				1				
Gender (male)	(.03*)	-0.02	-0.82	0.42	(.04*)	0.05	2.25	0.03	(.03*)	-0.06	-2.99	0.00	(.03*)	-0.04	-2.29	0.02	0.01
Age_25-34		0.02	0.80	0.43		-0.01	-0.51	0.61		-0.05	-1.64	0.10		-0.01	-0.27	0.79	0.30
Age_35-44		0.03	1.14	0.26		-0.03	-0.96	0.34		-0.04	-1.53	0.13		-0.01	-0.31	0.76	0.32
Age_45-54		0.01	0.23	0.82		-0.04	-1.54	0.12		-0.09	-3.15	0.00		-0.05	-1.84	0.07	0.31
Age_55-64		0.04	1.51	0.13		-0.05	-1.78	0.08		-0.09	-2.93	0.00		0.00	0.06	0.95	0.75
Age_65+		0.07	2.37	0.02		-0.08	-2.36	0.02		-0.08	-2.54	0.01		-0.02	-0.79	0.43	0.04
Location_England		0.08	1.36	0.18		-0.08	-1.23	0.22		-0.08	-1.28	0.20		0.04	0.63	0.53	0.55
Location_Wales		0.04	1.12	0.26		-0.03	-0.74	0.46		-0.04	-0.95	0.34		0.03	0.79	0.43	0.96
Location_Scotland		0.07	1.20	0.23		-0.07	-1.17	0.24		-0.07	-1.21	0.23		0.05	1.01	0.31	0.68
Ethnicity_black		0.02	0.63	0.53		-0.04	-1.46	0.14		-0.04	-1.40	0.16		-0.03	-1.32	0.19	0.72
Ethnicity_white		-0.04	-0.97	0.33		-0.01	-0.32	0.75		-0.06	-1.50	0.13		-0.05	-1.50	0.14	0.50
Ethnicity_asian		-0.02	-0.54	0.59		0.02	0.55	0.58		-0.04	-1.12	0.27		-0.01	-0.48	0.63	0.06
Education_gcse		-0.07	-1.73	0.08		-0.01	-0.30	0.77		0.04	0.89	0.37		-0.10	-2.83	0.01	0.02
Education_alevel		-0.07	-1.58	0.12		0.00	0.03	0.98		0.02	0.49	0.62		-0.06	-1.64	0.10	0.09
Education_vocational		-0.03	-0.87	0.39		-0.03	-0.63	0.53		0.04	0.93	0.35		-0.08	-2.22	0.03	0.07
Education_undergrad		-0.07	-1.51	0.13		-0.04	-0.87	0.38		0.04	0.73	0.47		-0.13	-3.08	0.00	0.03
Education_postgrad		0.01	0.19	0.85		-0.03	-0.81	0.42		0.05	1.15	0.25		-0.07	-1.97	0.05	0.26
Rurality_suburban		0.02	0.93	0.36		-0.07	-3.19	0.00		-0.05	-2.08	0.04		-0.04	-2.07	0.04	0.06
Rurality_rural		-0.01	-0.35	0.73		-0.04	-1.64	0.10		-0.07	-3.07	0.00		-0.05	-2.77	0.01	0.01
Condition_waste	2	0.37	5.77	0.00	2	-0.02	-0.26	0.80	2	0.04	0.63	0.53	2	-0.04	-0.66	0.51	0.75
Condition_British	(.04*)	0.39	5.93	0.00	(.07*)	0.04	0.63	0.53	(.03)	-0.08	-1.17	0.24	(.04)	-0.06	-1.07	0.28	0.85
Condition_Justice		0.50	7.81	0.00		-0.13	-1.96	0.05		0.03	0.49	0.63		-0.03	-0.44	0.66	0.41
Pro-env. identity	3	0.47	23.66	0.00	3	-0.32	-15.19	0.00	3	0.40	18.90	0.00	3	0.58	32.42	0.00	0.00
Individualism	(.31*)	-0.12	-5.93	0.00	(.22*)	0.02	0.99	0.32	(.21*)	-0.05	-2.37	0.02	(.44*)	-0.13	-7.11	0.00	0.00
Hierarchism		-0.08	-3.39	0.00		0.13	5.49	0.00		-0.04	-1.56	0.12		-0.08	-4.09	0.00	0.00
Politics_conservative	4	0.04	0.80	0.42	4 (.22)	0.02	0.33	0.74	4 (.21)	-0.11	-1.95	0.05	4	0.05	1.07	0.29	0.07
Politics_labour	(.31)	0.06	1.15	0.25		0.06	1.06	0.29		-0.05	-0.97	0.33	(.44)	0.08	1.76	0.08	0.00
Politics_libdem		0.04	1.20	0.23		-0.02	-0.43	0.67		-0.05	-1.33	0.18		0.05	1.80	0.07	0.01
Politics_snp		0.05	1.66	0.10		0.01	0.28	0.78		0.01	0.42	0.68		0.04	1.51	0.13	0.06
Politics_ukip		0.01	0.18	0.86		0.03	0.81	0.42		-0.07	-1.62	0.10		0.02	0.43	0.67	0.20
Politics_green		0.00	-0.10	0.92		0.02	0.82	0.41		-0.03	-0.90	0.37		0.04	1.43	0.15	0.01
Political ideology (PI)	5	0.18	4.30	0.00	5	-0.05	-1.08	0.28	5	-0.03	-0.62	0.54	5	-0.06	-1.62	0.11	0.45
Waste x PI	(.31)	0.18	4.30	0.00	(.23*)	-0.05	-1.08	0.28	(.21)	-0.03	-0.62	0.54	(.44)	-0.06	-1.62	0.11	0.45
British x PI	6	-0.24	-3.70	0.00	6	0.19	2.73	0.01	6	-0.03	-0.45	0.65	6	0.06	0.97	0.33	0.99
Justice x PI	(.33*)	-0.30	-4.51	0.00	(.24*)	0.14	1.98	0.05	(.21)	0.10	1.41	0.16	(.44)	0.11	1.82	0.07	0.78
		-0.46	-6.99	0.00		0.34	4.92	0.00		-0.01	-0.11	0.92		0.01	0.15	0.88	0.58

	Climate scepticism				Support gov't action				Support lifestyle change				Willingness to act			
	Model (R ²)	Beta	t	Sig.	Model (R ²)	Beta	t	Sig.	Model (R ²)	Beta	t	Sig.	Model (R ²)	Beta	t	Sig.
(Constant)			12.63	0.00			8.47	0.00			9.04	0.00			6.62	0.00
	1				1				1				1			
Gender (male)	(.04*)	0.02	1.28	0.20	(.02*)	0.01	0.59	0.56	(.04*)	-0.06	-3.10	0.00	(.04*)	-0.04	-2.48	0.01
Age_25-34		0.02	0.96	0.34		0.00	-0.17	0.87		0.01	0.45	0.66		0.02	1.04	0.30
Age_35-44		-0.01	-0.23	0.82		0.03	1.00	0.32		0.03	1.01	0.31		0.02	0.99	0.32
Age_45-54		0.01	0.39	0.70		-0.03	-1.14	0.26		-0.01	-0.34	0.73		-0.02	-1.02	0.31
Age_55-64		-0.01	-0.48	0.63		0.02	0.85	0.40		0.04	1.49	0.14		-0.01	-0.32	0.75
Age_65+		0.01	0.49	0.62		0.02	0.58	0.56		0.03	0.91	0.36		-0.05	-2.05	0.04
Location_England		-0.02	-0.42	0.67		0.02	0.33	0.74		0.06	1.04	0.30		-0.03	-0.60	0.55
Location_Wales		0.00	-0.06	0.95		0.02	0.49	0.63		0.05	1.28	0.20		0.00	-0.05	0.96
Location_Scotland		-0.01	-0.14	0.89		0.00	-0.07	0.95		0.03	0.48	0.63		-0.02	-0.42	0.68
Ethnicity_black		-0.01	-0.22	0.83		-0.02	-0.66	0.51		-0.02	-0.78	0.44		0.01	0.36	0.72
Ethnicity_white		-0.02	-0.73	0.47		-0.01	-0.39	0.70		0.01	0.36	0.72		0.02	0.68	0.50
Ethnicity_asian		0.02	0.61	0.55		-0.01	-0.34	0.74		0.02	0.62	0.53		0.05	1.86	0.06
Education_gcse		0.06	1.53	0.13		-0.06	-1.48	0.14		-0.06	-1.64	0.10		-0.08	-2.43	0.02
Education_alevel		0.02	0.59	0.55		0.01	0.13	0.89		0.00	-0.04	0.97		-0.06	-1.72	0.09
Education_vocational		0.03	0.91	0.36		-0.04	-1.06	0.29		-0.04	-1.14	0.26		-0.06	-1.84	0.07
Education_undergrad		-0.01	-0.25	0.80		-0.05	-1.20	0.23		-0.07	-1.48	0.14		-0.09	-2.13	0.03
Education_postgrad		0.00	-0.06	0.95		-0.03	-0.73	0.47		-0.03	-0.75	0.45		-0.04	-1.14	0.26
Rurality_suburban		-0.01	-0.66	0.51		0.00	0.05	0.96		-0.01	-0.51	0.61		-0.03	-1.91	0.06
Rurality_rural		0.03	1.30	0.19		-0.02	-0.92	0.36		-0.04	-1.74	0.08		-0.05	-2.56	0.01
	2				2				2				2			
Condition_waste	(.05)	0.05	0.86	0.39	(.03)	0.03	0.48	0.63	(.04)	-0.07	-1.16	0.25	(.04)	0.02	0.33	0.75
Condition_British		-0.05	-0.89	0.38		0.04	0.68	0.50		-0.14	-2.30	0.02		0.01	0.19	0.85
Condition_Justice		-0.05	-0.90	0.37		0.10	1.63	0.10		0.00	-0.03	0.98		0.04	0.82	0.41
	3				3				3				3			
Pro-env. identity	(.45*)	-0.52	-29.30	0.00	(.39*)	0.51	27.53	0.00	(.39*)	0.53	28.16	0.00	(.51*)	0.63	37.60	0.00
Individualism		0.06	3.41	0.00		-0.16	-8.68	0.00		-0.14	-7.56	0.00		-0.12	-6.97	0.00
Hierarchism		0.21	10.74	0.00		-0.14	-6.78	0.00		-0.11	-5.34	0.00		-0.08	-4.02	0.00
	4				4				4				4			
Politics_conservative	(.46)	0.04	0.86	0.39	(.40*)	0.06	1.34	0.18	(.39)	0.10	2.06	0.04	(.51*)	0.08	1.79	0.07
Politics_labour		-0.01	-0.12	0.90		0.10	2.17	0.03		0.08	1.63	0.10		0.13	3.11	0.00
Politics_libdem		-0.04	-1.33	0.19		0.08	2.66	0.01		0.05	1.72	0.09		0.07	2.61	0.01
Politics_snp		-0.03	-1.04	0.30		0.07	2.47	0.01		0.08	2.70	0.01		0.05	1.87	0.06
Politics_ukip		0.01	0.40	0.69		-0.01	-0.18	0.86		0.04	1.16	0.25		0.04	1.29	0.20
Politics_green		-0.01	-0.27	0.78		0.03	1.35	0.18		0.03	1.36	0.17		0.06	2.70	0.01
	5				5				5				5 (.51)			
Political ideology (PI)	(.46)	0.07	2.04	0.04	(.40)	0.00	-0.03	0.97	(.39)	-0.06	-1.56	0.12		-0.03	-0.76	0.45
	6				6				6				6			
Waste x PI	(.46)	-0.06	-0.99	0.32	(.40)	-0.05	-0.78	0.44	(.39*)	0.09	1.40	0.16	(.51)	0.00	0.01	0.99
British x PI		0.05	0.90	0.37		-0.02	-0.33	0.75		0.18	2.84	0.01		0.02	0.28	0.78
Justice x PI		0.07	1.17	0.24		-0.09	-1.43	0.15		-0.03	-0.45	0.65		-0.03	-0.56	0.58

*F Change p<.001