Exploring views on climate change and how it should be addressed: What role is played by the discussion of mitigation strategies and the experience of extreme climatic conditions?

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Submitted for the degree of PhD in Psychology

University of Sussex

December 2016

Declaration:

I hereby declare that this thesis has not been and will not be, submitted in whole or in part to another University for the award of any other degree. This thesis is a presentation of my original research work. Independently, I designed, conducted, analysed and wrote up the research reported in this thesis. The work was completed under the guidance of my supervisor Dr Paul Sparks, who supported me in developing the design of each study and by checking my analyses and write-up.

Signature: ……………………………………

UNIVERSITY OF SUSSEX

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DOCTOR OF PHILOSOPHY

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SUMMARY

Some sociologists have suggested that focusing on individual behaviour change to reduce emissions detracts attention from larger structural issues. The first part of this thesis draws on mixed methods (1 interview study and 3 experimental studies) to look at the relationship between views on individual and structural levels of climate change mitigation. Interviewees mostly suggested individual behaviour change as a means for addressing climate change. The subsequent experimental studies investigate to what extent support for structural level change is minimised by focusing attention on individual behaviour change, but no such evidence emerged. However, there are other unexpected outcomes: for example, participants judge recycling to be one of the most impactful behaviours, illustrating that people's judgements of effective climate change mitigation may need revising.

The second part of the thesis relates to suggestions that lack of personal experience of climate change partly explains people's inaction. Drawing on fieldwork consisting of 77 interviews conducted in California on people's experience of drought, I firstly explore how people experience the drought itself; such as what changes they note and how drought perceptions are influenced by location. Secondly, I discuss whether and why people tend to think that drought and climate change are related or not. Importantly, people mostly interpret the drought according to their pre-existing climate change beliefs, so that if they already believed climate change was happening then the drought is treated as further evidence, whereas those who were sceptical of climate change usually see the drought as part of a natural cycle. In conjunction these studies expand the existing literature on views towards climate change mitigation and the role that personal experience plays in understandings of climate change.

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Acknowledgements

There are so many people who helped me through the process of this PhD that I do not know where to begin. The acknowledgements highlight to me the extent to which this research and writing has been a collective process, enabled by others' ideas, inspiration, affection and input. I am glad I have the chance to thank those who supported me through the peaks and troughs of the last few years.

First and foremost I would like to thank Paul Sparks, my supervisor, without whom this thesis simply would not exist. Paul, you proposed the idea of a PhD on perceptions of climate change and helped me obtain the funding. You replied quicker to my e-mails and queries than I replied to yours. Supervision constituted a relaxed and stimulating conversation. I really appreciated your relentless guidance through the 'silliest' questions, which I was not afraid to ask - thanks to your openness. You helped me not to take myself or work too seriously and to take a break when it was needed. Thank you for encouraging me to remain critical and enabling me to pursue the line of research that I wanted to undertake.

I would also like to thank David Ockwell, my second supervisor, for being there when I needed additional support and for taking my research beyond the realm of Psychology. You not only enabled my participation in research in Kenya during my Master's degree, which was an invaluable experience, but also rebuilt my confidence when I had doubts in myself - you did not shy away from praise.

Thank you to my family, Christine, Hanno, Jan, Werner, Lise, Inge, Chansopha, Martin, Fiona, Adam, Matteo, Emma, Nikki, Thomas, Melissa, Michael, Walti, Dirk, Annet, Kai Kai and Tommy for just being there.

Thank you to my friends, housemates and second family, Milly, Maria, Ellen, Adam, Alon, Nad, Robyn, Bambi, Susie, Hannah, Elsie, Lyndsay, Gabby, Lucy, Cat, Alec, Andrew and Jessie for being by my side in the day-to-day over the course of the last years. You were a constant source of laughter, nourishment - not just through delicious meals - and shoulders to lean on.

Alex and Donna, thank you for being a safe refuge in difficult times, for providing a second home in Brighton, for musings on life and the universe, puns and laughter.

A huge amount of gratitude is owed to my friends near and far, Tine, Jana, Rodrigo, Cara, Layla, Frida, Lily, Hedi, Naja, Judith, Lindsey, Atte, Katrin, Luqman, Dane, Scarlett, Gabe, Lizzy, Antonia, Ineke, Lena, Sarita and Laura for many years of friendship and care.

I am grateful to my office mates and friends, Anne, Jenny, Heather, Ruth, James and Yasin for making the office work I never thought I would have, a more enjoyable experience. Thank you for helping me with random questions, providing cups of tea and general constant support. Corinna and Julian, thank you for joining me along the end of

my journey at Sussex and for many happy memories of picnics and sunsets on the beach.

My friends and academic support in Oregon; Kari Norgaard, Ellen, Lola, Mandy, Dan, Larissa, Julius, Patrick, Allison, Ben, James and Antonio, thank you for a new experience of academia, critical conversations and fun. Special thanks to Diego for continuing to be there for me despite an ocean between us.

I am grateful to Luke Martell for inspiring, challenging and supporting me. I would also like to thank Donna Jessop for taking my fear about the annual reviews and for valuable comments and feedback.

Thank you to Milly, Cecilia and Charlotte for helping me transcribe many hours of interviews and to Milly, Bea, Jenny, Maria and Christine for helping to proof read and edit my work.

Thank you Tom, for letting me pick your brain about capitalism and climate change.

I am particularly thankful to all my participants and to the people who helped me along the way during my fieldwork. You are too many to name, but know that I am grateful without end for you hosting me and for going out of your way to make my research possible!

Special thanks to Milly who took me under her wing when I was down and never failed to listen and make me laugh when I needed it most. I am eternally grateful!

Thank you mum, I can't put into words how much you have been there for me.

I would like to dedicate this thesis to my mum, my aunt Lizzie and my grandmother Lise, thank you for believing in me. Lizzie and Lise, I wish you could be here to share this with us, you remain in my thoughts and heart.

- Chapter 1 -

Introduction

"Global climate change, although not the only environmental problem, is one of the
most important environmental issues facing humanity. Short of systematic
transformation, global climate change may produce alterations in the atmosphere, which
could threaten the survival of many species, including humans." (Clark & York, 2005,
p. 397)

My concern about anthropogenic climate change (hereafter just climate change)
is not only rooted in the awe I feel for our natural environment, but also reflects my
understanding of how climate change will affect humanity. Climate change has no
borders, although it will affect countries and their inhabitants differently, nor has it been
caused equally by all humans (as some parts of the world have produced higher
greenhouse gas emissions than others). Per capita carbon emissions have historically
been higher in countries in the 'West'[1] (Clark, 2011), who have more recently
outsourced some emissions by relocating production to other countries (Goldenberg,
2014; Kanemoto, Moran, Lenzen & Geschke, 2014). Yet, Western countries have
predominantly reaped the benefits from these emissions, as well as benefits from other
past and present power relations and exploitation. Therefore, those who are already
marginalised and vulnerable, although they have contributed fewer emissions, will be
more exposed and less equipped to respond to the impacts of climate change (Byrne,
Martinez & Glover, 2002; Klein, 2014; Norgaard, 2011; Parks & Roberts, 2006;
Stoddart, Tindall & Greenfield, 2012). As Stoddart et al. (2012) summarised:

> While the wealthier nations of the global North bear the greatest historical
> responsibility for contributing to the problem, many of the poorest countries of
> the global South will likely be the most vulnerable to flooding, drought, food
> shortages, and other environmental risks. Discrepancies in climate change
> responsibility and vulnerability overlay historical relations of colonialism and
> exploitation between the global North and global South, adding to the
> difficulties of creating international environmental policy. (p. 43)

Further, issues of climate and environmental justice exist both at the international and
intranational scale and interact with, for example, race, gender and class (Bullard, 1993;

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[1] 'The West' or 'Western' being a term used as shorthand for a heterogeneous
amalgamation of places with further internal differences.

Byrne, Martinez & Glover, 2002; Godfrey, 2012; Sultana, 2014; Terry, 2009). An understanding of how some people in the West view climate change might ultimately contribute to shifting support in favour of mitigation and social change in a direction that involves actual reduction of emissions and greater climate justice.

Research in Psychology and other disciplines has investigated many aspects of people's beliefs and behaviours in relation to climate change. There have been surveys tracking the prevalence of certain beliefs concerning climate change, such as whether or not it is anthropogenic (Capstick, Whitmarsh, Poortinga, Pidgeon & Upham, 2014; Leiserowitz, Maibach, Roser-Renouf, Feinberg & Rosenthal, 2015). Whitmarsh (2009) also examined which actions participants took with the express intention of contributing towards climate change mitigation.

One of the most cited articles discussed seven psychological barriers to explain high emitters' inaction towards reducing emissions (Gifford, 2011). While the author clearly highlighted that there are structural barriers which must be removed, the psychological barriers were presented as if they could be addressed separately from structural barriers. The author noted that:

> However, for almost everyone who is *not* severely restricted by structural barriers, adopting more pro-environmental choices and behaviors is possible, but this adoption is not occurring to the extent necessary to stem the increasing flow of greenhouse gases and other environmental damage. (p. 290)

It could be argued that most people are likely to be severely restricted by structural barriers, since, for example, public transport within and between cities influences the whole population living in a given area. Further, Gifford (2011) did not explain what would constitute more pro-environmental behaviours and actions? What were the kind of behaviours that people were expected to, but did not, engage in? A clearer identification of these absent behaviours would allow for a closer examination of firstly why in each case the behaviour might be absent, secondly it would allow to examine how effective that behaviour would even be in reducing emissions and thirdly to explore to what extent behaviour may or may not be constrained by structural barriers.

Amongst one of the barriers Gifford (2011) listed 'limited cognition', including humans' ancient brains and therefore their preoccupation with immediate dangers and the present moment, which was contrasted to the issue of global climate change described as: "… slow, usually distant, and unrelated to the present welfare of ourselves

and our significant others" (p. 291). However, constructions of time and distance have also been argued to be influenced by culture (Norgaard, 2011) and are not inherently given by the evolution of our brains.

To my knowledge no psychological literature has looked in more detail (beyond quantitative survey measures) at what actions people think should be taken to mitigate climate change and at who is seen to be responsible for bringing about these changes and, at reasons as to why they are not happening. This is precisely what the first study reported in this thesis undertook. The examination of people's responses to open-ended interview questions aimed to reveal which mitigation strategies came to participants' minds, as well as how participants debated the obstacles faced by individuals, governments and corporations in mitigating climate change. This contributed to current literature by examining not only what actions people thought should be taken, but also what reasons people gave for these actions occurring or not occurring and how the individual (citizens) and structural (governments and corporations) levels of action were seen to interact.

The third chapter reports a second set of studies which investigated to what extent an emphasis on individual behaviour change to mitigate climate change might reduce attention and support for more structural level approaches to climate change mitigation.

Finally, in the last study (reported in chapters 4 and 5) the aim was to examine in more detail which factors influence people's perceptions of climate change when they experience an extreme climatic event that has been linked to climate change. This included examining, for example, to what extent distance was a key influence and inherent in people's perceptions of climate change.

In summary, this thesis aims to explore:

1. People's views on climate change mitigation strategies and how responsibility for mitigation is attributed across different levels of action
2. To what extent individual level mitigation approaches might attenuate support for structural level approaches
3. The experience of drought in California and how it relates to views on climate change

Societal context of climate change

The aim of the current research is to study views on climate change with regard to the social context in which those views exist. Hulme (2009) has emphasised that climate change is not a discrete 'problem' to be 'fixed', but an idea (despite physical properties) which is understood in various ways and implies different courses of action to people in different contexts. (Nonetheless, for lack of a better term, I also refer to climate change as an environmental issue or problem.) Hulme (2009) has argued that climate change is a social phenomenon, as much as a physical one:

> … as society has been increasingly confronted with the observable realities of climate change and heard of the dangers that scientists claim lie ahead, climate change has moved from being predominantly a physical phenomenon to being simultaneously a social phenomenon … As we have slowly, and at times reluctantly, realised that humanity has become an active agent in the reshaping of physical climates around the world, so our cultural, social, political and ethical practices are reinterpreting what climate change means. (p. xxv)

Not only are the reactions to climate change social in nature, but so is the production of emissions, since it depends on the way societies organise and produce. Norgaard (2017) has pointed out that although climate change is the result of high greenhouse gas emissions, it is necessary to question why these emissions are occurring in the first place: "For climate change in particular, we need to better understand the social side of why emissions are occurring" (p. 172).

By looking at how people discuss climate change, I am inevitably looking at how people have come to view climate change in a given historical period; in a certain cultural, political and economic context, one that many people refer to broadly as 'capitalism'. Although there are many ways of defining capitalism, I draw here on a definition by Kasser, Cohn, Kanner and Ryan (2007) who have demarcated the defining characteristics as involving private property owned by individuals and corporations (shareholders) to produce goods or services in the pursuit of growth and profit. The production and exchange of goods and services occurs in a market economy, involving labourers who, in exchange for their work, earn a wage which they can use to consume other goods and services. The authors outlined that one of the fundamental assumptions underlying capitalism is that the system works best, when everyone acts in their own self-interest, resulting in a system where the capitalist tries to minimise expenses, even

at the cost of low wages (and it could be added environmental damage). Kasser et al. (2007) summarized the basic premise of capitalism as being that:

> … members of society will be provided with the opportunity to get what they want (i.e., a profit, a wage, and/or a product) through competing with each other and pursuing their self-interests. Moreover, such competition is assumed to lead to the highest quality goods and services at the lowest price to the consumer, thus benefiting society as a whole. (p. 4)

Foster (2000) drawing on Marx, also described some of the defining features of capitalism as characterised by a society that is: "… alienated by the institution of private property and the accumulation of wealth as the driving force of industry" (p. 79). Capitalism has also been described as follows:

> Spurred on by competition and constant growth, capitalism is not capable of 'self-sufficiency'. It must be constantly renewed, replenished, but on a larger scale. It cannot be stationary, thus it is 'fundamentally unrestrainable' and cannot 'recognize boundaries', whether social or natural, regardless of 'how devastating the consequences'. (Clark & Foster, 2009, p. 314, referring to work by Mészáros, 1995)

This means that capitalism hinges on a particular extractive relationship between humans and the natural environment, as its existence depends on continued resource extraction:

> While the appropriation of resources from distant lands has taken place throughout human history, the origins and ongoing growth of capitalism are dependent upon further ecological exploitation and ecological unequal exchange. It takes different forms, depending upon historical context and the demands of economic production, but it continues to operate in order to funnel resources – land, raw materials, and/or labor – into the process of capital accumulation. (Clark & Foster, 2009, pp. 311-312)

Climate change is the result of, and is responded to, in the context of the currently existing form of capitalism, which has defined modes of production and interaction between humans with each other, as well as with the environment of which they are a part (Clark & York, 2005; Klein, 2014; Newell, 2012; Norgaard, 2011). Clark and York (2005) outlined the tie between accumulation of CO_2 in the atmosphere and the accumulation of capital by the economic elite. Owing to the logic of capital accumulation, the authors argued that refinements of capitalism would not repair the core issue and proposed that: "… the transcendence of the growth driven, capitalist system is necessary if ecological sustainability is to be obtained" (p. 397). However, the complexity and interrelatedness of structural factors means that no single social cause

for climate change can be pinpointed, which is expressed in Beck's (1992) statement about the difficulty of relating:

> … destructive effects to individual factors that can scarcely be isolated within the complex system of the industrial mode of production. The systemic interdependence of the highly specialized agents of modernization in business, agriculture, the law, and politics corresponds to the absence of isolable single causes and responsibilities. (p. 32)

Notably, capitalism does not just define how the economy is organised, but ultimately how we relate to ourselves, each other and our environment. For example, Harvey (2006) argued that: "For any system of thought to become hegemonic requires the articulation of fundamental concepts that become so deeply embedded in common-sense understandings that they become taken for granted and beyond question" (p. 146). Similarly, Kasser et al. (2007) examined the (largely detrimental) influence of capitalist goals on how people think and behave, stating that capitalism:

> … carries with it certain practices and beliefs that foster the pursuit of self-interest, competition, economic growth, and high levels of consumption. As such, ACC [American corporate capitalism] is more than just money and goods—it is a system of beliefs, social relationships, and institutions that encourage, regulate, and direct human motivations and values …" (p. 6)

Kasser et al. (2007) note that given the inescapability of capitalism in contemporary culture, its influence has been acknowledged and studied relatively little in psychology. They suggested that given the pervasive nature of capitalism it could be expected that there would be substantial research on:

> … the psychology of the capitalistic economic system and the psychological and social consequences of living under it. However, a PsychInfo search using the term 'capitalis*' (to capture 'capitalistic' and 'capitalism') yielded only 816 articles in peer-reviewed journals published between 1887 and May 6, 2006. (p. 2)

The authors suggested that because these findings included articles from anthropology and sociology the actual figure would be lower if it comprised only literature in psychology. Similarly, the only time capitalist culture is mentioned in the American Psychological Association task force report on climate change (Swim et al., 2009) (using the search term "capitalis") is in discussing precisely the Kasser et al. (2007) paper mentioned above. The reference to capitalist culture is presented only in relation to its influence on consumerism, which ignores the many facets in which capitalism influences behaviour outside of consumption, such as in the way in which it defines

productivity, work, education and social relations as well as recreation and fun (Fincham, 2016). For example, Fincham (2016) argued that leisure has been influenced by and capitalised on as another market for selling activities and products:

> … the relationship between leisure, culture and consumption gives clues as a hegemonic construct of fun through capitalist provision of leisure spaces/activities and the development of leisure industries. Whilst not directly addressing fun they, nonetheless, often called upon fun as the motivation for the consumption of particular leisure activities and/or products. (p. 7)

Moreover, Fincham (2016) outlined how conceptions of fun and the right time for fun have been defined by a capitalist-driven interest in productivity, which in turn influences the organisation of education and work spaces:

> … manufactured fun is an attempt to control social interactions within environments where adherence to rules and control are privileged or important. When it comes to school and work the control of fun and a relationship to productivity is clear. The necessity to inculcate a population with the idea that fun is important but only in the right time and place becomes apparent when data about experiences of work is examined. It is in the interests of employers that they control how employees use time. The idea that something as non-productive as fun might happen in productive time is the antithesis of the logic of capitalist employment practice, and school is where we compartmentalise fun into the routines that then are reflected in work. (p. 202)

Even where the influence of capitalism is not the focus of a given investigation, its existence could at least be acknowledged and taken into account as the context (as is the case in the above quotes, where the topic of interest was the study of fun). This absence of acknowledging the importance of the socio-economic context is illustrated for example by a research paper which investigated reactions to models of potential consequences of climate change in focus groups in Switzerland (Stoll-Kleemann, O'Riordan & Jaeger, 2001). One participant in the focus groups highlighted the significance of the economic system in contributing to environmental damage:

> To say in short, you can't do that much as long as the economy continues to be so powerful. As long as economic interests are still so predominant. Before being able effectively to face environmental problems you would hence have to ecologize the economy first. (pp. 114-115)

However, rather than treating this as a relevant criticism of the economic system and examining what it would mean to the participant to act on such structural barriers, the authors simply interpreted it as another example of denial of one's individual responsibility: "The denials described above are therapeutic strategies to deal with the

pain involved in dissonance" (p. 115). Acknowledging capitalism as a defining force of current infrastructure, politics and daily life could influence, shape and change the analysis and interpretation of research findings.

One large gap in the psychological literature therefore seems to be that capitalism as the overarching structural context for people's views and behaviours has been largely ignored. This means that there is little psychological literature which I can cite and use as a guide to embed my research in a psychological understanding of climate change views in the context of capitalism. This thesis, although not primarily examining the influence of capitalism on perceptions of climate change, does take capitalism into account by presenting it as the context of the research. Although I do not consistently relate all perceptions and attitudes that are under investigation back to capitalism, I am presenting the above definitions of capitalism as the context in which my research was conducted and as *a basis for the analysis and understanding of my findings*. For example, I examine people's perceptions of corporations' profit motives which are a key characteristic of capitalism and were discussed in relation to responsibility for climate change mitigation.

Definitions of nature

In studying perceptions of climate change and views on mitigation, I look at people's constructions of the natural and social environment. Ingold (2000) argued that in Western societies, nature and culture are typically constructed as a dualism: "… the basic contrast between physical substance and conceptual form, of which the dichotomy between nature and culture is one expression, is deeply embedded within the tradition of Western thought" (p. 41). This stands in contrast to other ways of conceptualising this relationship where nature and culture are seen as inextricably entwined. For example, Watt-Cloutier (a former international chair of the Inuit Circumpolar Council interviewed by Callison, 2014) stated: "I think that some people have not fully come to understand that there is no disconnect between the suicide rates in our communities and climate change … Environmental issues—it's all connected" (p. 49). In line with this view, Ingold (2000) argued that humans and society are not separate from nature: "There can, then, be no radical break between social and ecological relations; rather, the former constitute a *subset* of the latter" (p. 60). The author proposed that a first step to the endeavour of ecological anthropology (and the same point could be made for any

other discipline that studies humans in their environment) is to recognise that: "… the relations with which it deals, between human beings and their environments, are not confined to a domain of 'nature', separate from, and given independently of, the domain in which they lead their lives as persons" (p. 60). I attempt to examine how discussions of nature and culture manifest themselves in Western societies, such as the UK and the USA, in line with Ingold's (2000) proposition that: "… we need to think again about our *own* ways of comprehending human action, perception and cognition, and indeed about our very understanding of the environment and of our relations and responsibilities towards it" (p. 40).

Definitions of risk

Like definitions of nature, the role of definitions of risk is also important. Beck (1992) argued that debates concerning the destruction of nature were being predominantly conducted in terms of natural science, while the social, cultural and political meaning that was inherent in scientific definitions, including definitions of risk, remained unrecognised. His critique highlighted that risk and environmental destruction is mediated by social definitions and values, i.e. not purely an issue of natural sciences or neutral and objective scientific study in terms of biological or chemical components. For example, social values will come into play when evaluating questions such as: "Where and how does one draw the line between *still* acceptable and *no longer* acceptable exposures?" (Beck, 1992, p. 29), answers to which are not inherently given by the natural sciences. In the case of climate change this is illustrated, for example, by the 2° Celsius set as the limit for 'acceptable' levels of global warming (Anderson & Bows, 2011). Climate change mitigation and adaptation also involve the negotiation of questions such as: "Should the possibility of an ecological catastrophe be accepted, for example, in order to satisfy economic interests?" (Beck, 1992, p. 29). Thus, although climate change is the result of chemical, physical and biological factors, these processes were set in motion by a particular socially-based relationship with nature. The social definition (which understands humans as separate from nature) and relationship (e.g., nature as a resource to be exploited) creates environmental destruction, but also represents the context in which it is addressed.

Structure and agency

If one regards capitalism and the industrial mode of production as causes of environmental destruction, however, then where does responsibility for climate change mitigation lie, and where can change occur? Beck (1992) problematized the concept of system as follows:

> … there is a general complicity, and the complicity is matched by a general lack of responsibility. Everyone is cause *and* effect, and thus *non*-cause. The causes dribble away into a general amalgam of agents and conditions, reactions and counter-reactions, which brings social certainty and popularity to the concept of system. (p. 33)

With climate change mitigation, as with many other environmental issues, there are questions related to structure and agency. My stance – underlying this research – is that structure and agency fluidly reproduce each other whereby structures create and restrain agency, but agency nonetheless exists to an extent, and again forms the larger structure, so that structure and agency are not separable as two ends of a dichotomy. This may be considered in line with the approach taken in structuration theory, where: "… it is fully recognised that individuals are at the same time constrained by, and co-creators of, societal infrastructure, and that social institutions are reproduced through the daily actions of individuals" (Giddens, 1984, cited in Seyfang, 2009, p. 9). However, rather than delving into this debate, my interest lies in looking at how certain structures of social organisation produce and constrain forms of agency, such as ways of thinking, perceiving and acting, and how the structural influences express themselves and are experienced at the individual and psychological level, which in turn directs the reproduction of the larger structure. This relationship between agency and structure relates to my focus on asking people about their views on different levels of action on climate change mitigation and responsibility.

Individual behaviour change approach and its criticism

Individual behaviour change approaches are those which focus on inducing people to change their lifestyle and consumption individually in their homes, at work and in terms of transportation. Examples of such behaviours include recycling, driving less and buying 'green' energy-efficient appliances and products (e.g., Department for Environment, Food and Rural Affairs, Defra, 2008; Environmental Protection Agency, EPA, 2016). A range of criticism has been raised over this approach. The criticisms are not about suggesting that people can or should continue consuming to excess, but rather

that other more structural mitigation approaches are being obscured (Kent, 2009; Shove, 2010; Webb, 2012). This is because the individualised approach locates the cause and solution to environmental problems in the individual. It rests on a certain conceptualisation of the individual as a rational decision maker and consumer with the underlying assumption and implication being that climate change mitigation hinges on individual people's choices: "The popularity of the … framework is an indication of the extent to which responsibility for responding to climate change is thought to lie with individuals whose behavioural choices will make the difference" (Shove, 2010, p. 1274).

Several sociologists have problematized this approach arguing that the approach is unlikely to deliver the required emission reductions, while obscuring government responsibility, the role of economic structures and modes of production, and distracting from other mitigation approaches (Brulle, 2010; Kent, 2009; Maniates, 2001; Norgaard, 2011, 2017; Shove, 2010; Webb, 2012). Further, the individualised approach to climate change mitigation is indicative of the current time period and economic structure: "Neoliberalism has generated rationalist models of individual responsibility towards environmental problems which rely on freedom of choice and freewill and encouraged through consumerism" (Kent, 2009, p. 146). Individualised approaches are not neutral, but political, precisely because they *hide* the extent to which governments are involved in sustaining unsustainable institutions, economics and lifestyles, and the degree to which they influence and constrain options and possibilities (Shove, 2010).

The individualised approach directs attention towards certain kinds of climate change mitigation strategies (e.g., recycling), while distracting from others, or in Shove's (2010) words, it deters people: "… from opting for other, less desired, courses of action" (p. 1280). The extent and power of the social organisation of attention and silence around undiscussable topics (or 'solutions') was examined by Zerubavel (2006). In the case of individual behaviour change approaches, the prime example of 'the elephant in the room' are structural factors, shaped by capitalism and under which growth, profit and consumption are required. The public is not stimulated to imagine and formulate a large scale social transformation, as the individual approach: "… does not contain within it the terms and concepts required to discuss or debate significant societal transformation" (Shove, 2010, p. 1277). For example, outlining the marginalisation of other approaches, Webb (2012) stated that:

> In adopting an individualized consumer model of citizenship, government strategy simultaneously obscures or marginalizes societal analyses, and obstructs acknowledgement of the contradictions between neo-liberal political economy and sustainable society. Short-term, instrumental economic values thus dominate climate change debate, to the extent that other systems of value are downgraded. The result is a perspective which is unable to identify effective routes towards a sustainable way of life. (p. 121 - 122)

So, not only is the role of structural factors in reproducing high-emissions downgraded, but other approaches to mitigating climate change are thereby neglected. In this vein, Brulle (2010) argued that the individualised approach atomises people and reproduces collective passivity: "Citizens are called upon to take individual—not collective—actions; thus encouraging a passive civil society" (p. 90).

To provide one example of a significant contributor to emissions which people are distracted from thinking about (i.e. where attention could, but is not directed to) is the US military. Sanders (2009) contrasted the way in which people are encouraged to consider individual behaviour changes, but not large scale polluters such as the US military:

> Over the years, my family has bought three or four little books on how to lead the greenest life possible… While they may pale these days considering the enormity of the environmental crisis, we nonetheless still take the advice to heart, choosing low-energy light bulbs … Every little bit helps, as the experts tell us, and, besides, we need to feel that we are doing something. But no list in any of those books addresses the largest single source of pollution in this country and in the world: the United States military … (p. 21)

The military is a large-scale polluter whose emissions are rarely discussed, let alone subjected to cuts (Sanders, 2009). Sanders (2014) drew an analogy comparing the US military to a daily occurring worst case BP oil spill, equivalent to releasing 1 million barrels into the environment every day. This stands in contrast to individual behaviour change messages, which imply that as long as behaviour changes occur, the surroundings can remain the same: "The extent to which these suggestions reinforce the status quo—broadly sustaining existing standards and conventions but doing so more efficiently—is partly but not simply a matter of politics …" (Shove, 2010, p. 1277).

Further, Maniates (2001) maintained that people will become disillusioned with the individualised approach, as they increasingly realise the approach does not work and that environmental problems continue to get worse:

> It's more than coincidental that as our collective perception of environmental problems has become more global, our prevailing way of framing environmental problem-solving has become more individualized. In the end, individualizing responsibility does not work—you can't plant a tree to save the world—and as citizens and consumers slowly come to discover this fact their cynicism about social change will only grow: 'you mean after fifteen years of washing out these crummy jars and recycling them, environmental problems are still getting worse—geesh, what's the use?'. (p. 44)

My intention in the research reported in this thesis has been to investigate how larger societal approaches and discourses (such as individual behaviour change approaches and the discourse of growth and profit related to capitalism) manifest in ideas for mitigation strategies, as well as how they influence attention to and support for structural level changes. Specifically, I looked at what role people see for themselves and those around them (friends and family) and for government and corporations in climate change mitigation. Views on the relationship between the individual and structural level were investigated and are detailed in chapter 2. I also examined how one of the dominant approaches to mitigation, which focuses on encouraging individual level 'pro-environmental' behaviour change, might reduce support for structural level change (see chapter 3).

The experience of drought and views on climate change

While the above critiques relate to the processes influencing views on mitigation strategies, in the following paragraphs I outline the rationale for the second part of my research, which examined people's perceptions of environmental change. Here, the focus was on how climate change has come to be understood in the context of extreme climate conditions (see also Callison, 2014; Norgaard, 2011).

One of the reasons sometimes given by both lay people and academics for Western people's inaction on climate change, is that the consequences of climate change are intangible, distant and gradual, and hence fail to provoke understanding, alarm and action (for a version of this argument see for example Giddens, 2011; Moser, 2010; Weber & Stern, 2011). However, people do care and act to a certain extent, even if climate change does not affect them (Isenhour, 2013). Additionally, several places and people are already being affected by climate change in both poorer and wealthier countries (Callison, 2014; IPCC, 2012, 2014). I draw on the recent California drought as an example of the latter. The drought poses a case study of people in a Western,

industrialised country, who are used to living in a culture of abundance, being confronted to some extent with 'natural' boundaries. This touches upon questions of how certain people respond in the face of environmental change and how the relationship between people and their environment is mediated by social and structural factors. For the planning of and research in California, I was guided by Norgaard's (2011) work in a town in Norway, where she looked into how people were responding (or not) to climate change. She contextualised her research by relating people's responses to cultural practices, norms and values as well as Norway's economic benefits from oil. Based on a similar approach, the latter part of the current thesis is more focused on people's perception of climate change as a basis for understanding how this may or may not influence action. Questions addressed were how people perceived changes (or not), how people linked them to climate change (or not), and how social factors enabled certain perceptions and not others (see also Callison, 2014; Norgaard, 2011). The aim of the second part of the thesis was to examine people's perceptions of drought and climate change in California.

One way in which the research in relation to individual behaviour change approaches connects to the later research on the experience of climate change, is that they are both concerned with social processes of selective attention and meaning making (Zerubavel, 2006). For example, Norgaard (2006) noted the lack of attention given to climate change in the absence of discussions and response to climate change in a town in Norway:

> It did not appear to be a common topic of either political or private conversation. How did people manage to outwardly ignore such significant risks? Why did such seemingly serious problems draw so little response? … Despite the extreme seriousness of global warming, the pattern of meager public response in the way of social movement activity, behavioral changes, or public pressure on governments exists worldwide. (p. 373)

Sampling

When I write about 'people' or 'the public' these are very generalising terms. What I mean is that I recruited members of the general public, such as students, rather than focusing on people who engage with climate change specifically (e.g., in their work or as activists) or people who have particular political and economic power. Further, I aimed to study people with a similar social status as myself to decrease the power imbalance between me as the researcher and those who 'participate'. The aim

was to examine the practices that were taken for granted and normalised in my own 'society' or similar Western societies. Additionally, as mentioned above, it can be argued that people in Western countries have more responsibility to reduce emissions because of their countries' histories of colonisation and higher per capita carbon emissions. As a consequence, people living there also have more time, resources and power to reduce emissions.

The people who constitute my sample (and whom I am referring to when I discuss 'people', 'participants' or 'the public') consist of students at my University in the south-east of England and of a convenience sample of Californians. This was because of my aforementioned interest in studying this particular subsection of society and for ease of access. Of interest were both idiosyncrasies and similarities between people which indicate larger patterns and divergences (hence the use of qualitative and quantitative methods).

Methodology

I studied questions of interest using the tools that I had available and that seemed most conducive to understanding what I was looking at, which resulted in a mixture of methods. Interviews and observations were a way of tapping into a more natural setting of how climate change was talked about in society: "By paying attention to conversation norms, we can begin to see the contours of social structure in private life and the links between political economy and interpersonal interaction" (Norgaard, 2011, p. 98). Interviews reveal in more depth the reasoning, the arguments, the feelings, the thought process and the negotiation that people engage in when conceptualising climate change. Crucially, qualitative methods also allow for the study of omissions (what is not present, what is not being said) and how discourse and omissions fit into the bigger picture. That is, with qualitative methods there tends to be an emphasis on taking into account the role of the context, a lack of which is one of the criticisms of experimental methods: "Within experimental psychology, the separation of the person from the natural context is so complete that no recent theorist has argued for the necessity of this separation; this issue is simply not addressed" (Kidner, 2001, p. 96). In contrast however, I also used quantitative methods, because they allow the researcher to focus on one particular question and isolate specific factors of influence on opinions and

to establish statistical significance (which is a commonly used tool in the research literature).

Research approach

In this research I do not claim objectivity or neutrality. My research is grounded in my direct experience of the world and interaction with the research participants. For example in my first study, I chose to use semi-structured interviews to gain a somewhat more personal exchange with my participants, seeking a deeper understanding of their perspectives and reasoning. The analysis is my interpretation of responses that I received from fellow humans to specific questions which I posed in the contexts in which we both exist (Ferrell, 2009). In conducting this research I have also been aware of the power relations that exist between 'the researcher' and the participants. For example, I decided on the research topic, research questions and interview questions, and I analysed and interpreted the participants' responses without their further input.

Overview of chapters

In the following chapters I present my research examining some of the processes and influences on people's views on climate change mitigation and people's interpretation of climate change during drought. The first study was an interview study with 20 participants (mostly university students in the south-east of England) to investigate what they think should be done to mitigate climate change. Specifically, they were asked about their views on what individuals such as themselves and their friends and family should be doing, as well as on the role of the UK government and corporations. These questions necessarily touched on beliefs about climate change and concern, or lack thereof and what difficulties people saw for climate change mitigation. Further, it contributed towards revealing what kind of awareness of mitigation strategies existed in the public, how mitigation was thought of and talked about, and how these strategies were related to the larger social, economic and political context. Hence, chapter 2 is an exploration of people's orientation towards different levels of climate change mitigation and responsibility of individuals, government and corporations. The themes that were extracted from the interviews examined, for example, the persisting doubt around human caused climate change, the relationship between different levels of intervention and discourse around choice and profit. This study will contribute to the

existing literature by exploring which mitigation strategies participants are aware of, what they think should be done and who they think is responsible for bringing about such changes. Additionally, the qualitative nature of the study means that participants will be able to express their views using their own words and are not constrained by the answers provided, such as is the case in survey or experimental studies. To my knowledge no such interview study examining what students think should be done to mitigate climate change and who should do it, has been conducted in the UK. Exploring views on possibilities and responsibility for climate change mitigation in the public is important in order to understand which mitigation approaches are prevalent in the public debate and which approaches might need further dissemination, as well as being able to inform which measures the public would be likely to support.

Chapter 3 reports three experimental studies that were designed in relation to the critiques of individual behaviour change approaches discussed above. In these studies participants were allocated to different conditions in which climate change mitigation on the individual level was presented either as favourable, ineffective, or was compared to the benefits of structural level change. Several outcome variables measured support for structural level change and structural level actors' responsibility to reduce emissions. Broadly, it was expected that positive presentation of individual behaviour change would detract support from structural level change. The studies reported in chapter 3 will contribute to the existing literature by applying sociological critiques of individualised approaches to climate change mitigation. To my knowledge the impact of individual behaviour change messages on support for structural level change to mitigate climate change has not yet been experimentally tested.

Chapters 4 and 5 draw on research conducted in drought-affected California in late 2015. This fieldwork was inspired by some of the responses obtained in the interviews with students (reported in chapter 2) who repeatedly pointed towards the need for people to '*really*' feel the effects of climate change, before behaviour would change. This idea was raised despite increased flooding in the UK, which occurred only a few weeks prior to the interviews. This notion was also echoed in some of the academic literature which explained climate change inaction at least partly, in terms of distant consequences of climate change (Giddens, 2011; Moser, 2010; Weber & Stern, 2011). Additionally, I was struck by the news coverage about Governor Brown's (the Governor of California) linking of the drought to climate change. This news coverage

was likely to have influenced public opinion and discourse. In contrast, it seemed to me (although I did not conduct any thorough review of this) that the news coverage of the floods in England rarely mentioned climate change. In California, reports were grave and mentioned mandatory water reductions. People in a Western industrialised country were being subjected to mandatory water cuts in relation to drought and climate change. I wanted to study how this was being experienced on the ground and to follow up the idea that people need to feel the effects of climate change before serious action is taken to actually reduce emissions. In chapter 3 I focus on how Californians experienced the drought itself, while in chapter 4 I look specifically at their experience of drought in relation to views on climate change.

The research in California contributes to existing literature by exploring how drought, which climate scientists have argued to be exacerbated by anthropogenic climate change, is experienced on the ground. The qualitative approach allowed a more open and in-depth exploration of participants' experiences and reasoning. Chapter 4 examined some of the factors that influenced participants' experiences of drought. To my knowledge there has not been a qualitative study examining the experience of drought in California or the USA more generally. Chapter 5 investigated the reasons participants gave for their views on why drought is linked or not to climate change. This research is important since an examination of how climate change is perceived in an industrialised country can inform an understanding of how people make sense of climate change locally and ultimately under what circumstances experiencing change might lead to action on mitigation. It is my aim that, in combination, these studies will add to the research on views of climate change in their societal context. This thesis examines the way in which some people have come to relate to climate change, and thereby may in the long run contribute towards an understanding of and change in perceptions and actions.

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- Chapter 2 -

Talking about climate change responsibility: Individual, governmental and corporate levels of action for mitigation

Abstract

This chapter investigates how climate change mitigation is discussed publicly by examining how people talk about different levels of intervention. In an interview study 20 people (mostly university students) were interviewed about what they think should be done to reduce the degree of climate change. Four main themes were discussed: the first relates to the acceptance of the reality and severity of climate change; the second touches on responsibility and suggested action; the third addresses opposing environmental and economic interests and the fourth examines views on protest and reasons for inertia. Overall there was support for a variety of climate change mitigation strategies. There was some emphasis on individual behaviour change combined with suggestions for more information and the importance of personal choice. Although some participants criticized economic and profit-oriented structures, there was a strong sense that change in this regard was unlikely. I conclude by suggesting that more examples of alternative strategies to address climate change need to be presented, firstly in order to go beyond individualised approaches, and secondly to make significant change seem more possible.

"I feel one of the crises that we're facing is a crisis of language. We are not speaking about [climate change] with the language of urgency or mortality that the issue deserves." (Naomi Klein, in an interview with Mark, 2013)

Owing to the increased greenhouse gas emissions from human activities climate change is affecting environmental and social systems (IPCC, 2014). Faced with increased natural catastrophes - sea level rise, destruction of eco-systems and other impacts which are occurring across the globe (IPCC, 2014) - the question of how to respond to climate change remains unanswered. Many suggestions exist as to why emissions are not successfully being reduced in order to mitigate climate change. These range from personal level explanations, for example, scepticism, inconvenience and habits, to structural analyses, for example, the 'denial industry' organised by fossil fuel lobbies, and the economic and political systems of capitalism which are based on continued fossil fuel extraction.

In this chapter I examine how ways of mitigating climate change are talked about by the public (based on a sample of students in the UK) in relation to individual, governmental and corporate levels of action. What roles and responsibilities do people assign to themselves and those around them, as well as to government and corporations?[2] What possibilities for mitigating climate change come to mind and which ones constitute 'unthinkable' ideas that are omitted? It can be argued that: "… climate change challenges our existing political and economic structures like no other prior problem" (Norgaard, 2011, p. 191), but to what extent is climate change perceived and discussed as such a pressing and system challenging issue among the general public?

Individualised responses to climate change

Individual behaviour changes include those that call on individuals to reduce their emissions, mostly through changes in lifestyle, such as driving less or recycling more. In contrast, structural-level changes could relate, for example, to changes in infrastructure such as transportation, or through regulation on emissions of polluting industries, or through cultural and economic shifts that lead to entirely different ways of

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[2] The individual and structural level are not separate but constitute and shape each other. However, they are often treated as separate in society, e.g., as if individuals could be persuaded to recycle more through increased information, irrespective of recycling infrastructure.

producing and consuming. The relatively dominant approach to reducing carbon emissions through individual behaviour change has been criticised for locating the responsibility for emissions and 'solutions' to mitigation at the individual level, while failing to address the political and economic structures and decisions which maintain high emissions and constrain individual behaviour (Brulle, 2010; Kent, 2009; Maniates, 2001; Norgaard, 2011, 2017; Shove, 2010; Webb, 2012). Brulle (2010), for example, criticised environmental communication approaches that are based exclusively on cognitive science and advertising techniques, because they:

> … lack any contextual basis within a larger theoretical structure of the role of communication in facilitating large-scale social change processes. This theoretical deficit leads to the development of climate messaging strategies that support short-term pragmatic actions that fit within economic and political imperatives, but fail to address meaningfully the ecological imperatives defined by global warming. (p. 83)

It is important to make explicit the conceptualisation of the individual that underlies this approach, as it influences the understanding and interpretation of people's behaviour. In some studies people's views on climate change mitigation and (in)action have been construed as forms of an individual's psychological denial, such as to avoid some sort of process of dissonance. For example, when interpreting their focus group's varied analyses on necessary steps to mitigate climate change, Stoll-Kleemann, O'Riordan and Jaeger (2001) stated that "The denials described above are therapeutic strategies to deal with the pain involved in dissonance" (p. 115). One participant had commented on economic structures:

> To say in short, you can't do that much as long as the economy continues to be so powerful. As long as economic interests are still so predominant. Before being able effectively to face environmental problems you would hence have to ecologize the economy first. (p. 114-115)

Although this could be interpreted as a displacement of responsibility (i.e. a form of denial of individual responsibility), it can also be treated as a relevant criticism of the economic system. Rather than brushing it off as denial, it may be worthwhile instead to ask what it would mean to this person to act upon such systemic criticism.

Thus, the focus on individual responsibility found in today's climate change mitigation strategies can be contextualised as arising from a certain neoliberal conceptualisation of the individual: "Drawn from the neoliberal, capitalist tradition, individual responsibility now resonates much more widely, becoming a familiar

catchcry of politicians, bureaucrats and NGOs, including environmental organizations" (Kent, 2009, p.137). Drawing on the way in which students understand and discuss climate change mitigation, the present study examines how this conceptualisation manifests and is expressed at the micro level.

While being called upon to take 'pro-environmental action' some people express feelings of helplessness, partly because they see individual behaviour change as ineffective. For example, Norgaard (2011) argued that: "… helplessness is the product of a situation where people perceive that neither individual actions nor existing political or economic structures are adequate" (p. 193). Citing the American Geophysical Union, the author suggested that public apathy is related to perceptions of whether anything can be done:

> … informing the public of the problems can increase frustration and apathy rather than build support. Our research suggests that what the public is most skeptical about is not the existence of problems but our ability to solve them. What will make the public invest energy in these issues is not the conviction that the problems are real, but that we can do something about them. (Immerwahr, 1999, cited in Norgaard, 2011, pp. 191-192)

In line with this suggestion, the present study investigated what some members of the public thought should be done to mitigate climate change.

Relationship between the individual and governmental level

A study by Butler and Pidgeon (2011) highlighted the relationship between different actors' perceived responsibility for climate change adaptation in the form of flood risk management in the UK. The authors conducted interviews and focus groups with professionals working in flood risk as well as with residents in three cities that experienced floods in 2007. They noted a shift in policy response from the previous approach, where the focus had been primarily on government's responsibility to keep the water out, towards an approach where individuals were supposed to take responsibility. For example, the authors described agencies' aim to shift the public's expectation and perception towards one where residents know about and accept the risk of floods (so that living with flood risk becomes the norm). In contrast, members of the public expected authorities to take responsibility, since they were seen to have the power to change structural development. Thus, different actors had varying ideas of

appropriate strategies and responsibility for climate change adaptation, and similar patterns may apply in the case of mitigation.

Corporations[3] and industry

Modern corporations' influence on social and economic processes has grown under globalization, neo-liberalism and industrialisation, as Banerjee (2008) formulated: "While the wealth creating ability of modern corporations is unquestionable, their social and environmental effects (and indeed some economic effects) are unquestionably damaging as well" (p. 54). Banerjee (2008) suggested that, although sometimes presented as a fundamental economic change, corporate language on sustainability supports the 'greener' version of business-as-usual. Further, the author argued that governments and organizations such as the United Nations also framed so-called sustainable development as a business matter, leading to an approach towards sustainability based on business terms and market value, rather than societal or ecological priorities. Nyberg and Wright (2012) examined discursive strategies employed by companies' sustainability managers in relation to their environmental sustainability agendas, which have developed in order to legitimise and counteract criticisms of corporations' otherwise socially and environmentally damaging activities. They found that their interviewees persistently referred to market value, justifying environmental projects as reactions to both business risks and opportunities presented by climate change and that responding to consumer alarm about climate change was seen as a crucial way of selling products and services. More general 'green' marketing of the company through affiliations with NGOs and environmental groups was often treated as creating a positive public image that would lead to enhanced sales and profits. Owing to corporations' significant social and environmental impact as well as their

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[3] The use of the term corporation in the present study is in line with Bakan's (2004) definition: "A key premise is that the corporation is an *institution*—a unique structure and set of imperatives that direct the actions of people within it. It is also a *legal* institution, one whose existence and capacity to operate depend upon the law. The corporation's legally defined mandate is to pursue, relentlessly and without exception, its own self-interest, regardless of the often harmful consequences it might cause to others … I use the word 'corporation' to describe the large Anglo-American publicly traded business corporation, as opposed to small incorporated businesses, or small and large not-for-profit or privately owned ones" (pp. 1-3).

green-marketing strategies, participants in the present interviews were asked about their views on corporations' and industry's role in climate change mitigation.

Views on climate change mitigation responsibility

Drawing on a large sample in Canada and employing open-ended qualitative methods, Stoddart, Tindall and Greenfield (2012) examined environmental group members' views on who should be most responsible for addressing climate change, concrete suggestions for mitigation, and the relationship between different actors. They found that the top four responses participants identified were government leadership (76.3%), then individuals as the driving force (39.4%), 'everyone' (28.4%) and corporate responsibility (21.6%). Government was seen as responsible because they have the power to legislate (such as obliging corporations to act more sustainably) and to enable or mandate individual behaviour change. At the same time respondents also indicated that individuals play an important role in putting pressure on governments to act. The authors noted widespread scepticism concerning corporations' willingness to safeguard the environment: "The discussion of responsibility is largely limited to two "levels" of social life: the nation-state and the microsocial" (p. 49). In contrast they found little mention of action at the community or international level.

Ipsos Mori surveys have examined and tracked public attitudes over time. In 2014, 88% of the people surveyed in Great Britain believed that the world's climate is changing, although concern decreased from 82% in 2005 to 68% in 2014. Importantly, in 2013, 64% agreed that 'the climate change we are currently seeing is largely the result of human activity' while 24% disagreed. Further, of the people surveyed prior to and during the climate change conference of the parties (COP 21) in Paris in 2015, 31% strongly agreed that the UK government should take a lead role in global action on climate change, while 46% agreed that the government should take actions necessary to tackle climate change 'only if it does not harm economic growth'. Seventy percent tended to agree or strongly agreed that companies should do more to decrease their impact on climate change. Notably, the environment (including climate change) consistently fell behind other issues that people thought were affecting Britain, which were ranked in the following order in 2015: immigration, NHS, economy, unemployment and the environment (Ipsos Mori, 2015). In 2008, 4% agreed that 'individuals should not be expected to do anything, it is not their responsibility' to

tackle climate change, while 47% agreed that individuals should engage in some actions like recycling more, driving and flying less (Ipsos Mori, 2008). These figures suggest that climate change is not a top priority for the public at large in Great Britain, but that there is some support for government, corporate and individual level action. Although these surveys provide some insight into the prevalence of each belief they say little about which reasons people give and how climate change mitigation is discussed more generally.

The present study

There is little qualitative research examining beliefs about climate change mitigation strategies. Therefore, similar to Stoddart et al. (2012) the present study uses qualitative methods to explore participants' interpretation and discursive elements concerning responsibility for climate change mitigation, in order to connect research on climate change beliefs and intervention. However, while Stoddart et al. (2012) exclusively examined the views of members of environmental groups, i.e. people who are more attentive to environmental topics, the present study draws on a largely student based sample with no particular affiliations to environmental groups in the south of England. Although students are not representative of the general public, interviews will reflect how some people who have access to university education view responsibility and strategies to tackle climate change.

In outlining dialectic linguistics, Steffensen (2007) argued that language is contingent on its context, such as the circumstances for its production, circulation and usage. According to Steffensen (2007), employing language as a research tool thus allows one to bridge the social realm with the psychological realm, as language presents both what people are willing and able to say about their thoughts, reasoning, emotions and actions, as well as reflecting societal discourse and current cultural values. Further, the author suggested that dialectical linguistics can be used to investigate the effect of language on social affairs and its part in the continuing ecological and social 'crises'.

In summary, this study examines what a sample of students think should be done to mitigate climate change.

Method

Participants

Twenty participants were recruited for interview through an e-mail to a University's Psychology participant database and through an online system for managing study participation. All participants who responded were invited to the interview until the recruitment limit of twenty participants was reached. Eighteen participants were undergraduate students studying a diverse range of subjects. Two participants were local residents who were on the Psychology database. Fourteen females and 6 males participated. Their age ranged from 18 to 37 years ($M = 22.45$, $SD = 5.16$). In return for their time and effort participants were paid £5.00.

Data generation

Two researchers conducted separate interviews (the author conducted 13; a research assistant conducted 7). A semi-structured interview plan with approximately seven open-ended exploratory questions was employed flexibly with additions, omissions or adaptations according to the responses obtained. The interview began with the question "What do you think should be done in order to reduce the degree of climate change, if anything?" Sometimes this question led to discussions regarding beliefs about climate change, such as whether or not it is occurring, anthropogenic and problematic, or otherwise to discussions about possible personal and political interventions. Additional questions concerned participants' views of their own role in reducing the degree of climate change, as well as that of other individuals, such as friends and family and that of government and corporations[4]. Finally, so that people would not feel constrained in their answers by the way things are now or by being 'realistic', participants were also asked what they would do to reduce climate change if they had all the decision making power. The interviewers engaged in a two-way dialogue with participants to follow up on comments and encourage clarification. Interviews lasted

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[4] Although it is difficult to separate different levels of action on climate change mitigation (e.g., personal/individual, governmental and corporate), I used these concepts as starting points for a discussion. I acknowledge that they can neither theoretically nor practically be separated, but as a reference point for my interviews and the analysis it was easier to discuss them separately.

between 10 and 30 minutes. All interviews were voice recorded with two Dictaphones. Interviews were transcribed verbatim (all words and some fillers [err, um] but no non-verbal communication was included).

Procedure

Interviews were run individually in a group study room in the University library. Upon arrival participants were welcomed, handed the information and consent forms and, if they agreed to continue, the recording of the interview began. Participants were informed that the interview would be similar to having a conversation although there were set questions. They were also told that there were no right or wrong answers as the researcher was interested in their opinions and it was also emphasised that participants could say if they did not have any opinions or ideas about a subject. At the end participants were thanked, paid and debriefed.

Analytic Approach

Thematic analysis - a method to examine, analyse and report patterns in data - was used to examine themes from the interviews (Braun & Clarke, 2006). I chose this method because it is flexible, comparatively simple and accessible for a first qualitative analysis, and compatible with different epistemological approaches (Braun & Clarke, 2006). In thematic analysis the researcher is emphasised as playing an active role, for example themes do not emerge from the data set but are selected, interpreted and presented based on active decisions made by the researcher (Taylor & Ussher, 2001). I used a constructionist approach to thematic analysis to explore how views, realities and meanings result from a range of discourses existing within society (Braun & Clarke, 2006). The study does not intend to make any generalizable claims about climate change beliefs, or to test any hypotheses; instead it aims to examine what these particular participants say should be done to reduce the degree of climate change and in particular what different actors should do.

Analytic Procedure

A theme captures something crucial in relation to the research question and ideally appears several times across the set of interviews (Braun & Clarke, 2006). It is the researcher's judgement to decide on what counts as a theme. After completing transcription I printed and read all transcripts. During each reading the transcripts were

coded with preliminary summaries, comments and interpretations, noting language use, implicit assumptions, contradictions and frequent topics. Passages were extracted and collated with similar statements. The research supervisor similarly read and coded the transcripts. In subsequent meetings themes were compared and discussed. Relevant passages were then extracted from all interviews according to the new list of themes. The labels for themes remained flexible during the analysis, as some overlapped and interlinked. Particularly compelling extracts were chosen for illustration of a theme in the final results.

Results

Four themes were extracted from the interviews and are illustrated in bold; subthemes within these are indented. Ellipses indicate where passages have been omitted. Brackets explain what the participant is referring to or indicate non-speech utterances. Hesitations, 'ums' and 'errs', and repetitions were removed from the final write-up. To ensure anonymity participants' names were changed.

Representations of climate change: Uncertainty about its reality and severity

Any discussion about what should be done about climate change inevitably touches upon people's opinions of whether climate change is happening and whether it is caused by humans. In some cases participants jumped straight into suggestions for addressing climate change, but some delved into questions about the reality and severity of anthropogenic climate change. These discussions highlight the importance of the understanding of climate change, such as to what extent it constitutes a problem, as well as identification of its causes, which in turn are linked to views on how to address it. I will outline some of the most common and striking ways in which the cause and urgency of climate change was questioned. Although most of these have been identified in previous research it is important to note that uncertainty, scepticism and confusion about climate change are still prevalent. The subthemes relate to perceptions of climate change as cyclical, natural and inevitable, and to climate change as a future problem.

Climate change as cyclical and natural. One common way in which some participants doubted the anthropogenic nature of climate change was by pointing towards the fact that climate has always changed and that climate change is natural and

cyclical as evidenced by previous ice ages. For example, Bea contrasted past changes with present changes and suggested that neither were caused by human activity.

> Bea: If you are talking about climate change as if in, like, the weather changing and things like that, I don't know if there is enough evidence to say that it is changing dramatically, 'cos there has been huge changes in our climate in the past which haven't had anything to do with what we are doing, like the ice ages and things like that and they weren't influenced by human activity, they were just natural occurrences.

Following a similar line of argument Ryan debated the extent to which humans have an impact on climate change. Ryan's line of reasoning combined the idea that climate change occurs naturally, with the acceptance that humans have some impact, while remaining sceptical of the extent of that impact. The extract illustrates the uncertainty some people feel, and how different discourses combine and are internally debated and negotiated.

> Ryan: Well the thing is, I don't really believe, I do actually, but I just don't believe in climate change that much. As in, I know it's happening, but I'm not a 100% sure it is human people who are, that is, the human race is responsible for the entire climate change … I do believe we should obviously, like, help the climate change. I mean, we are all one of the causes of climate change, carbon emissions, you know all that kind of thing, fuel footprint … Yeah so I think obviously it would be better for the environment. Carbon emissions are never good for the environment … It's hard because I do believe in climate change, I do believe we are a cause of it but I'm also not sure how, how bad of a cause we are. So not, not clear … But if it (emissions) doesn't have that much of a negative effect and if climate change damage is just going to repair itself as the earth does by itself most of the time, then maybe not (reducing emissions would not reduce the degree of climate change).

Notably Ryan turned from a debate on causes of climate change to one on the extent of human contribution. The final point Ryan made related to the notion of cycles of damage and repair and that the earth could repair itself, as it has done in the past. While the first and more prominent point in scepticism is the idea of natural climate variability and cycles, this notion was sometimes accompanied by a more general and abstract idea about cyclical patterns of damage and repair. It is a conceptualisation that presents climate change as inevitable and suggests that it is meant to be. Climate change and destruction become part of a higher natural order.

> Jasmine: Climate change is sort of inevitable but I think we can slow down the effects of it … obviously I am not a scientist … but from what I can gather … the earth kind of has this sort of cyclical thing, you know, where you have an ice age or whatever and then it kind of like evolves and all of that … and it kind of

like goes around in cycles like that … people destroy themselves and then they build themselves up again … I'm not sure if that's right but … It's tricky because I don't know if, you know, climate change has to happen, if the world has to kind of stop and then start again, I don't know if that is kind of how, you know, it is meant to work, or if we can just carry on doing what we are doing, but obviously if we carry on doing what we are doing then it's going to stop a lot sooner, if that makes sense (chuckles).

Climate change as a future problem. Rather than questioning whether or not climate change is occurring or caused by humans, some participants did not experience it as urgent, because they saw it as a future problem. This stance indicates that even where there was an awareness of the potential damage caused by climate change, the understanding did not necessarily translate into high levels of concern or urgency, because the damage was seen as 'only' affecting people in the future. Alexander's and Martin's statements are noteworthy because, although agreeing on a need for action, by referring to climate change as a future threat, they simultaneously downgrade the urgency to act.

Alexander: I am not sort of overly "oh climate change is a massive deal" kind of thing but probably better to do something about it now before it gets too late … I don't think like it is a huge problem now but it will be in hundreds of years' time, so it is better to get on top of it early.

Martin: Well it depends on where you look, like, for us it is not really a problem, because obviously we are going to be dead before the, like, the earth actually feels the real ramifications of what we are actually doing, but I mean in like one hundred or two hundred years there will be so many, like London will be under water.

In summary, the above examples illustrate some scepticism about the anthropogenic causes and current urgency of climate change. Although the responses presented are not new in the research literature, they are noteworthy because they highlight that the debate about the anthropogenic nature and level of urgency of climate change is still present. Further, it is relevant to outline some of the ongoing scepticism and uncertainty to demonstrate the context in which approaches to addressing climate change are sought.

Responsibility and action on different levels

In this section I present the actual suggestions for climate change mitigation that participants put forward for actors on different levels. The first three subthemes relate to actions which participants identified for each level (individual, governmental and

corporate). These subthemes are a direct result of the interview questions. The other subthemes relate to the relationship between different levels and the imperative of personal choice and the need for more information.

Individual level. The interviews started with the very broad question of, "What do you think should be done in order to reduce the degree of climate change, if anything?". Particularly noticeable was that one of the most common approaches mentioned in response was at the individual level, such as suggesting more recycling.

> Bea: There is a lot of things that could be done, making the planet more sustainable, like eventually we will run out of resources, so we need to recycle or reuse a lot more.

Other popular suggestions related to changes in transport behaviour such as driving less, car sharing, cycling and using more public transport.

> Alexander: Probably encourage people to drive their cars less, would be my main point, I'd say. Cycle more, and it's healthy lifestyle as well isn't it, as well as reducing climate change.

Even participants who were not convinced of climate change happening were supportive of these actions because they saw them as good for saving resources, reducing pollution more generally and improving health. Other suggestions for individual behaviour change involved the reduced usage of electricity (for example by turning off appliances) or switching to renewable energy providers, changing food habits, and sometimes flying less.

> Laurence: I mean on a personal level things like turning off lights, and you know, only boiling enough water that you are actually going to use, recycling, things like that, trying to maybe grow your own food and sort of cut down on air miles and stuff … not driving so much where you can walk, my parents and my sister are really into driving anywhere and everywhere, they drive to the gym, what's the bloody point in that? You know what I mean, it is ridiculous.

> Underlying suggestions for individual behaviour change was the sense that

'little' changes add up to make a bigger difference and are therefore worthwhile.

> Danielle: Well, I suppose small things, like, I don't know, recycling, and maybe cycling instead of using a car, things like that. Which all kind of adds up, to reduce your carbon footprint and stuff like that.

Similarly Izzy suggested that there would only be some sort of impact from individual actions if several people started to engage. Notably, she also mentioned the different level of responsibility of individuals across countries, taking into account per capita

emissions. Izzy's remark on differentiated responsibility was not commonly mentioned and illustrates an approach that not many participants seemed to be aware of.

> Izzy: I think when it comes to individual actions, if I just do it on my own then obviously that's not enough, but then if people get educated and they start to change, and each one changes a little bit, it certainly will have an, some sort of impact, especially the ones like us who live in the West, because when it comes to the carbon footprint we kind of have, like even, I think even if China produce like more of CO_2 in a massive country, but then if you divide it per capita then it is still much lower than the CO_2 per capita of us in the West, so definitely if we try to, if everyone just put a little bit of effort into reducing energy consumption then it will make a difference.

Governmental level. The UK government was largely viewed as having some responsibility to address climate change, as people in authority were seen to hold more power to act than individuals.

> Martin: I think it's the role of government to make the big changes, not just the personal changes, they're the ones that should be enacting stricter regulations on things, and they do do that to an extent, but obviously it is not working enough.

Participants also tended to view the government's role as that of enabling individual behaviour change, such as creating adequate infrastructure.

> Jasmine: I am not really sure, maybe kind of encouraging people to kind of take public transport more, maybe improving the public transport networks and things like that, to kind of encourage people to do it more.

> Laurence: They (government) should make it easier, somehow, I don't quite know how, they should make it easier for people, they should encourage people to change their habits.

The government was also seen as responsible for raising awareness through providing more information, campaigns and education, so that people act more pro-environmentally (see the later section on the need for more information and education).

> Bea: They (the government) should be giving a lot more information about it (climate change) to people. And making it easier for people to do their bit, like recycling and stuff, just like telling people what they need to know, it's like recycling in our area, I find it really hard to know what can be recycled, what can't be, 'cos there is not the information there to let us know.

> Izzy: I think, well, the government could have something implanted in like the national curriculum just, you know, on the citizenship part, that they make sure they teach something about climate change and that they give, you know, the most up to date and accurate information.

Several participants were in favour of increased government regulation and taxing of corporations.

> Gwendolyn: Maybe to curtail business, I think now I am more in favour of a state that if it can have a (role to) supress (stop) businesses, (from) just like destroying the complete planet basically.

> Laurence: Well not sure, if passing laws, banning it, you know, taxing energy companies to the hilt, I can't see, you know, hitting them where it really hurts, I can't see any other way around it. I mean you can always make laws banning that, but laws can be circumnavigated as well quite easily.

The government was also viewed as responsible for investing in renewable energy, but participants were critical over the influence of companies and profits.

> Laurence: Governments could do a hell of a lot more, they are all, well it is very sort of, they are geared towards making trade deals and profits and it is all about the economy, to the expense of the environment … I mean, more investment needs to be put into renewable energy and stuff but governments seem, you know, they are so beholden to oil companies and to energy companies and they need to not be. I am not quite sure how that is achievable but, you know, they need to make the switch from fossil fuels to renewable energy basically.

> Elena: Well, first of all I think we should exploit the earth resources, like the energy from the sun, I don't exactly know how to say it in English, but the energy from the sun and the wind, from the water as well, the ocean, I guess it has a lot of potential that we are just avoiding, because it is not, governments just don't want to exploit that kind of resources, because it is not in their biggest interest, like oil and all that kind of energies that we are using nowadays.

In summary, government was seen as having a responsibility to intervene in order to ensure reduction of emissions and waste of natural resources. Participants suggested that the government should provide the infrastructure to make pro-environmental behaviour change more practical for the public, raise awareness through increased information and restrict companies in their environmental damage, as well as investing in renewable energy to enable a shift away from fossil fuels. However, respondents also saw government as colluding with corporations and pursuing mainly economic interests.

Corporate, business and industrial level. Corporations were perceived as holding a lot of responsibility, because they emit a lot of pollution and waste, and because they have more power.

> Jasmine: Well, I think they (businesses) probably, if we want to have real change it probably should start there. Because business leaders and, you know,

that kind of thing they have the actual, sort of, it is sad to say, but they have the power, and they have the influence to kind of change things.

The concrete suggestions that participants put forward for corporations to change ranged from more abstract normative suggestions, such as being less greedy, to stating that they ought to somehow cut emissions (but often not mentioning how this would be achieved). Many participants proposed that corporations and industry could use more renewable energy.

Tina: Well, (laughs), they (corporations) are the main energy users I guess, because of all the factories and stuff, so I guess they need to look at newer ways of getting energy that like are more environmentally friendly and they need to use it more than us, because they are using more energy than us, I guess.

Some participants mentioned that corporations should recycle more, which is noteworthy because it may be that people are transferring ideas from what can be done on the individual level to the corporate level, instead of suggesting a more fundamental change to how corporations and industries function and produce.

Charlotte: I used to be an intern in one of the companies in Pakistan and we had just started recycling, it was just something that we had to do. I mean we had to actually propose it to them, I know I am emphasising a lot on that (recycling), but it is such a basic thing that if you do it, (it) helps a lot, we have no idea how much it helps. So, I think corporations need to, as a take down from, you know, the authorities carry on with recycling and help their people recycle as much as they can.

Corporations and business leaders were sometimes not viewed very favourably.

Gwendolyn: I don't know, it is kind of ridiculous, because a lot of businesses are doing this like green-washing thing. So business can say look we are doing loads, but actually it is a façade of doing, so I don't really know where to begin.

Henry: I don't expect anything from big businesses. They are just going to do what they want to do unless somebody stops them. That is the thing with big companies, 'cos they don't have a soul, they don't have, there is no even like human beings, it is just statistics, just numbers. That is the company. You know, we think that the company, the owner of the company is someone, is a monster, but it is not, it is just numbers.

Although there was widespread scepticism towards corporate practices this did not lead most of those voicing the criticism to suggest protests against these corporations or any more radical changes. For example, although people thought that corporations should change and produce less emissions, pollution and waste, the proposed changes (such as self-regulation) were moderate relative to the damage caused. One participant suggested

that corporations should donate more money to protect rainforests (rather than suggesting that some industrial and corporate activity is responsible for deforestation in the first place).

> Alexander: Well, some corporations help donate money to sort of try and keep the rainforests from being chopped down, which is a big thing, companies could do more things like that and then industry could just obviously keep, you know, don't produce too much pollution and try and regulate how much you produce, you know, so that it is not over-polluting the world.

Additionally, corporations were also seen to need to lead and inspire, to research and innovate, and to produce efficient technologies to enable the public to be more environmentally friendly.

> Bea: They could be coming up with new ideas as to how we can combat climate change and making it easier for people, they keep making for example solar panels, they can make them more efficient to produce more energy for people, and people would be better persuaded to buy them if they were more efficient. So things like that.

In summary, although some participants were fairly critical of corporations and their practices and identified them as responsible and powerful, they sometimes seemed to be at a loss regarding specific measures, and more fundamental changes were not often mentioned.

Relationship between levels. In discussing different levels of responsibility and possibilities for action participants raised many points that touched on the relationship and interaction between levels (partly mentioned already). These points relate in part to the effectiveness of taking action on each level, as well as to how the specific dynamics between the individual, governmental and corporate levels influence inaction on climate change.

Governments and corporations were often described as holding more power and resources than individuals to bring about larger changes.

> Danielle: I suppose it is easier for governments to make a bigger change, because they have far more power than an individual person, so it would be relatively simple to get them to kind of cut down on emissions and, I don't know, other stuff that helps stop climate change.

However, individuals were also seen to have a responsibility to act, because it is normatively the right thing to do.

> Tina: Do I think I should (recycle more)? Yeah, because we all have a, like, responsibility to, like, sustain the world, like, we came into it and it was fine and now I think we should, like, we should be people who are looking after it as we are sort of here.

Although individuals were perceived as less effective on their own, there was a sense that everyone can do their bit, every little matters, that doing something is better than nothing and that it requires a joint effort since, if more people take little steps, they achieve more. Individuals were also perceived as key players in influencing governments and corporations through their votes and consumer choice.

> Izzy: I think, well, obviously with the financial crisis they (government) have budget restraints and they may prioritise something over that, something that may appeal to voters more, like maybe they would try and address issues like benefits or unemployment, or well, depends, 'cos it depends who's in government and what the voters want and what-not, and what will upset the voters and what will keep them happy. If energy - if climate change is not a huge issue in the mind of the voters, they wouldn't really care if the government does anything or not.

> Jasmine: I don't know, just things like, you know, not using planes and buses so much, and just cycling, and things like that. It might kind of, if lots of people, lots of the population are changing the way they act, then it might get the, kind of, business leaders to think "oh, ok, well people are actually serious about this, maybe we should get on board too". So maybe, kind of like mass mobilisation or something like that, I am not really sure how that would be achieved.

People were sometimes seen as having influence on government and businesses through protests and boycotts.

> Henry: Yeah, so that they (government) legislate some laws against manufacturing things that will cause damage to the environment, so through targeting the government through some kind of protest action.

Respondents also discussed structural factors that make fundamental change harder and less likely, such as those in power having no real interest in reducing fossil fuel use. For example, when asked whether he thought climate change needs addressing now one participant replied:

> Martin: Yeah, definitely, but it's just, the people who have the power to stop it are the people who have the least a benefit from changing and the most benefit from keeping it the same.

> Elena: I think they (corporations) have, as the government, a huge role but they are just not interested by it, because it is not in their interest to spend. Of course BP wouldn't like to fund renewable energies, if that would mean they would have less money for their oil.

Another structural issue that was mentioned related to the interconnectedness between corporations and governments and their priorities being profit and growth.

> Martin: I think like, I, there is so many things, I think the whole lobbying thing, I think the whole, how politics is influenced so heavily by corporations, I think that's something that needs to like be removed, because obviously it's having such a negative effect.

Some participants described a vicious circle whereby if government did not provide the necessary education for people to be better informed, then voters would not prioritise climate change in their voting behaviour and governments would not address climate change because they focused on what would win votes. One participant indicated that mass mobilisation depended on people who had influence over the media, such as the government:

> Sarah: Whose responsibility or where do you see the mass mobilisation starting then?
>
> Jasmine: Government (chuckles), back to government again, or sort of, you know, people who have the ability to reach lots of people at once, TV stations, or radio, that kind of thing … probably kind of the people who can reach the masses, which sadly is probably going back to the business leaders and the government and things like that, it is like a vicious circle. It is really sad (laughs).

The links between different levels of actors in effectiveness and interests create a complex net of relationships where change appeared difficult.

The imperative of choice. One important theme that mainly related to people's ideas about individual behaviour change was the imperative of choice. Several participants emphasised that any changes made would have to occur on a voluntary basis. Linked to this theme is the importance which some participants placed on the role for better information, whereby they assumed that better information would lead people to make better decisions.

> Bea: Everyone can do their own bit, you can't really force people to take part, it has to be people's own decision, whether they want to help. If people know the facts then people can make the decisions for themselves, what they want to do … I think people need to be more informed, if people know what all the information is, they can make better decisions, about what they want to do, about whether they want to help, 'cos it would take everybody to do their bit to make a big difference.

The connotation of vocabulary such as 'help' and 'choice' is one of 'doing good', as opposed to an action which should be a matter of course. On the one hand, the idea that

everyone can do their own bit and people can make their own decision entails an underlying individualism, whereby every individual should have the choice to change or not. On the other hand, the suggestion that everyone ought to decide individually is simultaneously problematized by Bea's suggestion that it would require a collective and combined effort to make a big difference. Following a similar line of argument, it was suggested that people were less likely to get involved if they felt forced to do something.

> Charlotte: Like a business, if you are running a business don't bring out a measure or a rule or something that has been imposed, don't make the people feel like it is being imposed on them, if you are going to tell people "oh no, you have to recycle, or you have to do something and, you know, you have to drive cars like this or that", people are not going to do it, tell them that they have a choice of doing it and what are the pros and cons for it … Simple things have to be put in place. Don't impose them … you will see that you can make it a habit.

The above statements suggest that simple and gradual changes are required, where everyone can make their contribution. Further, it is emphasised that people should not be forced and that rather it has to remain their own personal decision.

Need for more information and education. As already apparent in the extracts related to the imperative of choice and government responsibility, a very common suggestion was the need for increased awareness through the provision of more information and education. The assumption is that if people are more aware and know more they will make better choices and change their behaviour.

> Tina: I think people need to be more aware of the problem and aware of how to help towards the problem, so like obviously people know about like reducing the amount of water they use and electricity, but I think more people need to be aware of it.

> Oliver: I think the most important thing at the moment is to stop, we should change people's opinions, to inform them properly that, it (climate change) is a thing that is happening and it is not us that is going to be affected, it is going to be our children. And that it is a real problem and it will become the end of humanity and we should stop it as soon as possible. We should do everything that we could.

Corporations were also suggested to play a role (although far less so than government), for example by better labelling of products and thereby enabling more informed individual consumer choices.

> Quinn: Obviously for people's awareness, the signs (labels) on products, what's the impact on climate change, this could change … Yes it is difficult to change

behaviour … but consciousness is obviously one part … For example, yes I think we need symbols maybe on products that are many, over the day (over the course of the day), every time you (are made) aware of the impact of your action.

It was also argued that better information and education would gradually lead to a change in routines and thereby lead to a more fundamental and long-term change.

Tina: I guess, like if you teach younger kids as they grow up, they will teach their kids to do the same, 'cos I know my little brothers they have been taught about recycling and stuff in primary school and they are more aware than me of how to be more energy efficient, so I guess yeah, if you teach the younger generation how to incorporate into their routine then as they grow up the future generation will, I guess.

Although so much importance was given to more information and education, some also mentioned that the topic of climate change and related pro-environmental behaviour has become worn-out, tedious and boring. Therefore a new angle to reengage people was seen as required.

Kate: Maybe start educating people more? Although this is hard because at school we've all, it is just so repetitive, schools always hear the same thing, like, recycle otherwise you will pollute the planet, but maybe look at it from a new angle, but education to start with and then maybe some sort of reward system, I don't know … it is hard, well education once again but, even I get bored of it, like, when I am told to do this, do that.

In addition to government and better labelling of products by corporations, the media was also said to play an important role in increasing people's awareness about climate change through further information. The media was sometimes criticised for its lack of urgency on climate change and for diverting people's attention to other topics, such as terrorism and increasing support for the military.

Sarah: Why do you think government isn't investing more money in renewable energy and instead in things like military? (Picking up on something Elena said.)

Elena: Why they are spending more money in military? Oh because it is what people see in the news, we don't see how the South Pole is melting and how we don't have glaciers anymore, but we see how many people have been killed in Afghanistan or this terrorist attack, so it is just a matter of advertising as well, and the news as well, they play a huge role in this. And of course with all this crisis and terrorism and the people scared of a war, the next war, big war, nuclear war, they don't really care in the things they don't see. So of course they will spend money into buying poppies for the military thing … they prefer to attract our attention to the matters that they want to tackle, like military.

The extent to which the imperative of choice to engage in 'pro-environmental behaviour change' was highlighted, relates back to the fact that individual behaviour change was at the forefront of people's minds when asked about mitigating climate change. Information and education was seen as crucial to influence and enable people to make informed choices and thereby bring about said behaviour changes. Participants pointed towards government and the media as responsible for improving the access to, and provision of, information on climate change, i.e. as enablers of behaviour change.

Opposing environmental and economic interests

Another crucial theme in relation to addressing climate change was a tension noted between the role of the economy (such as economic growth and companies' profit motives) and climate change mitigation. Although the extracts presented below do not constitute outright critiques of capitalism, they are in some cases reflective of people's awareness and criticism of practices which characterise capitalist structures. In contrast, other extracts reflect the extent to which economic practices are taken for granted, how engrained certain economic discourses are and how economic and environmental interests have been constructed as mutually exclusive. The subthemes relate to economic costs of climate change mitigation and adaptation, prioritising the economy over climate change, the profit motive and supposed win-win solutions.

Economic effects of climate change mitigation and adaptation. There was a discourse in which the economy and climate change mitigation were seen as conflicting because of perceived economic drawbacks to mitigation. For example, one participant noted a tension between continued economic growth and addressing climate change. She criticised high emission countries for sacrificing the well-being of future generations and poorer countries in return for short-term economic gain. She also acknowledged that some countries were already being affected, despite those countries not having high emissions and lacking the power to influence other countries. Her statement highlights an awareness of climate injustice, which was not often mentioned.

> Danielle: Say for example if the USA was going to try and do something about climate change it would have to cut down its production and emissions and everything and that would just be bad for the economy and I suppose because it wouldn't see the benefits straight away, it's just kind of thinking, "ah never mind, that's for future generations to deal with, let's just keep ploughing on with what we are doing now". But then poorer countries are feeling the effects of climate change, but they can't do much about it, because they are not putting

emissions out as much as bigger countries, bigger powers anyway (laughs). It's a problem.

While Danielle mentioned that climate change mitigation would be costly to the economy, Izzy highlighted the economic impact of the consequences of climate change, such as extreme weather events. She also described how climate change would affect countries differently. It is noteworthy that in relation to floods in the UK, Izzy mentioned the toll on the economy rather than how people were affected in other ways. The extract below is part of her response to the question about whether she thought enough was happening globally to actually address climate change.

> Izzy: I mean they could do more collaboration really, because like it affects people differently, it can make one country's climate hotter, to the extent that it changes what you can grow, like your crops and that can affect your economy and in the other country it can cause, like, push natural disasters like storm and like unsettled weather, like floods, floods that we had in England that just broke out two weeks, one week ago, that was pretty bad and I am pretty sure the economy took quite a big toll in that.

Prioritising the economy over climate change. It was sometimes suggested that climate change was not a priority because people had more pressing issues in their lives, such as the economy, getting a job and earning money. For the same reasons climate change was not seen as a core issue in deciding who to vote for.

> Kate: I think people would, that is not their priority considering how many problems there are nowadays, like the economy and stuff, they wouldn't be like "oh yeah, I will vote for him, 'cos he wants the environment to be protected" (laughs), I don't think it would work … It is more people's attitudes like, because they are so preoccupied by, I guess, more important things in their lifetime, they don't really care about what is going to happen in two hundred years, because they don't recycle or whatever. And it is fair enough, like if someone is in need of money they are not going to think "ooh, let's recycle that would be better than getting a job", like I don't know. Too much on people's minds.

This extract illustrates two underlying assumptions. One assumption is the previously mentioned notion that climate change is a future problem. The other assumption is that economic and environmental interests are opposing and mutually exclusive. The statement indicates that the perceived opposition between the economy and the environment exists both on a personal level (recycle or work) and in relation to a more structural level (vote for the environment or the economy).

The profit motive. The following extracts illustrate how some participants discussed the conflict between profit motives and environmental sustainability. This is

an extension of the above theme concerning the prioritisation of the economy over the environment. Several participants mentioned that corporations cared about profits and not about the environment and climate change. For example, Jasmine thought that business practices would have to change for there to be any real improvement, but mentioned that it would not be profitable.

> Jasmine: But it is tricky because you have got, you know, business interests and quite often they clash with you know environmental interests. It is quite rare I find to, kind of, find someone who is making money but also wants to save the planet as well … If we want to have real change it probably should start there (with businesses) … It is probably not that profitable, it is not necessarily in their interest, because they probably don't get that much from it apart from, you know, saving the planet. Yeah, it is probably not on the list of priorities, the top of the list of their priorities.

Jasmine's comment that businesses would not gain much "apart from saving the planet" highlights how engrained the idea of profit is, to the point that it appears normal for businesses to seek profit even if the planet is destroyed in the process. Although corporations' profit motive was sometimes viewed critically, change was seen as improbable. Danielle, for example, commented that corporations were all about profit and therefore less likely to care about climate change. In connection to this she suggested that it would be better if they could work differently, but she thought it might not be possible.

> Danielle: I suppose corporations again are all about the profit and just like the wheels of industry and chucking out all their products, so they are not going to be bothered about climate change at all. But I suppose in a perfect world it would be good if they could change the way they work to, I don't know, use sustainable energy, things like that, maybe wind power or tidal power, but I don't know how much that is possible.

Her comments contrast the status quo of what *is* (corporations focus on profits) with what *should be* (in a perfect world corporations would change). Similarly, Phoebe suggested that corporations needed to change their priorities slightly (although the use of the word' slightly' implied that only a moderate change was required). It is also noteworthy that Phoebe stated that corporations "obviously" focused on profit, suggesting that it was common knowledge.

> Phoebe: I think obviously they (corporations) tend to focus heavily on things like profit and that's their priority as opposed to what are we doing to the environment. So I think they need to, like, change their priorities slightly.

Ryan commented that it was "logical" for corporations not to sacrifice money in order to become greener, which illustrates the dominant reasoning pursued in the current economic system.

> Ryan: They (corporations) should definitely be investing in ways to make themselves greener. The only thing is, corporations would then lose a lot of money so I understand why they don't, it's logical. But they should be.

His statement again highlights the contrast between what is seen as logical (making money) and what is normatively or morally considered the right thing to do (being green). This is also apparent in how Gwendolyn and Alexander noted a tension between how things could be ideally or theoretically, versus what was reasonable or realistic. For example, Gwendolyn listed some changes that corporations ought to undertake, such as generally reducing emissions, using less chemicals, recycling everything and when I asked her if that was "something we can expect corporations to do?" she responded in the negative.

> Gwendolyn: No, of course not. Yeah, so there is different levels, there's, like, what ideologically, like, should they do and there is what can they reasonably do.

> Alexander: Yeah, I mean but it (significantly reducing emissions) would take a big effort, I mean realistically, I don't think it could happen so that it would reduce it (climate change) a lot, but theoretically I think it could, if you get what I mean.

In contrast to Ryan's view of what he called "logical" (i.e. that corporations do not invest in becoming greener because they would lose money), there were some participants who did not see the priority given to money as logical. Their views demonstrate a contrasting discourse around profit and the environment. For example, Oliver gave the following response when asked about what governments around the world should do to reduce the degree of climate change.

> Oliver: I think they should all stop being a bit … maybe be a bit less ignorant and greedy and stop focusing things into short-term gains, like I think it is ridiculous to think that getting money from eco, like, it doesn't seem logical to, like, trade in part of an eco-system for money, it just doesn't seem like a long-term, a long-term gain. Like, you'll get money very, like, perhaps just find more sustainable ways I think to do it. It just doesn't seem logical to me to chop down trees for money to then have no eco-system for something else.

While most of the above extracts illustrate some extent of desire for change towards less environmental damage and, in some cases, towards a less profit-oriented world, many

participants viewed change as unlikely and their suggestions for change sometimes seemed constrained by the way things are, as change seemed unrealistic.

Win-win solutions. A commonly proposed approach to solve the perceived conflict between the profit motive and climate change mitigation was a 'win-win' scenario in which profits could continue to be made in a sustainable way. The prevalence of these suggestions indicates the extent to which the need for profit is taken for granted and remains predominantly unquestioned. For example, Danielle, Laurence and Sophia suggested win-win scenarios in which corporations needed to be incentivised to reduce emissions and become more 'sustainable', while able to make a profit.

> Danielle: How many people can have access to these green powers, I am not really sure. So maybe more focus on that would be good, more technology in that area and then it could be, like, then maybe it wouldn't make a difference to the big corporations. They could easily, cheaply, use that energy which is good for them for their profits, and also for the environment, so everyone wins, that would be good.

> Laurence: Again, like government, they (corporations) should lead and inspire, but their bottom line is the profit, so I mean at the end of the day, they have a legal duty to make a profit for their shareholders and they will do that the cheapest way possible, which is unfortunately usually the most environmentally unfriendly way possible, so, I mean, they need incentives as well … so that they can make a profit but still convert to more, greener, way of life.

> Sophia: I think they (corporations) should think about the waste management and their energy efficiency … because it is very difficult, they have to have some incentive to do that … They are like seeking profits so they should have incentives … otherwise it is very difficult to say that they have to be, have to do something.

Rather than looking critically at the profit motive, the win-win approach seeks a solution that claims to address environmental issues while maintaining the economic status quo. The above statements appear to take profit-oriented corporations for granted. The win-win suggestions represent an attempt to reconcile the conflict between economic and environmental interests (mentioned above) without fundamentally questioning the economic system.

Representations of individual and social change

This final theme encompasses two subthemes, the first of which touches on criticisms of the status quo and views on protest, while the second one relates to reasons for inertia.

Views on structural change and protest. Some participants noted a conflict between economic interests and environmental protection but only very few concluded that the economic system needed to change. In contrast to the accepting stance of a win-win scenario above, Martin argued that an alternative economic system would be required, demonstrating a more uncommon and marginal way of thinking.

> Martin: I think that our impact can only be reduced if there is, like, a global change in what kind of system we use for economics, 'cos at the moment we are using a growth-based economy which is based on inflation. The more, more stuff we do, the more we are just trying to grow and grow and grow. And 'cos there's only a finite amount of resources on this earth … we'll run out at one point … So basically, what we have to do is change from this kind of growth-based economy to a more flat rate economy, so we are not trying to increase production all the time, we are trying to level it out, and in some areas reduce it.

Martin later commented that he did not see change happening through 'revolution' and it remained unclear how the proposed economic shift would come about.

Although less common, some participants pointed towards protest as a means towards more structural change. Elena commented that she was supportive of protests and people acting collectively to put pressure on and "push" the government and the media (although not as far as a revolution), but she added that she herself did not engage in protest.

> Elena: I think we don't realise our real potential until we, until we speak up, I am not talking about the French revolution but we should do something else, yeah, definitely … In the sense of pushing a bit more, the government, in that kind of issues. But I guess this is really hypocritical because I am not doing anything anyway, but people as a whole, as a group, to push these organisations, that they have a bigger role and then push the government and the news and channels, internet.

Gwendolyn mentioned revolution but saw it as highly unlikely or as potentially right-wing oriented and suggested that a change in people's consciousness was required, but she was unsure about how that change could happen.

> Gwendolyn: Just to repeat that it is not something that I necessarily believe could actually happen, it would be awesome if it did but, like, I don't know, when people talk about revolutions, but to me, like, political revolution, a) in this country I think a political revolution now would be a disaster because it would

be to the right … and there is no, like, systems in place, like, for people to eat the day after a political revolution happened, so, yeah, I'm kind of into this idea of a conscious - consciousness revolution, where people's thinking just completely changes over night. How that is going to happen, I don't know.

In contrast, Henry proposed the need for protests that went to the heart of the manufacturing process. However, he thought this might be considered violent. He continued by questioning whether protests that might commonly be regarded as violent actually were violent when contrasted with the violence involved in environmental destruction. This clear invocation of environmental destruction as violent was unique amongst the participants I interviewed.

> Henry: I think, active protest, I have kind of like, there is a lot (of) people who have this kind of like, "yeah let's protest, let's do this, let's do that", but in the end you just, like, see them shouting and going home, carrying on with their lives, but, like, really active things … maybe things that would really cause some change, or like really, kind of, protest, that would let the company owners or the people in the government really think about doing change. That kind of protest can sometimes be seen as violent, but not as violent as they are, actually, they are violent … Going to, like, disrupt the actual manufacturing of those products.

Drawing on the example of Germany and a longstanding protest movement against nuclear power, one participant highlighted that protests could be effective, implying that social movements were required.

> Quinn: It (nuclear power in Germany) has been banned now … it's on the way to getting I think within 7 years there's no more nuclear power stations. And this started in the 80s with the Green Party, so obviously this discourse which happened in the country (was effective). Now, this rule was by the Conservative Party (the ruling to phase out nuclear power occurred under Conservative Party leadership) so obviously this discussion from social movement and stuff helped to bring social change on a broad and national level. So I guess this social movement - discussion, discourse - helps.

Some participants mentioned that a more radical change was necessary to address climate change, i.e. that it could not be done within the current paradigm. These participants' ideas seemed to focus less on individual lifestyle change and more on a need for collective action and social movements. Participants' ideas of protest, social movements and revolution discussed above were highly varied, including some doubt as to whether processes for larger fundamental change were even possible or realistic.

Reasons for Inertia. As well as discussing structural barriers to change, participants named different reasons for their own inertia and other people's inaction.

Scepticism or helplessness. Some reasons given for inertia were that people do not believe climate change is happening or that people do not know what to do.

> Gwendolyn: There is also a lot of disinformation, so I think more and more people are climate sceptics than there used to be and I think now that the issue has, kind of like, gone through people's minds and, like, gone out again. Like, people see it as either 'it is fake' or they can't do anything about it. Like most people think one of those two things.

Lack of motivation or care. Another reason for inaction on climate change concerned the notion that people did not care enough, partly because they were not yet affected and because climate change was not seen as a huge problem. With regard to herself, Izzy mentioned that she was not that engaged with climate change, so there were some changes she was willing to make in her own life, but not to the extent of reaching out to other people.

> Izzy: Just, like, instead of taking the bus just cycle, just switching the lights off and insulating your house. But then if you are not an active person, if you don't really care about the whole climate change issue - not because you are oblivious to it, but you just don't think it is like a huge problem and you think that like it won't affect you during your lifetime - then those people could just - because making the changes in your life is, has to be, an active choice, so you actually have to care about the issue quite a lot to actually carry out those actions, even though they are very little actions … I think, well, (what) I (would be) happy to do … is like change a bit of my lifestyle. But as to reaching other people and telling them to change, I think I am not passionate to that extent yet.

Tina mentioned not being that motivated to change a routine.

> Tina: I guess I am not really motivated (laughs). Yeah, I am not really motivated to doing it. It is not, like, it's just not in my daily routine, like, sometimes I will be, like, "oh that belongs in the recycling" and then I will put it there but sometimes I just like put it in the bin without even realising, because like it is not normal to me I guess.

Some respondents noted that people did not care, because they were too comfortable.

> Elena: I just generally think that people just, I am sorry, but they don't give a shit about the future. They just don't think to what extent we are ruining everything and how fast it is going, because they have their laptops, they have their little bubble.

The impression that many people did not care was sometimes related to feelings of pessimism that anything would change.

> Martin: Well, I do have quite a negative outlook on, like, the end results of all of this. But, I don't know, I just don't see it happening and I don't see even within,

even within my course there's people who don't - there is not enough - people don't really care enough, even within Ecology.

Other priorities. There was also the notion that people are too busy and have too many other things to worry about, such as more immediate economic concerns.

> Martin: I mean, a lot of people have this idea that there can be this like big, sort of, revolution. But it's not really going to happen, because people have too much, like, things to worry about already, without really starting some new kind of wave of something.

Change as unrealistic. There was also a sense that change does not seem realistic or feasible, so that alternatives to the status quo seem impossible and unlikely. This was sometimes tied to the notion that some degree of climate change is inevitable. Talking of getting people to fly less, one participant commented the following:

> Jasmine: Ideally, I would just cut out everything and just, you know, get people to sail boats to places and stuff. But obviously that is not feasible, necessarily, but you know, ultimately, climate change is sort of inevitable but I think we can slow down the effects of it.

Kate argued that it is unrealistic to think that as a society we could "go back" to the way things were (before the industrial revolution). Going back was the main alternative to the way things are now, that she mentioned. Thus, she (maybe inadvertently) seemed to accept the way things are ("it is just the way it is now") rather than considering a third option for change.

> Kate: I think in order for something to actually change probably everyone would have to put their mind to it, so we are being a bit unrealistic in thinking we can change something. But I do think people should catch the train or bus more and, like common transport … Maybe we will be able to avoid catastrophes, but I don't think we will be able to go back to how it was one hundred years ago, because of the whole industrial revolution thing, it is just the way it is now, like, we can't go back.

Inconvenience and laziness. Another reason for inertia that was mentioned concerned the convenience and benefits of what was considered the more environmentally damaging action, e.g., holidays being nice and transportation often being cheaper by plane.

> Jasmine: Yeah, I mean, ideally I wouldn't fly anywhere. But, you know, fact is, holidays are nice and it is the easiest, cheapest way of getting to places, which I think probably is part of the root of the problem. Because flying is so cheap that people, you know, are more likely to use that than, sort of, longer methods of trains and boats and stuff.

In line with the reasoning that 'pro-environmental' actions were impractical and inconvenient, participants also suggested that people were too lazy to make the extra effort.

> Kate: Because some people are lazy so if there is, if, you know, there is a truck coming, for example, just have it (the recycling) outside of your door and they will come and you just help them load it onto your truck or whatever. Just a new way of recycling or whatever. Just something new - more practical - for people. 'Cos for me where I live, back at my parents, we can only recycle card and paper where we live and we have to actually go to Sainsbury's, which is, like, five minutes away by car to recycle glass and whatever else and that is just annoying. So if someone actually drives to yours, like, they will actually ensure that you are giving them the right stuff and you are not mixing everything to start with.

> Nora: I think it's a case of convincing people that it's a real problem and tipping them over the edge of whether they can be bothered and how important it is. They need to be convinced that it is more important than being lazy.

> Laurence: I'm lazy, you know, if I am tidying up I just put everything in the bin bag and throw it out, if you know what I mean, it is pure laziness … You need everyone to do it, it needs to be a joint effort and it doesn't seem like the majority of people are prepared to do anything. I mean, I include myself in that 'cos I am too lazy to recycle, so you see what I mean.

The same participant suggested that laziness and inconvenience were linked to the fact that people did not really feel affected by climate change yet, which was another commonly mentioned reason for inertia.

> Sarah: Why do you think people aren't prepared to do anything?
>
> Laurence: I guess they don't believe any change will really happen in their lifetime, they will never see any change. You know, their life is geared so (much) towards convenience these days, anything that makes things a little bit more inconvenient, people aren't really interested in, you know, until there is a major catastrophe and people do really feel like it can affect them, they probably won't do anything.

> ***Lack of personal experience.*** The idea that it would require a catastrophe such as a natural disaster for people to feel affected, wake up and change was mentioned regularly. Several participants suggested catastrophes might be necessary as a catalyst for change to start action on mitigating climate change.

> Ryan: I mean, if something's not affecting your life directly, you're not going to change it because climate change isn't affecting me directly … I mean there's nothing bad happening to me because of climate change. Whereas, if there was then I'll definitely change my lifestyle … But personally, I think you have got to show how it affects somebody themselves. Because if it doesn't affect them,

then they're not going to do anything about it. You have to show how it affects them personally.

Jasmine: Probably more natural disasters to kind of wake people up. Obviously no one wants a natural disaster, but if that's what is going to happen because of climate change, then I think that is the only thing that is going to, kind of, open people's eyes to actually the fact that they need to change things in order to prevent this kind of thing happening. But until more of that happens, you know, you are not really going to see that much of a change, (on) a sort of day-to-day, and therefore I don't think they'll (businesses), kind of, be that willing to change things unless something drastic happens.

Gwendolyn: Maybe there has to be some kind of social upheaval. Maybe because this country has been politically stable for such a long amount of time, people are so embedded in the way that things are. The way that they think that things need to be, maybe it needs some kind of natural catastrophe or social, really big social upheaval for there to be a shift in the way that people see things.

Participants' comments suggest that people are so established in the status quo that they would only react once they were directly affected by the consequences of climate change, i.e. that it required a natural disaster to bring about change. Catastrophe was mentioned as necessary based on the assumption that people were more likely to react if they personally experienced the effects of climate change in their own lifetime. This ties into the aforementioned discussion about the perception of climate change as a distant threat in terms of space and time. These comments underline the assumption that many people only act if climate change affects them and not out of concern for others, in other parts of the world or future generations.

Discussion

Four themes were the focus of the above analysis. The first theme - representations of climate change - related to participants' uncertainty about the reality and severity of climate change. In the interviews several participants were not convinced that climate change was anthropogenic or that it posed an immediate global threat. Hobson and Niemeyer (2012) devised a diagram with components of climate change scepticism, where the nature of scepticism was classified into three categories: reality (is climate change real); causality (is it human induced); and impact (is it a problem). Participants who expressed scepticism about climate change in the current study mostly seemed sceptical about the cause and impact, as they questioned whether climate change was human induced and whether its impact was immediate. Some participants suggested that climate change posed a future problem, which taps into

Hobson and Niemeyer's (2012) category of displaced scepticism. Drawing on Cohen's (2001) typology of different forms of denial, Hobson and Niemeyer (2012) described interpretive denial in the case of climate change as follows: "Interpretive denial encompasses rationales like 'it may be happening but is caused by natural cycles/is not that big of a deal'…" (p. 398). In the present study, participants also drew on previous ice ages and past natural changes to support the idea that changes had always occurred and were natural. The fact that past climatic changes occurred without human influence was taken to imply that current changes were not influenced by humans, which indicates a flawed understanding of causality. Furthermore, cyclical patterns like ice age retreat and expansion were used to suggest a higher natural order in which cycles of destruction and repair were meant to be or inevitable.

A key question is what influences people's understanding of climate change and also how that understanding affects people's assessment of the required response. Leiserowitz, Maibach, Roser-Renouf, Feinberg and Howe (2012) found in their nationally representative sample of US citizens that political orientation influenced people's level of support for different policies to mitigate climate change. Norgaard (2011) highlighted that greater understanding of climate change did not necessarily result in increased concern or concrete action. Similarly, in their Australian sample Leviston, Price, Malkin and McCrea (2014) found, that how sure people were that climate change is happening and how much they thought climate change will harm them, did not add a unique contribution to the prediction of pro-environmental behaviour (while, for example, personal relevance and feelings of ethical responsibility did). In the present study, despite differing beliefs about anthropogenic climate change, most participants agreed that some action to reduce emissions was required and often suggested similar measures. Those who were not convinced about anthropogenic climate change still argued that emissions were generally damaging for the environment and health, and should therefore be reduced.

Stoddart et al.'s (2012) study showed that participants viewed individuals as a driving force to pressure government and also suggested lifestyle changes. Similarly, lifestyle change was repeatedly mentioned in the present study. Several participants' primary response related to individual behaviour change and this was also the area for which participants had the most concrete suggestions for action. Further, it is noteworthy that participants focused on suggestions like recycling, but rarely mentioned

the need to reduce consumption in the first place. The heavy overall focus on an individualised approach is in line with authors who have suggested that pro-environmental behaviour change campaigns could be problematic, as they fail to emphasise large scale systemic approaches and instead place the responsibility for change on individuals (e.g., Kent, 2009; Maniates, 2001; Norgaard, 2011, 2017; Shove, 2010; Webb, 2012). For example, Norgaard (2011) argued that: "Americans are so immersed in the ideology of individualism that they lack the imagination or knowledge of alternative political means of response" (p. 192). The present interviews suggest that a lack of alternative political measures beyond individual actions may also apply in the UK.

Government's role was also related to individual lifestyle change, as the government was seen as an enabler and provider of information. Beyond that, suggestions for government action involved changing legislation, regulating corporations and investing in renewable energy. However, compared to the numerous specific suggestions put forward for individual behaviour change, the suggestions for government remained less specific. This tendency indicates that the public may be better versed in suggestions for lifestyle changes, which could be a consequence of more exposure to these kind of suggestions and a lack of information about other approaches.

Many people in the present study agreed that government should play a crucial role in addressing climate change (see also Stoddard et al., 2012), pointing towards government's increased power and impact. However, some participants were sceptical that the government would support pro-environmental change, because of its threat to economic growth. Also, several participants indicated that, although government ought to regulate corporations, this was unlikely because of government's entwinement with corporations and lobbyists (see Kent, 2009). Further, participants were somewhat sceptical of corporations' willingness to reduce emissions, although there was the sense that they should.

The notion of individual behaviour changes was often accompanied by an emphasis on having 'the choice' to change and to 'help'. The discourse of choosing to 'help' the environment is noteworthy for two reasons. Firstly, 'helping' implies assisting someone else, as if the environment were detached from the participant herself and separate from humans' and other animals' well-being more generally (see Ingold,

2000). This is in line with Webb's (2012) analysis that: "The demands of everyday life dominate over what can be compartmentalized as more distant concerns about an objectified external environment, treated as separate from human life and well-being" (p. 121). Secondly, in a different context it would not be classified as helping when someone reduces or stops a damaging action. For example, if person A was hitting person B, we would not tend to refer to A helping B when the hitting stops. The use of the term 'helping the environment' when someone decides to engage in less environmentally damaging behaviour suggests that the taken for granted 'normal' state of affairs is one of environmental destruction. If environmental pollution were not the norm, then reducing pollution would be expected, rather than treated as a good and voluntary deed.

Perhaps the focus on choice and helping is indicative of the ways in which 'consumers' are abstracted from the production process, as described by James and Scerri (2012):

> … individualism in the North is anchored in relatively heightened desires for unbounded lifestyles and autonomous choice. Persons there avidly choose from among what is on offer and consume in ways that are abstracted from the direct consequences of the capitalistic production–exchange relations which sustain their choices. (p. 226)

Since the lifestyle of choice in the global North is based upon social and environmental exploitation elsewhere, the line of argument that focused on individual choice, even if unintentionally, shows little awareness of "climate justice". Stoddart et al. (2012) described a climate justice approach as one that tries to address climate change while taking into account social justice:

> The notion of climate justice highlights the significant differences in the social groups who are most responsible for creating the problem (predominantly those in the global North) and those who will suffer the most severe consequences of climate change (predominantly those in the global South). (p. 53)

People in the global South have not had the same options for choice in lifestyle and people affected by climate change will not have a choice either, yet there was little mention of this in the interviews.

Participants' emphasis on the choice to reduce one's environmental impact might be reflective of a more general prevalence of choice narratives in Western societies. Maniates (2001) succinctly analysed how narratives of choice are sustained

through the presentation of options in the market place, when ultimately it is an *illusion of choice*, because crucial options such as good public transport are not available:

> The marketplace, for example, presents us with red cars and blue ones, and calls this consumer choice, when what sustainability truly demands is a choice between automobiles and mass transit systems that enjoy a level of government support and subsidy that is presently showered upon the automotive industry. (Maniates, 2001, p. 48, referring to work by Roodman, 1996)

According to Kent (2009) the choice narrative is crucial, as neo-liberalism has produced concepts of rational individual responsibility for environmental issues which depend on notions of freewill and freedom of choice.

The choice narrative is also closely tied to the importance that participants gave to providing more or better information as a means towards addressing climate change. This is in line with Maniates' (2001) observations of his students. Further, drawing on the famous Dr. Seuss children's story of *The Lorax*, the author examined how discourse around information is implicated in the individualised response:

> This response half-consciously understands environmental degradation as the product of *individual* shortcomings … best countered by action that is staunchly *individual* and typically *consumer-based* … It embraces the notion that knotty issues of consumption, consumerism, power and responsibility can be resolved neatly and cleanly through enlightened, uncoordinated consumer choice. Education is a critical ingredient in this view—smart consumers will make choices, it's thought, with the larger public good in mind. Accordingly, this dominant response emphasizes … the need to speak politely, and individually, armed only with facts. (pp. 32-33)

Although partly constrained by the questions used in the interviews, which will have guided participants' responses, there was a dominant focus on government and individual responsibility, whereby government was required to better educate the public in order for individuals to make better choices. Further, in line with Stoddart et al. (2012), I also noted that the possible role of communities or international bodies was not touched upon. This is unlikely to be explained fully as an artefact of the interview schedule, since the opening question was broad and general. Additionally, as I asked about the role people saw for themselves and their friends and family, the formulation of the question did not preclude suggestions of acting collectively or as a community. Seemingly, international and collective approaches were at the margins of suggested responses.

Another theme in the interviews related to a contradiction between environmental and economic interests. Some participants described the environment and the economy as separate and conflicting entities. Participants identified a clash of interests between capitalist motives (corporations' mandate to make profits and a growth oriented economy) and successfully tackling climate change. These contradictions have been discussed by authors such as Klein (2014) and Clark and York (2005). However, the aforementioned writers saw environmental destruction and social and economic injustice as inherently linked to capitalist production. They argued that therefore a fundamental shift in politics and economics could ensure both economic and social - as well as environmental - well-being. In contrast, the way in which participants framed economic and environmental interests resulted in a 'false' dichotomy, in which they had to choose between the well-being of one (the economy) or the other (the environment). One of the ways in which some participants attempted to resolve this contradiction between environmental and economic interests was to propose win-win scenarios, whereby profit motives and sustainability could be combined. This might result from a sustainability discourse appropriated by governments' and corporations' green-marketing strategies. This approach side-lines the legitimacy of corporations' profit-margins and has found some acceptance in the public. These findings are in line with Maniates (2001) suggestion that win-win approaches dominate environmental politics. He described that a large array of technologies are presented as an environmentally-friendly and economically-smart means to a conflict-free transition (such as fuel-efficient cars).

Some participants criticised the prioritisation of the economy over the environment, while others viewed it as understandable and 'logical'. The latter kind of discourse, whereby profit and growth are treated as logical, relates to Harvey's (2006) suggestion that political economic structures have come to be taken for granted:

> Neoliberalism has, in short, become hegemonic as a mode of discourse, and has pervasive effects on ways of thought and political-economic practices to the point where it has become incorporated into the common-sense way we interpret, live in and understand the world. (p. 145)

There was little mention of any need for systemic change in economic production (as argued by e.g., Klein, 2014; Luke, 2008).

A few participants did mention that they thought a larger scale change was necessary but, like others, they saw it as unlikely. The importance of believing that

alternatives *are* possible is highlighted by Maniates' (2001) suggestion that ideas have power and that ideas are continually being separated as either realistic or idealistic: "Once labeled, what is taken to be impossible or impractical—" idealistic," in other words—can no longer serve as a staging ground for struggle" (p. 49). Several reasons were mentioned for inertia, such as lack of motivation, having other priorities and seeing change as unrealistic.

One commonly mentioned explanation was the lack of personal experience of climate change impacts. In line with participants' suggestions, personal experience and perceptions of local relevance has been noted by many authors as a potential variable in environmental views and engagement (Leviston et al., 2014; Macnaghten, 2003; Scannell & Gifford, 2011; Whitmarsh, 2008).

One of the limitations of this study is that it draws on a relatively small sample. Additionally, participants may have had different definitions and ideas of what certain terms (e.g., climate change, government, and corporation) mean, but this is not so problematic, as I was interested in their responses based on how participants use and understand these terms in everyday life. Future research could investigate how to increase awareness and support for climate change mitigation beyond the individual level; as well as questioning underlying economic assumptions. The question remains as to why people who express criticisms of the status quo, and suggest that ideally the world would be different, do not act on this. This too needs to be explored.

In conclusion, there was overall support for climate change mitigation. Many suggestions related to individual behaviour change, but government and corporations were also seen as having responsibility. Participants identified complex relationships between different levels of intervention whereby, for example, individuals could pressure government, but government was also seen as having the obligation to inform the public better. Several participants were sceptical that corporations - whose priority it is to work profitably - would contribute to reducing emissions. In public debates and campaigns it may be important to discuss functioning alternatives to the current economic and governing systems, in order to expand approaches to climate change mitigation and make alternatives seem possible. Further, debates encompassing the economy, and social and environmental well-being need to be more widespread to counteract the narrative whereby they are constructed as separate and mutually exclusive. In climate change campaigns it is important not to present the environment as

something that needs protecting in and of itself, but to emphasise the interdependence of humans and the environment. Increased focus on climate justice is also required to expand notions of climate change mitigation beyond the expectation that it should be a matter of choice. It is vital to challenge existing strategies of climate change mitigation, which have often focused on individualised approaches, or the greenwashing of sustainable development (Luke, 2008) and have failed to reduce emissions while creating the illusion of action.

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- Chapter 3 -

Does the framing of individual action influence support for structural level change to reduce carbon emissions?

Abstract

Critiques of the focus on individual behaviour change to reduce carbon emissions (e.g., appeals to drive less) have suggested that the framing of this mitigation approach may detract attention and support from larger political and structural changes (e.g., improving public transportation infrastructure). Using an experimental design, three studies examined how support for structural level change might be influenced by focusing attention on the benefits of individual behaviour change compared to either the (lack of) impact of individual behaviour change (Studies 1 and 2) or to the presentation of beneficial structural level change (Study 3). Study 1 ($N = 297$) showed that participants who were required to think about the impact of individual behaviour change, compared to those who were presented with a positive individual behaviour change frame, were more supportive of prioritising the environment and were in marginally higher agreement about structural level actors' responsibility for reducing emissions. Study 2 ($N = 153$) showed no significant difference between conditions in support for structural level change, but there was a difference between conditions on the level of agreement with the manipulation statement: participants agreed significantly more that individual behaviour change has a large impact than very little impact. Study 3 ($N = 264$) demonstrated that participants in the condition which presented individual behaviour change positively, were more supportive of prioritising the environment, than were those in the positive structural level change condition. Participants in both experimental conditions were significantly more supportive of individual responsibility than those in the control condition. Participants seemed to react favourably towards messages that highlighted the impact of individual behaviour change (contrary to the intended effect of emphasising the lack of impact). Future research using different designs could further examine the relationship between focusing attention on individual behaviour change and support for structural level change.

Owing to emissions of greenhouse gases by humans (mostly caused by wealthier countries), anthropogenic climate change is already having effects on a variety of forms of life across the planet (IPCC, 2013). However, the question remains of how to effectively reduce emissions. One approach to reducing emissions (and thereby climate change) that sits neatly within a capitalist framework, is the attempt to encourage voluntary individual behaviour change. Some sociologists (e.g., Brulle, 2010; Kent, 2009; Norgaard, 2011, 2017; Shove, 2010; Webb, 2012) have criticised the predominant focus on encouraging individual pro-environmental behaviour change, arguing for example, that it obscures the structural factors causing high emissions, as well as taking attention away from alternative mitigation approaches. The present studies examined the suggestion that focusing on individual behaviour change may divert people's attention and support from the more structural level changes which need to be made in order to mitigate climate change.

The individual behaviour change approach

Individual behaviour change approaches are those that call on individuals to act differently in their everyday lives, such as engaging in recycling, switching off lights, turning down thermostat(s) and flying less. Amongst the most common behaviours which people (from a representative English sample) self-reported to engage in were recycling, reducing food waste, and reducing gas and electricity use at home (Department for Environment, Food and Rural Affairs, Defra, 2007). While certain behavioural changes will no doubt be required to mitigate climate change, it may be problematic to make individual behaviour change the focus of campaigns and information that not only promise to help 'save the planet' (e.g., Huffington Post, 2013) but may also detract attention from the social and economic structural conditions which lead to high carbon emissions.

Consider the following example of behaviour change messaging. The United States Environmental Protection Agency (EPA) website has briefly explained the causes of climate change as follows: "The majority of greenhouse gases come from burning fossil fuels to produce energy, although deforestation, industrial processes, and some agricultural practices also emit gases into the atmosphere" (EPA, 2016a). Thus, there is an acknowledgement of broader structures and forms of production which contribute to climate change. The passage is followed by a suggestion to visit another section of the

website for more information on "what you can do to make a difference". The latter presents *easy* and *small* changes that people can make:

> This site provides more than 25 easy steps you can take at Home, School, the Office, and On the Road to protect the climate, reduce greenhouse gas (GHG) pollution, and save money. Take action today! Small steps add up, if we all do our part. (EPA, 2016b)

The proposed changes include using energy-efficient light bulbs and "driving smart". The website also promotes 'sustainable' consumption, for example by suggesting that people look for "Energy Star", an EPA label that demarcates energy-efficient products. This presentation of 'solutions' implies that addressing climate change can be achieved through easy and small steps by individuals at home or at work, rather than requiring a larger structural change that goes beyond lifestyle choices.

Callison (2014) has discussed the example of the Live Earth mega-concerts, a large and expensive attempt to foster public awareness and engagement with climate change: "It was meant to energize the faithful and convince others to care and do *something*—even switching light bulbs from incandescent to longer life compact fluorescents (CFLs) counted as a responsible response to climate change" (p. 40). This underlines the question of what kind of actions people are supposed to, or are being encouraged to, adopt.

Similarly, in a paper critical of traditional marketing strategies for environmental behaviour change, Corner and Randall (2011) gave the example of the UK governments' Act On CO_2 campaign. The latter included a television advertisement[5] which argued that over 40% of CO_2 came from ordinary everyday actions (such as driving cars) and suggested that it was up to 'us' (individuals) to change, for example by switching off lights. The authors examined the question of impact and efficacy of individual actions: "…what *does* constitute a proportional response to climate change? … If a more substantive level of engagement is being sought from the public, then the efficacy of strategies for public engagement is of utmost importance" (p. 1013). However, the strategies employed by many companies continue to place responsibility on the individual, suggesting that taking shorter showers (for example Unilever, 2015, n.d.) is a way of addressing current environmental problems.

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[5] Bedtime Stories, see https://www.youtube.com/watch?v=SDthR9RH0gw

Criticisms of the individual behaviour change approach

At the outset, it is worth briefly considering what the impact of individual action may be, given its widespread publicity. Firstly, there is the danger of individual behaviour change strategies not working because of rebound effects (also known as the Jevons Paradox [Alcott, 2005]), for example, that despite energy-saving devices people end up using the same amount of energy (Sorrell, 2010).

Secondly, Webb (2012) has argued that: "Incremental behaviour change measures, aiming to promote 'green consumerism' within parameters of current consumption, are extremely unlikely to produce the radical reductions in energy demand which the UK's Low Carbon Transition Plan (HM Government, 2009) envisages" (p. 115). Similarly, Shove (2010) has contended that: "Contemporary policy documents bring an accumulated weight of behaviour-change literature to bear on a surprisingly limited set of goals that have to do with encouraging certain styles of purchasing (in which 'green' is the brand of choice) …" (p. 1277). Further, Kent (2009) has outlined how various campaign approaches portray climate change mitigation as simple steps that add up to make a difference and which imply that global targets for emission reductions can be achieved through these individual level actions; in fact, she suggests they will ultimately fail to do so, given the scale of climate change. In support of this argument, Tabi (2013) found that environmentally-aware people in Hungary did not significantly differ from environmentally-unaware people in their CO_2 emissions from heating. The author suggested that efforts to engage in pro-environmental behaviour do not necessarily result in reduced emissions, because well-intentioned actions are sometimes offset by socio-structural factors, such as income and home size.

Norms of attention

Apart from falling short of what individual behaviour change supposedly sets out to achieve, another concern relates to the distraction from other approaches and shifting of attention: "When responsibility for environmental problems is individualized, there is little room to ponder institutions, the nature and exercise of political power, or ways of collectively changing the distribution of power and influence in society …" (Maniates, 2001, p. 33). Kent (2009) also argued that important opportunities for citizen-led action may be lost. Shove (2010) and Webb (2012) have criticised individual behaviour change campaigns for obscuring the role of government

and of economic structures, such as the continuation of a growth-based economy, in maintaining current levels of emissions. So, while the attention of responsibility is focused on the individual, political inaction towards serious reductions in emissions continues (Kent, 2009).

The above points are related to the criticism of the individual behaviour change approach as a politically necessary strategy to maintain certain norms of attention and public distraction. Having one's attention drawn to 'A' involves withdrawing attention (or keeping attention away) from 'B, C and D'. Accordingly, Zerubavel (2006) has suggested that: "Power, after all, involves the ability to control the scope of the information others can access as well as what they can pass on and thus promotes various forms of forced blindness, deafness, and muteness" (p. 15). He has pointed out that there are "… different ways of controlling the scope of others' attention, from formal censorship to informal distraction tactics" (p. 15). Drawing on Zerubavel's work, Norgaard (2011) examined norms of attention in her analysis of perceptions of climate change in Norway. She stated that what individuals decided to ignore or attend to was influenced by social norms for interpersonal interaction (e.g., conversation norms) and the larger economic and political setting. Awareness was not just influenced by one or even several individual behaviour change campaigns, but related to a broader culture in which a limited toolkit of actions for climate change mitigation was presented.

Consider the following example of what is not being talked about and changed, when the focus is on the individual. While government is taken almost entirely out of the frame, one of the polluters not on the reduction agenda is amongst the single largest institutional carbon emitters of the world: the US Department of Defense (Flounders, 2009; Sanders, 2009). In Sanders' (2009) words:

> …even if every person, every automobile, and every factory suddenly emitted zero emissions, the Earth would still be headed head first and at full speed toward total disaster for one major reason. The military … produces enough greenhouse gases, by itself, to place the entire globe, with all its inhabitants large and small, in the most immanent danger of extinction. (p. 22)

Nonetheless, upon US request, all measurements of military emissions were excluded from calculations of US greenhouse gas emissions, let alone restrictions, at the Kyoto Protocol meetings and any subsequent international climate agreements (Flounders, 2009; Flounders, Sanders & Peries, 2014; Sanders, 2009). According to other accounts,

in 2014 the US government featured sixth on the top 100 greenhouse polluters index (Political Economy Research Institute, 2016).

Contextualising individual actions

A further shortcoming of approaches which focus on individual behaviour change is that even when they add context to the predictive factors of behaviour, they fail to examine how needs and wants evolve: "If people seem to be acting in environmentally damaging ways it may be a product of their attitudes and behaviours, but it may also be a function of the conditions in which those attitudes and behaviours are formed" (Uzzell, 2008, para. 12). An approach which locates the problem and solution to climate change within the individual fails to mention the societal structures influenced by political and economic decisions that reproduce these behaviours and disregards why people behave in the way they do (Shove, 2010; Webb, 2012). Norgaard (2017) pointed out that:

> Sociologists will counter that climate change is due to a complex set of interactions between our economic, political, cultural, and social institutions. Individuals participate in these systems, but individual understandings, values, actions, and choices are constrained by their cultural, economic, and political contexts. (p. 176)

For example, the individual approach does not address the topic of economic growth, which is presented as an undisputable public good (Webb, 2012). If individuals were actually to reduce their consumption significantly this would currently cause economic problems. Webb (2012) maintained that any contradictions between sustainable consumption and neo-liberal capitalism are ignored in individualised approaches:

> Radically reducing energy demand, however, means cutting consumer-driven economic growth. Thus far, government policies have avoided confronting the tension, if not direct contradiction, between climate change policies, consumerism and growth. The problem has been constituted as a matter of 'greening' individual consumer choice, through behaviour change techniques, in a self-regulating market where growth can continue. (pp. 111-112)

Distraction from other approaches

By construing and focusing the 'solution' to environmental problems as a matter of individual behaviour change and choice, other approaches to climate change mitigation are obscured (Kent, 2009; Maniates, 2001; Shove, 2010; Webb, 2012). For example, Schor (2005) suggested that given that Western ways of living are

incompatible with sustainability and equity: "… inhabitants of the global North can and should opt for a new economic and social vision based on quality of life, rather than quantity of stuff, with reduced worktime and ecological sustainability at its core" (p. 48). Therefore, as Shove (2010) pointed out, it is important to note that the individual behaviour change strategy is not a neutral or objective theoretical approach, but a political one: "…in that it obscures the extent to which governments sustain unsustainable economic institutions and ways of life, and the extent to which they have a hand in structuring options and possibilities" (p. 1274). Additionally, Maniates (2001) pointed towards the potential for individualisation to distract from collective levels of engaging in change: "Individualization, by implying that any action beyond the private and the consumptive is irrelevant, insulates people from the empowering experiences and political lessons of *collective* struggle for social change …" (p. 44).

Conceptualisation of the individual

It has been argued that dominant neo-liberal thinking rests on a particular conceptualisation of the individual and society, where: "Society is reduced to the sum of rationally self-interested individual choices, each seeking to maximize short-term gain" (Webb, 2012, p. 111). The individual behaviour change approach sits comfortably within the idea of humans as rational information-processing decision makers (Seyfang, 2009). Any notions of structure, collective and interaction between people is pushed to the background. Thus, one issue with the individual behaviour change approach is that it locates the origin and solution to environmental degradation within the individual.

Feelings of helplessness

Returning to the example of the EPA mentioned at the outset, there is an apparent discrepancy between the level identified for the causes of climate change, such as energy production, deforestation, industrial processes (i.e. structural level factors) and the suggested actions of driving less and changing lightbulbs (individual level factors). Kahan (2012) proposed that individual action has little impact: "For members of the public, being right or wrong about climate-change science will have no impact. Nothing they do as individual consumers or as individual voters will meaningfully affect the risks posed by climate change" (p. 255). Not surprisingly, Norgaard (2011) noted feelings of helplessness in the public (in Norway and the USA) and discussed the role of emotions in the context of individualism. She quoted a student's frustration after

receiving information about climate change at a US University conference, while being left with inadequate suggestions for action:

> We'd hear all this information and get all riled up, and then they'd be, like, 'contact your legislator,' and I'd be, like, 'Aw, really? …' That's, like, where I feel the most helpless; it's like I know all this stuff, I have all this information, [but] what the hell do I do with it? … Yeah, I can write my congressman a letter, but in all honesty … I am not sure that one person can make such a difference. (Norgaard, 2011, p. 191)

Norgaard (2011) placed this in context by suggesting that: "… in the United States the general sense of helplessness that comes from facing such a large problem as climate change is exacerbated by the pervasive culture of individualism …" (p. 191) as well as a lack of insight into the workings of the political system and people's ability to actually effect change. Similarly, Kent (2009) summarised that feelings of helplessness are an important factor in explanations given for why people's stated values and actions do not necessarily seem to align: "… people feel that they lack the ability or sense of empowerment to undertake actions that will 'make the difference' on climate change." (Kent, 2009, p. 143). Therefore, in the present studies it was expected that information which highlights the lack of impact of individual behaviour change, will make individual behaviour change appear less beneficial and attractive. In contrast, structural level change may seem more beneficial and attractive, because it might be seen to have a more significant impact.

Diffusing responsibility

In contrast to claims that the framing of climate change as a collective responsibility diffuses responsibility and reduces the incentive for individual action (compared to framing it as individual responsibility) Obradovich and Guenther (2016) predicted the opposite. They looked at how highlighting the causes of climate change as either individual or collective responsibility affected donations towards supporting a wildlife conservation organisation's climate change efforts. They found that amongst members of the environmental organisation and amongst the public, those who were required to write about collective responsibility for climate change, were willing to donate significantly more money (if they were to win the prize draw) than were those in the individual responsibility and control conditions. Additionally, a follow up study with members of the general public showed that this effect persisted two days later. In another experiment the authors asked how likely participants were to reduce their own

climate change causing behaviours in the future and found that those in the collective responsibility condition showed higher intentions than those in the individual responsibility condition. These findings suggest that highlighting options for structural changes to climate change mitigation will not necessarily diffuse responsibility, but may even increase people's motivation to support change (in line with the collective responsibility framing).

The present research

The research reported here examined how the presentation of ways to reduce emissions influences support for structural level change. The extent to which a focus on individual behaviour change might attenuate support for structural level change was investigated.

Study 1

In one condition (*beneficial individual action*), participants were required to think about engaging in a list of eleven pro-environmental behaviours compared to not doing so (e.g., turning down the thermostat versus not turning down the thermostat). It was expected that presented with only two options (engaging in a pro-environmental action or not), participants would be encouraged to think of individual behaviour change in a positive light, because engaging in these behaviours would seem more favourable than not engaging in them. This is based on the idea that 'every little helps' and that small actions to reduce emissions are better than no action at all.

In the second condition (*action impact*) participants were required to think about the impact of the same eleven individual behaviours. Asking participants about the impact of one behaviour performed by one person was expected to highlight in people's minds the lack of impact that these behaviours might have and make their attitude towards these actions less favourable. Consequently, they were expected to view structural changes more favourably because such changes would appear to have a larger impact than would individual behaviour change.

The third condition involved no manipulation (*control*).

It was hypothesised that (1) participants in the *action impact* condition would be more supportive of prioritising the environment over the economy than would

participants in the *beneficial individual action* condition (because the former would be made more aware of the ineffectiveness of individual action and – consequently – they would be more supportive of the need for structural change);

(2) participants in the *action impact* condition would be more likely to attribute responsibility to structural level actors than would participants in the *beneficial individual action* condition (because the former would be more aware of the ineffectiveness of individual action and of the need for involvement of structural level actors);

(3) participants in the *beneficial individual action* condition would be more likely to support individual level responsibility than would participants in the *action impact* condition (because the former would be more aware of the benefits of citizens engaging in 'pro-environmental' behaviour changes);

(4) participants in the *action impact* condition would have higher intentions to engage in political action than would those in the *beneficial individual action* condition (because the former would be more aware of the need for political change).

Method

Participants

During a second year undergraduate Psychology practical class, 297[6] students (247 females, 50 males; age $M = 20.09$ years, $SD = 1.54$ years) participated in the study as part of their course. They were of diverse nationalities (210 British, five had dual nationality and 82 had other nationalities). All participants were naïve to the aims of the study.

Materials

Participants first completed an extended theory of planned behaviour questionnaire (predicting intentions to lead a lower carbon life)[7]. The results for that

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[6] Originally there were 298 participants, but the responses from one participant were excluded since the participant arrived late, while the rest of the class was already being debriefed.

[7] The questionnaire had a brief introduction, stating: "There is widespread consensus that the use of fossil fuels has contributed to global climate change. In the face of climate change many people have been thinking about how to lead lower carbon lives.

section of the questionnaire will be reported in a separate paper. The second part of the questionnaire consisted of an attentional focus manipulation (three conditions) followed by a series of dependent measures.

Attentional focus manipulation. *Beneficial individual action* condition ($n = 102$): In this condition participants were asked "Which one of each of the following pairs of behaviours is better for a person to engage in, in order to reduce climate change? (tick either 'A' or 'B' for each pairing)". Participants were then presented with eleven pairs of behaviours, e.g., "A. Turning down the thermostat where they live", "B. Not turning down the thermostat where they live".

Action impact condition ($n = 91$): In this condition, participants were asked eleven questions about the impact of the same pro-environmental behaviours as in the *beneficial individual action* condition, e.g., "If a person turns down their thermostat where they live, how much impact do you think that particular action will have in reducing climate change?". Response scale options ranged between "no impact at all" (1), "negligible impact" (2), "very little impact" (3), "little impact" (4), "a lot of impact" (5) and "a huge impact" (6). The scale was intentionally biased towards suggesting that individual action has little impact (four response options) rather than individual action having a lot of impact (two options). Additionally, the latter two response options were phrased strongly, so that participants were not provided with a middle ground option to suggest individual action has "some" impact. It was expected that with this response scale bias, participants would be more inclined to choose a statement indicating that individual behaviour change has little impact – the aim of this condition.

Control condition ($n = 104$): There was a control condition in which participants received no manipulation and were only required to complete the dependent variables.

Dependent variables. There were four dependent variables. Measures were constructed from the mean of the constituent items, except for one variable which

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This includes using less energy in the home, cutting down on transport that uses fossil fuels, buying fewer products or buying products that involve less energy use. Different people will prefer different ways of living a lower carbon life. And some people won't want to make any changes! What do you think about living a lower carbon life from now?"

consisted of only one item. All responses ranged from "Very strongly disagree" (1) to "Very strongly agree" (7) on Likert-type scales. Items were reverse coded as necessary.

Support for prioritising the environment ($\alpha = .83$). In order to assess participants' support for prioritising the environment, they were asked "To what extent do you agree or disagree with the following statements?", followed by seven statements about prioritising the environment, e.g., "Protection of the environment should be given priority, even at the risk of curbing economic growth", or "The government should introduce green taxes to discourage actions that harm the environment". One of these items was removed as it had low correlations with all other items (all *rs* < .36) and its removal increased overall scale reliability. Items for this scale were adapted from ICM poll questions and an article reported in the Guardian newspaper (Confino, 2014; Glover, 2008) and from Gallup poll questions (Jones, 2011; Swift, 2014).

Structural and individual level actors' responsibility. Participants were then asked "To what extent do you agree or disagree that the following should do more to reduce climate change?" They were presented with a list of five different actors: "The [UK government] should do more to reduce climate change" and the same question for corporations and industry, their member of parliament, their local council (*structural level actors' responsibility*, $\alpha = .89$) and individual citizens (*individual responsibility*). This scale was adapted from survey questions by Leiserowitz, Maibach, Roser-Renouf, Feinberg and Howe (2012).

Political action intentions ($\alpha = .89$). Participants were asked about their agreement or disagreement with six statements concerning their intentions to engage in a list of six actions addressing macro-level change, such as "I intend to take part in a protest or demonstration about an environmental issue". This measure was adapted from the Bain, Hornsey, Bongiorno and Jeffries (2012) scale of pro-environmental action.

Finally, participants reported their age, nationality and gender.

Design and Procedure

An online questionnaire study was employed. The online link randomly assigned participants to one of the three conditions. The independent variable was the attentional focus manipulation with three levels. At the beginning of the questionnaire, participants were asked for their consent and informed that they could withdraw at any point without

any further consequences. The study took approximately 10-15 minutes to complete. The study had ethical approval from the relevant Research Ethics Committee.

Results

Preliminary Analyses

To test for any systematic differences between conditions, the distributions of gender, age and nationality across conditions were examined. There was no significant association between condition and nationality[8], $\chi^2(2) = 0.13$, $p = .935$, Cramér's phi = .02, condition and gender, $\chi^2(2) = 0.06$, $p = .981$, Cramér's phi = .01, or between condition and age, $F(2, 294) = 0.54$, $p = .584$, $r = .06$.

In order to check the effectiveness of the manipulation in the *beneficial individual action* condition, the percentage of participants agreeing with each action was examined. This showed that most participants (> 75% for all actions) agreed that it is better for a person to engage in the action rather than not, in order to reduce climate change (table 1). For the *action impact* condition the distribution of answers showed that on average 75% agreed with one of the four responses indicating little impact, while 25.1% agreed with one of the two responses indicating larger impact (table 2).

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[8] A binary variable was created, with one group consisting of British and Irish participants and the other group consisting of all other nationalities, including those who indicated holding dual nationality.

Table 1. Percentage agreement in the *beneficial individual action* condition.

Which one of each of the following pairs of behaviours is better for a person to engage in, in order to reduce climate change?	Engage	Not engage
Turning down the thermostat where they live	98.0	2.0
Switching off appliances that aren't in use where they live	100.0	0.0
Switching to a renewable energy provider	99.0	1.0
Eating little or no meat	83.3	16.7
Eating few or no dairy products	75.5	24.5
Buying and cooking only what is needed to avoid food waste	100.0	0.0
Reusing, recycling, repairing or borrowing more often (rather than buying new)	100.0	0.0
Flying less often	95.1	4.9
Cycling more often	99.0	1.0
Taking public transport more often	88.2	11.8
Buying 'local' food more often	98.0	2.0

Table 2. Percentage agreement with how much impact each action will have in reducing climate change in the *action impact* condition.

How much impact do you think that particular action will have in reducing climate change?	No impact at all	Negligible impact	Very little impact	Little impact	A lot of impact	A huge impact
If a person turns down their thermostat where they live	4.4	29.7	25.3	31.9	8.8	0.0
If a person switches off appliances that aren't in use where they live	4.4	19.8	29.7	31.9	14.3	0.0
If a person switches to a renewable energy provider where they live	2.2	7.7	14.3	40.7	30.8	4.4
If a person eats little or no meat from now on	12.1	25.3	18.7	27.5	13.2	3.3
If a person eats few or no dairy products from now on	13.2	29.7	20.9	25.3	9.9	1.1
If a person buys and cooks only what is needed to avoid food waste from now on	6.6	15.4	16.5	34.1	23.1	4.4
If a person reuses, recycles, repairs or borrows more often (rather than buying new) from now on	0.0	7.7	14.3	40.7	27.5	9.9
If a person flies less often from now on	3.3	17.6	9.9	36.3	30.8	2.2
If a person cycles more often from now on	3.3	4.4	17.6	39.6	34.1	1.1
If a person takes public transport more often from now on	4.4	7.7	17.6	39.6	27.5	3.3
If a person buys 'local' food more often from now on	5.5	11.0	27.5	29.7	22.0	4.4

A one-way ANOVA revealed a marginal effect of condition on *support for prioritising the environment*, $F(2, 294) = 2.32$, $p = .100$, $r = .12$.[9] The planned contrast indicated that participants in the *action impact* condition showed significantly higher support ($M = 5.08$, $SD = 0.84$) than did participants in the *beneficial individual action* condition ($M = 4.82$, $SD = 0.98$), $t(294) = 2.05$, $p = .042$, $r = .12$[10] (table 3). This supports Hypothesis 1.

Since there was no a priori prediction regarding the difference between the control and experimental groups, a post-hoc test was employed. Tukey's HSD post-hoc test revealed no significant difference between either the *control* and *beneficial individual action* condition ($p = .254$), or between the *control* and *action impact* condition ($p = .862$, *control M* $= 5.02$, $SD = 0.85$).

A one-way ANOVA on *structural level actors' responsibility* showed no significant overall effect, $F(2, 294) = 1.95$, $p = .145$, $r = .11$. The planned contrast showed that participants in the *action impact* condition indicated marginally higher agreement with *structural level actors' responsibility* ($M = 5.79$, $SD = 0.70$), than did participants in the *beneficial individual action* condition ($M = 5.59$, $SD = 0.83$), $t(294) = -1.92$, $p = .056$, $r = .11$[11]. This supports Hypothesis 2.

A one-way ANOVA on support for *individual responsibility*, showed no significant overall effect, $F(2, 294) = 0.76$, $p = .469$, $r = .07$. Further, the planned

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[9] The planned contrasts were conducted despite the overall F only being marginally significant, as Howell (1997) argued that follow-up tests and their significance levels were established without regard to the overall F and are thus adequate for comparing between group differences.

[10] For *support for prioritising the environment* there was significant skew and kurtosis in the *beneficial individual action* condition, skewness $z = -3.14$, $p = .002$, kurtosis $z = 2.82$, $p = .005$. Because transforming data can also be problematic and the F-ratio is a robust test (Field, 2009), it was decided not to transform the data. A Kruskal-Wallis test did not mirror precisely the ANOVA results, as there was no overall marginally significant effect between conditions, $H(2) = 2.71$, $p = .259$. However, the Mann-Whitney test supported the t-test results, showing a marginally significant difference (1-tailed) between the experimental conditions, $U = 5254.50$, $p = .057$.

[11] There was significant skew and kurtosis in the *beneficial individual action* condition for *structural level actors' responsibility*, skewness $z = -5.06$, $p < .001$, kurtosis $z = 6.60$, $p < .001$. The Kruskal-Wallis test confirmed the ANOVA results, showing no significant overall effect of condition, $H(2) = 2.383$, $p = .304$. Further, the Mann-Whitney test supported the t-test results, showing a marginally significant difference (1-tailed) between the experimental conditions, $U = 5226.00$, $p = .064$.

contrast revealed no significant difference between the two experimental conditions, $t(294) = -1.11$, $p = .268$, $r = .06$[12], (*beneficial individual action M = 5.76, SD = 0.94, action impact M = 5.91, SD = 0.87*). This does not support Hypothesis 3.

Finally, a one-way ANOVA revealed no overall effect on *political action intentions, F*(2, 191.04) = .35, $p = .704$[13], $r = .05$. The planned contrast showed no significant difference between the two experimental conditions, $t(190.14) = 0.69$, $p = .494$, $r = .05$, (*beneficial individual action M = 3.90, SD = 1.24, action impact M = 4.02, SD = 1.18*). This does not support Hypothesis 4.

Table 3. Means and Standard Deviations (in parentheses) by condition for each dependent variable.

	Beneficial individual action	Action impact	Control
Support for prioritising the environment	4.82 (0.98)	5.08 (0.84)	5.02 (0.85)
Structural level actors' responsibility	5.59 (0.83)	5.79 (0.70)	5.73 (0.72)
Individual responsibility	5.76 (0.94)	5.91 (0.87)	5.89 (0.95)
Political action intentions	3.90 (1.24)	4.02 (1.18)	3.89 (1.00)

[12] There was significant skew in all three conditions for *individual responsibility*, in the *control* condition, skewness $z = -2.84$, $p = .005$; in the *beneficial individual action* condition, skewness $z = -4.15$, $p < .001$; and in the *action impact* condition, skewness $z = -3.07$, $p = .002$. There was also significant kurtosis in the *beneficial individual action* condition for the same variable, kurtosis $z = 6.60$, $p < .001$. The Kruskal-Wallis test confirmed the ANOVA results, showing no significant overall effect of condition, $H(2) = 1.71$, $p = .424$. Additionally, the Mann-Whitney test confirmed the t-test results, showing no significant difference (1-tailed) between the experimental conditions, $U = 5074.50$, $p = .115$.

[13] Welch's F-ratio is reported as Levene's test was significant showing that homogeneity of variance was violated $F(2, 294) = 3.13$, $p = .045$.

Correlations between manipulation task responses and dependent variables

Correlation analyses were conducted in order to examine the relationship between participants' score on the manipulation task and their response to the dependent variables.

For the *beneficial individual action* condition the sum of each participant's agreement that engaging in the individual behaviour change is better than not doing so, was calculated. A higher score indicated a higher number of choices that engaging in the actions was better to reduce climate change than not engaging in them. There was a significant positive correlation between participants' total *beneficial individual action* score and each dependent variable, as follows: *support for prioritising the environment*, $r = .34$, $p < .001$, *structural level actors' responsibility*, $r = .36$, $p < .001$, *individual responsibility*, $r = .28$, $p = .005$, *political action intentions*, $r = .28$, $p = .005$. This suggests that the more participants chose options that were better for a person to engage in to reduce climate change, the more supportive they were of individual and structural level change.

For the participants in the *action impact* condition, the sum of their responses was calculated to obtain a total impact score. The higher their score the more they agreed that the behaviour changes would have an impact in reducing climate change. This score was then correlated with each dependent variable. The total impact score correlated significantly with *support for prioritising the environment*, $r = .27$, $p = .011$, marginally with agreement on s*tructural level actors' responsibility*, $r = .19$, $p = .065$, significantly with support for *individual responsibility*, $r = .26$, $p = .012$, and significantly with *political action intentions*, $r = .48$, $p < .001$. Contrary to the expectation that participants in the *action impact* condition would be reminded of the ineffectiveness of individual actions, the correlations suggest that it was in fact those participants who believed more strongly that individual behaviour change has an impact, who were more supportive of all kinds of changes. This indicates that the difference between the experimental conditions which was found on *support for prioritising the environment* and *structural level actors' responsibility* might have been driven by participants' high belief in the effectiveness of individual action in the *action impact* condition. Participants in the *action impact* condition were significantly more supportive of prioritising the environment and marginally more in favour of *structural level actors' responsibility*, than were participants in the *beneficial individual action*

condition. Something about making salient the impact of individual action (contrary to the intended manipulation effect of highlighting the lack of impact) seems to have influenced support for prioritising the environment and for the responsibility of structural level actors. This was relative to participants who were presented with the option of indicating whether it is better for a person to engage in individual behaviour change than not doing so.

Discussion

In line with the first hypothesis, the findings showed that participants encouraged to think about the impact of individual actions (*action impact*) were significantly more in favour of prioritising the environment than were participants required to think about engaging in individual actions compared to not doing so (*beneficial individual action*). Consistent with the second hypothesis, participants in the *action impact* condition were also marginally more supportive of *structural level actors' responsibility* than were participants in the *beneficial individual action* condition. Contrary to the third and fourth hypotheses, there was neither a significant difference between the two experimental conditions on support for *individual responsibility* nor on *political action intentions*.

However, unpacking the direction of the effects within each condition showed that the manipulation did not have the intended effect in the *action impact* condition. Rather than highlighting to participants the ineffectiveness of individual behaviour change, participants might have been nudged to consider the positive impact of individual actions. This suggestion is in line with the correlations showing that participants who believed more strongly in the impact of individual behaviour change (than those who indicated a lower impact) were significantly more supportive of prioritising the environment, scored marginally higher on *structural level actors' responsibility*, scored significantly higher on *individual responsibility* and scored significantly higher on *political action intentions*. For the *beneficial individual action* condition, participants who agreed more often that it is better for a person to engage in behaviour change to reduce climate change (than not doing so) agreed significantly more with prioritising the environment, individual and structural level actors' responsibility and showed higher *political action intentions*. It seems that people with higher compared to lower individual impact scores were driving the difference

between the two experimental conditions. One possible explanation for these findings could be that those who were overall more supportive of climate change mitigation were simply more in favour of all kinds of action, i.e. they believed in the impact of individual behaviour change, as well as being supportive of structural level change.

Distribution of support for different kinds of individual level actions

The pattern of responses in both experimental conditions is noteworthy. Somewhat surprising is the prevalence and distribution of beliefs in a relatively high impact of individual behaviour changes. For example, in the *action impact* condition, 'reusing and recycling' received the highest percentage of agreement that it would have a huge impact, compared to a lower percentage of agreement that a person flying less would have a huge impact in reducing climate change. Further, in the *beneficial individual action* condition, 'reducing dairy and meat consumption' received the least support as actions to reduce climate change, despite meat and dairy consumption's important contribution to greenhouse gas emissions (Eshel, Shepon, Makov & Milo, 2014). Graça, Calheiros and Oliveira (2014) suggested that various moral disengagement strategies were involved in maintaining the practice of meat consumption. The present findings could be taken to suggest that people are not quite aware of the kinds of factors and behaviours driving greenhouse gas emissions. Whitmarsh (2009) found that less than a third of participants took action because of concern over climate change. Amongst those who did, the most popular action was recycling, rather than direct energy conservation behaviours. Consistent with the notion of the social organisation of attention (Zerubavel, 2006) these findings might be related to a possible greater emphasis placed on recycling in attempts to encourage individual behaviour change.

One of the limitations of this study is that the *action impact* manipulation was not successful in inducing participants to view individual behaviour change as ineffective. Similarly, the *beneficial individual action* manipulation might also have been unsuccessful in making individual behaviour change seem more positive. Further, the wording in the *action impact* condition might not have been clear about whether it referred to just one person engaging in the action once, or whether it referred to a lot of people engaging in the action (that is, some participants might have given higher impact

ratings because they interpreted the question as relating to a lot of people engaging regularly in the action).

Study 2

Given that the manipulation in Study 1 did not have the intended effect of encouraging participants to view individual behaviour change as ineffective (in the *action impact* condition), a more straightforward manipulation was used in Study 2, making use of the provision of 'information'. The rationale behind Study 2 was similar to that in Study 1, only that in Study 2 participants in the experimental conditions were presented with a short paragraph arguing either for a *large impact* or *very little impact* of individual behaviour change on reducing climate change. There was also a control condition with no manipulation text. Further, some additional dependent variables were introduced, in order to further examine the effect of the manipulation on e.g., support for government intervention. It was predicted that participants in the *very little impact* condition (compared to participants in the *large impact* condition) would be more supportive of government intervention, more supportive of economic and political change, in stronger agreement on the intersection between environmental and social well-being, more supportive of prioritising the environment, more in favour of structural level actors' responsibility, less supportive of individual citizens' responsibility, higher in political action intentions and lower in individual behaviour change intentions.

Method

Participants

First year Psychology undergraduate students took part in return for course credits. After excluding nine participants who completed the study twice, 153 (121 females, 31 males, 1 other; age $M = 19.75$. years, $SD = 5.33$ years) participants remained. All participants were unaware of the aims of the study.

Materials

Participants were provided with general information about what the study involved and asked for their consent. Initially, they reported their age, name and e-mail address.

Information manipulation. Depending on condition, a short paragraph was presented suggesting that individual behaviour changes have a *large impact* or *very little impact* in reducing national greenhouse gas emissions or participants were provided with no information (*control*).

Large impact (*n* = 60): "There are many ways in which people can help reduce climate change, for example by recycling, turning down their thermostat, driving and flying less and buying local food produce. These behaviour changes have been shown to have a large impact in reducing national greenhouse gas emissions."

Very little impact (*n* = 46): "There aren't many ways in which people can help reduce climate change, it is not as simple as recycling, turning down their thermostat, driving and flying less and buying local food produce. These behaviour changes have been shown to have very little impact in reducing national greenhouse gas emissions."

Control (*n* = 47): No text was provided.

Participants were asked to confirm whether or not they had read the text carefully and were informed that they would be asked questions relating to the short paragraph that had been presented to them.

Dependent Variables. There were eight dependent variables. Participants were asked to what extent they agreed with a set of statements; responses were measured on a seven point Likert-scale ranging from *very strongly disagree* (1) to *very strongly agree* (7). Measures were constructed from the means of the constituent items. Items were reverse-coded where necessary.

Support for government intervention (α = .75). Participants were asked about their support for thirteen governmental measures in the UK aimed at reducing greenhouse gas emissions, for example "Increased government spending on improving public transport within towns and cities". Higher scores indicated stronger support for government level change.

Support for economic and political change (α = .81). This scale consisted of five items measuring support for economic and political change to address climate change, e.g., "I believe the economic system needs to change in order to reduce climate change".

Intersection between environmental and social well-being (α = .65). Four statements measured participants' agreement about the connection between

environmental, economic and social issues, e.g., "I believe that economic, social and environmental problems can be addressed together".

Support for prioritising the environment (α = .84). The same scale as in Study 1 was employed. One item was removed due to low correlations with all other items and because its removal increased the overall alpha.

Structural and individual level actors' responsibility. The same items as in Study 1 were used with several items relating to *structural level actors' responsibility* (α = .86) and one item assessing *individual responsibility.*

Political action intentions (α = .84). The same scale as in Study 1 was used.

Individual behaviour change intentions (α = .79). Twelve statements were presented relating to participants' intentions to engage in individual behaviour change, e.g., "I intend to improve the insulation where I live".

Participants were then asked whether the information they had received at the beginning of the questionnaire stated that people's behaviour change had a *large impact* or a *very little impact* in reducing national greenhouse gas emissions, and to what extent they agreed with the statement they had received. Finally participants recorded their gender and nationality.

Design and Procedure

Participants signed up to the online study through a Psychology recruitment database and followed a link which randomly allocated them to one of the three conditions. The study took approximately 15 minutes to complete. The independent variable was the information factor with three levels. Participants took part in their own time from wherever they had access to the internet. The study had ethical approval from the relevant Research Ethics Committee.

Results

To examine whether there were any systematic differences between conditions, chi-square tests (on gender and nationality) and an ANOVA (on age) were conducted. There was no significant association between either condition and gender χ^2 (2) = 0.11, p = .967, Cramér's phi = .03, condition and nationality (British and Irish compared to all

other nationalities or dual nationalities) χ^2 (2) = 1.88, p = .398, Cramér's phi = .11, or condition and age, $F(2, 150)$ = 0.30, p = .739, r = .06.

One-way ANOVAs were conducted for each dependent variable to examine if there were any differences between conditions. There was no significant overall effect for any of the dependent variables: *support for government intervention*, $F(2, 150)$ = 0.08, p = .920, r = .03, *support for economic and political change*, $F(2, 150)$ = 0.42, p = .659, r = .07[14], *intersection between environmental and social well-being*, $F(2, 150)$ = 0.26, p = .774, r = .06, *support for prioritising the environment*, $F(2, 150)$ = 1.86, p = .159, r = .16, *structural level actors' responsibility*, $F(2, 150)$ = 0.47, p = .624, r = .08[15], *individual responsibility*, $F(2, 150)$ = 0.44, p = .643, r = .08[16], *political action intentions*, $F(2, 150)$ = 0.28, p = .754, r = .06, *individual behaviour change intentions*, $F(2, 150)$ = 0.51, p = .603, r = .08. Further, planned contrasts between the two experimental conditions and post-hoc tests revealed no significant differences (all *ps* > .05, see table 4 for all means and standard deviations).[17]

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[14] For *support for economic and political change* there was significant kurtosis in the *very little impact* condition, kurtosis z = 1.96, p = .050. A Kruskal-Wallis test confirmed the ANOVA results, showing no significant overall effect of condition, $H(2)$ = 0.34, p = .845. Further, the Mann-Whitney test confirmed the t-test results, revealing no significant difference (1-tailed) between the experimental conditions, U = 1425.00, p = .387.

[15] For *structural level actors' responsibility* there was significant skew and kurtosis in the *very little impact* condition, skewness z = -7.05, p < .001, kurtosis z = 16.31, p < .001 and in the *control* condition, skewness z = -2.35, p = .019, kurtosis z = 2.91, p = .004. A Kruskal-Wallis test confirmed the ANOVA results, showing no significant overall effect of condition, $H(2)$ = 1.42, p = .492. The Mann-Whitney test also confirmed the t-test findings, revealing no significant difference (1-tailed) between the experimental conditions, U = 1378.00, p = .495.

[16] There was significant skew and kurtosis for *individual responsibility* in the *very little impact* condition, skewness z = -6.02, p < .001, kurtosis z = 9.89, p < .001, and in the *control* condition, skewness z = -3.12, p = .002, kurtosis z = 2.33, p = .020. A Kruskal-Wallis test confirmed the ANOVA results, showing no significant overall effect between conditions, $H(2)$ = 0.09, p = .956. A Mann-Whitney test also confirmed the t-test results, showing no significant difference (1-tailed) between the experimental conditions, U = 1339.50, p = .389.

[17] At the end of the questionnaire participants were asked what the text stated which they had read at the beginning. A new data set was created excluding those participants who did not correctly identify which condition they were in (excluding n = 20). When the analyses were conducted on this data set the overall pattern was similar, in that there were no significant differences between conditions for most of the dependent variables. Only the *support for prioritising the environment* variable was marginally significant

Table 4. Means and Standard Deviations (in parentheses) by condition for each dependent variable.

	Large impact	Very little impact	Control
Support for government intervention	4.76 (0.62)	4.74 (0.51)	4.79 (0.67)
Support for economic and political change	5.07 (0.88)	5.18 (0.99)	5.01 (0.87)
Intersection between environmental and social well-being	4.67 (0.84)	4.68 (0.96)	4.78 (0.84)
Support for prioritising the environment	5.03 (0.95)	5.28 (0.88)	4.94 (0.80)
Structural level actors' responsibility	5.75 (0.68)	5.70 (0.98)	5.60 (0.75)
Individual responsibility	6.08 (0.70)	5.91 (1.15)	5.98 (0.99)
Political action intentions	4.05 (1.04)	4.19 (0.97)	4.05 (1.08)
Individual behaviour change intentions	4.71 (0.79)	4.87 (0.72)	4.79 (0.84)

To examine the extent of participants' agreement with their respective manipulation text, a t-test was conducted, which showed that participants in the *large impact* condition ($M = 5.27$, $SD = 1.55$) agreed significantly more with their text, than did those in the *very little impact* condition ($M = 3.04$, $SD = 1.53$), $t(104) = 7.35$, $p < .001$, $r = .58$[18]. Table 5 displays the distribution of level of agreement with each text.

F(2, 130) = 2.49, *p* = .087, *r* = .19. The planned contrast between the experimental conditions was not significant *t*(130) = -1.02, *p* = .310, but Tukey's HSD post-hoc test showed a marginally significant difference between the *very little impact* condition and the *control* condition, mean difference = 0.41, *p* = .072. Participants in the *very little impact* condition (*M* = 5.34, *SD* = 0.84) were more supportive of prioritising the environment over the economy than were those in the *control* condition (*M* = 4.94, *SD* = 0.80), while the *large impact* condition lay in between the two (*M* = 5.16, *SD* = 0.87).

[18] There was significant skew and kurtosis in the *large impact* condition on level of agreement with the manipulation statement, skewness *z* = -4.88, *p* < .001, kurtosis *z* =

Table 5. Percentage agreement with the manipulation statement for each experimental condition.

	Large impact (n = 60)	Very little impact (n = 46)
Very strongly disagree	5.0	17.4
Strongly disagree	5.0	19.6
Slightly disagree	5.0	32.6
Neither disagree nor agree	0.0	13.0
Slightly agree	26.7	8.7
Strongly agree	45.0	6.5
Very strongly agree	13.3	2.2

Correlations were conducted for each condition separately, in order to examine the relationship between participants' agreement with the statement in their respective condition and their scores on each dependent variable. For the *large impact* condition, there was one significant correlation: between level of agreement with the manipulation statement and agreement with the *intersection between environmental and social well-being* measure, $r = .27$, $p = .034$, whereby participants who agreed more strongly that individual behaviour change has a large impact, agreed more strongly with the connection between environmental and social issues. For the *very little impact* condition there was a marginally significant negative correlation between agreement with the manipulation statement and support for prioritising the environment, $r = -.26$, $p = .082$, whereby participants who agreed more strongly that individual behaviour change has very little impact, agreed less that the environment should be prioritised over the economy. Further, the more participants agreed that individual behaviour change has little impact, the less they agreed that it is *structural level actors' responsibility* to do more, $r = -.34$, $p = .022$. The stronger participants agreed that individual behaviour

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2.80, $p = .005$. A Mann-Whitney test confirmed the t-test results, showing a significant difference (1-tailed) between the experimental conditions, $U = 458.50$, $p < .001$.

change has very little impact, the less they agreed that individual citizens should do more to reduce climate change, $r = -.51$, $p < .001$. Participants who agreed more that individual behaviour change has little impact, scored lower on intentions to engage in individual behaviour change, $r = -.35$, $p = .017$. All other correlations were non-significant (all ps > .05).

Discussion

There were no significant differences between conditions on any of the dependent variables, showing no support for the hypothesis that people in the *large impact* of individual action condition would be less supportive of structural level change. There was a significant difference between conditions on agreement with the manipulation statement, whereby participants in the *large impact* condition showed higher agreement than those in the *very little impact* condition. The latter finding is noteworthy in itself as it suggests that individual actions were viewed as having a crucial impact in reducing climate change. It is possible that participants in the *very little impact* condition were not convinced by their manipulation statement (as they showed less agreement with the statement). These findings might indicate how pervasive the idea is that individual behaviour change can make a difference.

Correlation analyses were conducted in order to unpack the relationship between level of agreement with the manipulation statement and each dependent variable within each condition. Contrary to the hypotheses that participants presented with information arguing that individual behaviour change has very little impact would overall be more supportive of structural level change, the correlations tended to show the opposite pattern.

It may be more effective to contrast a positive message about individual behaviour change with a positive message concerning structural level change, in order to contrast two positive framings and present an alternative to individual behaviour change, rather than just attempting to raise doubts about the effectiveness of individual behaviour change.

Study 3

Study 3 compared the presentation of information in support of structural level change to the presentation of information in support of individual behaviour change.

Can information arguing for structural level change to mitigate climate change lead to higher support for structural level change, relative to information that is favourable towards individual behaviour change? It was predicted that participants receiving a text that is positive about structural level change would be more supportive of structural change, than would those reading a text that is positive about individual behaviour change. Many of the same dependent variables were used from Study 2. It was hypothesised that participants receiving information in favour of structural level change (compared to those receiving information in favour of individual behaviour change) would be more supportive of government intervention, more supportive of prioritising the environment, show higher agreement with structural level actors' responsibility, show lower agreement with individual responsibility, be more supportive of economic and political change, score higher in political action intentions and lower in individual behaviour change intentions.

Method

Participants

Second year undergraduate students ($N = 264$) participated in the study as part of a Social Psychology module (213 females, 49 males, 2 other; age $M = 20.41$ years, $SD = 2.70$ years). They were unaware of the aims of the study.

Materials

Participants were informed about what the study involved and asked for their consent. They were asked for demographic information, including their gender, age and nationality.

Information manipulation. Participants were presented with information suggesting either that people's pro-environmental behaviour (*individual action*) or that structural level change (*structural change*) is crucial in making the difference to reducing climate change, or they received no information (*control*).

Individual action ($n = 94$): "Climate researchers maintain that people engaging in pro-environmental actions is crucial in making the difference to reducing climate change. These kinds of actions include recycling, turning down thermostats and switching off unused devices, using less electricity, eating less meat, and flying and

driving less. For example, figures show that 8% of the total electricity used in UK homes comes from appliances left on standby, which is the equivalent of around two power stations' worth of electricity each year."[19]

Structural change (*n* = 85): "Climate researchers maintain that structural changes are crucial in making the difference to reducing climate change. These kinds of transformations include government investment in renewable energy production while reducing fossil fuel extraction, cheaper and improved public transport and funding for insulated housing. For example, for the first time this summer renewables made up over a quarter of the UK's power mix. All the clean technology being built meant renewables became the second largest electricity source."[20]

Control (n = 85): Participants received no text.

Participants were asked to confirm that they had read the text (yes/no) and notified that they would be asked questions in relation to the text.

Dependent variables. The questionnaire had seven dependent variables. Participants indicated their level of agreement with a variety of statements on seven point Likert-scales, with responses ranging from *very strongly disagree/oppose* (1) to *very strongly agree/support* (7). Measures were constructed from the means of the constituent items and items were reverse coded as necessary.

Support for government intervention (α = .71). A similar scale as in Study 2 was employed, except that five repetitive items were removed to make the measure more concise.

Support for prioritising the environment (α = .82). This was the same measure that was used in Studies 1 and 2 (except that the item which was removed from the analyses in the previous studies due to low correlations, was excluded from the measure from the start).

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[19] The last sentence of the manipulation text in the *individual action* condition was based on information provided by Aldred (2007, referring to figures from the Energy Saving Trust).

[20] The last sentence for the *structural change* manipulation text was based on information provided by the campaign group Ten Ten (n.d.).

Structural and individual level actors' responsibility. The same measures as in Studies 1 and 2 were used (*structural level actors' responsibility*, α = .79). One item measured *individual responsibility*.

Support for economic and political change (α = .75). The same measure as in Study 2 was used.

Political action intentions (α = .86). The same measure as in Studies 1 and 2 was used.

Individual behaviour change intentions (α = .77). The same measure as in Study 2 was used.

Participants were then asked to what extent they agreed or disagreed with the text that they had received in their respective conditions. The text was reproduced for them.

Design and Procedure

The study took place during the students' practical class in which they completed an online questionnaire. Participants were asked to follow a link which randomly allocated them to one of the three conditions. The study took approximately 15 minutes to complete. The independent variable was the information manipulation with three levels. The study received ethical approval from the relevant Research Ethics Committee.

Results

Preliminary analyses were conducted to see whether there were any systematic differences between conditions. There were no significant associations between condition and gender, $\chi^2 (4) = 2.56$, p = .635, Cramér's phi = .07, between condition and nationality (British and Irish compared to all other nationalities, including dual nationalities), $\chi^2 (2) = 1.87$, $p = .393$, Cramér's phi = .08, or between condition and age, $F(2, 150) = 0.30$, $p = .739$, $r = .06$. A series of one-way ANOVAs was carried out to examine the overall effect of condition on the dependent variables.

There was no overall significant effect of condition on *support for government intervention*, $F(2, 261) = 0.57$, $p = .566$, $r = .07$. There was also no significant difference between the experimental groups, $t(261) = 0.98$, $p = .330$, $r = .06$. Tukey's

HSD post-hoc test revealed no significant differences between the control and either of the experimental conditions ($p > .05$, see table 6 for all means and standard deviations).

There was a marginally significant overall effect of condition on *support for prioritising the environment*, $F(2, 261) = 2.38$, $p = .094$, $r = .13$. The planned contrast between experimental conditions showed a significant difference, $t(261) = 2.16$, $p = .032$, $r = .13$[21], whereby participants in the *individual action* condition ($M = 5.43$, $SD = 0.85$) agreed more that the environment should be prioritised over the economy than did those in the *structural change* condition ($M = 5.15$, $SD = 0.89$). This is contrary to the expectation for Hypothesis 2. Tukey's HSD post-hoc test showed no significant difference between the experimental and control conditions ($p > .05$).

There was a marginally significant overall effect of condition on agreement with *structural level actors' responsibility*, $F(2, 168.33) = 2.36$, $p = .097$[22], $r = .13$. The planned contrast showed no significant difference between the experimental conditions, $t(163.10) = 1.57$, $p = .119$, $r = .12$. Tukey's HSD post-hoc test revealed no significant difference between the control and experimental conditions ($p > .05$).

There was a significant overall effect of condition on agreement with *individual responsibility*, $F(2, 261) = 4.18$, $p = .016$, $r = .18$. The planned contrast showed no significant difference between the two experimental conditions, $t(261) = 0.56$, $p = .579$, $r = .03$[23]. Tukey's HSD post-hoc test showed a significant difference between the *individual action* and *control* condition, mean difference = 0.29, $p = .017$, whereby people in the *individual action* condition ($M = 6.33$, $SD = 0.63$) agreed more strongly that individual citizens should do more to reduce climate change, than did those in the

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[21] The data were significantly skewed in the *individual action* condition for *support for prioritising the environment*, skewness $z = -1.98$, $p = .048$. A Kruskal-Wallis test confirmed the results from the ANOVA, showing a marginally significant overall effect of condition, $H(2) = 5.71$, $p = .058$. Further, a Mann-Whitney test confirmed the t-test results, showing a significant difference (1-tailed) between the two experimental conditions, $U = 3195.50$, $p = .011$.

[22] Levene's test was significant showing that homogeneity of variance was violated $F(2, 261) = 3.83$, $p = .023$, so Welch's F-ratio was used.

[23] There was significant skew and kurtosis for *individual responsibility* in the *structural change* condition, skewness $z = -4.81$, $p < .001$, kurtosis $z = 7.55$, $p < .001$. The Kruskal-Wallis test confirmed the ANOVA results, showing an overall significant effect of condition, $H(2) = 6.95$, $p = .031$. Further, the Mann-Whitney test confirmed the t-test results, showing no significant difference (1-tailed) between the experimental conditions, $U = 3872.50$, $p = .347$.

control condition (*M* = 6.04, *SD* = 0.79). There was also a marginally significant difference between the *structural action* and *control* condition, mean difference = 0.24, *p* = .081, with participants in the *structural action* condition (*M* = 6.27, *SD* = 0.71) agreeing more strongly that individual citizens should do more to reduce climate change, than did participants in the *control* condition.

There was no significant overall effect of condition on *support for economic and political change*, *F*(2, 261) = 1.64, *p* = .197, *r* = .11. There was no significant difference between the experimental conditions, *t*(261) = .07, *p* = .947, *r* = .004[24], or between the control and experimental conditions (*p* > .05).

There was no significant overall effect of condition on *political action intentions*, *F*(2, 261) = 0.19, *p* = .827, *r* = .04. The planned contrast showed no significant difference between the two experimental conditions, *t*(261) = .584, *p* = .560, *r* = .04. The post-hoc test revealed no difference between the control and experimental conditions (*p* > .05).

There was no significant overall effect of condition on *individual behaviour change intentions*, *F*(2, 261) = 1.18, *p* = .308, *r* = .09. There was no significant difference between the experimental conditions, *t*(261) = 1.44, *p* = .151, *r* = .09, nor between the control and experimental conditions (*p* > .05).

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[24] The data showed significant kurtosis for *support for economic and political change* in the *individual action* condition, kurtosis *z* = -2.03, *p* = .042 and in the *control* condition, kurtosis *z* = 2.56, *p* = .010. A Kruskal-Wallis test confirmed the results from the ANOVA, revealing no overall significant effect of condition, *H*(2) = 2.75, *p* = .253. Additionally, a Mann-Whitney test supported the t-test results, showing no significant difference (1-tailed) between the two experimental conditions, *U* = 3885.50, *p* = .376.

Table 6. Means and Standard Deviations (in parentheses) by condition for each dependent variable.

	Individual action	Structural change	Control
Support for government intervention	4.95 (0.59)	4.85 (0.77)	4.87 (0.67)
Support for prioritising the environment	5.43 (0.85)	5.15 (0.89)	5.26 (0.80)
Structural level actors' responsibility	6.03 (0.55)	5.88 (0.67)	5.84 (0.70)
Individual responsibility	6.33 (0.63)	6.27 (0.71)	6.04 (0.79)
Support for economic and political change	5.12 (0.77)	5.12 (0.84)	4.92 (0.84)
Political action intentions	4.27 (1.12)	4.18 (1.11)	4.20 (1.01)
Individual behaviour change intentions	4.79 (0.81)	4.62 (0.82)	4.76 (0.77)

An independent samples t-test showed no significant difference between the two experimental conditions on level of agreement with the manipulation text in the respective conditions, $t(177) = 1.10$, $p = .271$, $r = .08$[25] (*individual action M* = 5.63, *SD* = 1.06, *structural change M* = 5.46, *SD* = 0.98).

In order to examine the relationship between participants' agreement with the text in their respective condition and their responses to each independent variable, correlations were conducted separately for each condition.

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[25] There was significant skew and kurtosis in the *individual action* condition for level of agreement with the manipulation text, skewness $z = -5.06$, $p < .001$, kurtosis $z = 4.55$, $p < .001$. A Mann-Whitney test did not mirror precisely the t-test results, showing a marginally significant difference (1-tailed) between the two experimental conditions, $U = 3511.50$, $p = .069$.

In the *individual action* condition there was a marginally significant positive correlation between participants' agreement with the manipulation text and *support for prioritising the environment*, $r = .18$, $p = .090$, whereby participants who agreed more that individual action is crucial in making the difference to reducing climate change, were more supportive of prioritising the environment. Further, a significant positive correlation showed that participants who agreed more with the manipulation text, also agreed more with *structural level actors' responsibility*, $r = .25$, $p = .014$. The more participants agreed with the manipulation text, the more they agreed with *individual responsibility*, $r = .33$, $p = .001$. Participants who agreed more with the text, also showed higher *political action intentions*, $r = .27$, $p = .008$. Finally, those who agreed more with the manipulation text, showed higher *individual behaviour change intentions*, $r = .26$, $p = .013$. All other correlations were non-significant (all ps > .05).

For the *structural change* condition there was a significant positive correlation between agreement with the text and all dependent variables, except for the two items that related to individual responsibility and individual behaviour change intentions. Those who agreed more with the text, scored higher on *support for government intervention*, $r = .23$, $p = .035$; *support for prioritising the environment*, $r = .26$, $p = .017$; *structural level actors' responsibility*, $r = .24$, $p = .029$; *support for economic and political change*, $r = .37$, $p = .001$; *political action intentions*, $r = .26$, $p = .018$. In contrast, the correlation between agreement with the manipulation text and *individual behaviour change intentions*, $r = .18$, $p = .097$ was marginal and there was no significant correlation with agreement on *individual responsibility*, $r = .008$, $p = .945$.

Discussion

This study demonstrated a marginally significant difference between conditions on *support for prioritising the environment*, with higher agreement that the environment should be prioritised over the economy in the *individual action* condition than in the *structural change* condition (contrary to Hypothesis 2). The only other significant differences were between the control and both experimental conditions. Participants in the *individual action* and the *structural change* condition (although for the latter the difference was marginal), showed higher agreement that individual citizens should do more to reduce climate change, than did those in the *control* condition. It is notable that participants in both experimental conditions agreed generally that individual citizens

should do more to reduce climate change, but did not score significantly higher than participants in the *control* condition on the intention to engage in political action or individual behaviour change.

It is also noteworthy that participants in the *structural change* condition agreed more strongly on *individual responsibility* compared to the *control* condition. This may suggest that the manipulations had an effect on support for individual action on climate change irrespective of which level of intervention was suggested in the text. It could be that participants required to think about climate change mitigation strategies simply became more supportive of any kind of action and did not distinguish between individual and structural levels.

General Discussion

In Study 1 participants in the *action impact* condition were more supportive of prioritising the environment and marginally more in favour of structural level actors doing more to reduce climate change, than were those in the *beneficial individual action* condition. The correlations indicated that this difference might have been driven by participants with higher impact scores, as they scored higher on the dependent variables. The correlations showed that it was participants who had higher impact beliefs and those who chose more often that engaging is the better action compared to not engaging in a particular behaviour, who were more supportive of *prioritising the environment*, more in favour of *structural level actors' responsibility* for reducing emissions (marginal in the *action impact* condition), in higher agreement with *individual responsibility* and had higher *political action intentions*.

In Study 2 there were no overall significant effects of the condition on the dependent variables. However, participants agreed significantly more with the manipulation statement indicating that individual behaviour change has a large impact than with the statement indicating that individual behaviour change has little impact. Those who viewed behaviour change to have a large impact also agreed more with the interconnection between environmental and social well-being, while those who agreed more that individual behaviour change has very little impact were (marginally) less supportive of prioritising the environment, and less supportive of structural and individual level actors' responsibility and showed lower *individual behaviour change intentions*. This suggests that those who viewed individual behaviour change as less

effective were less in favour of both structural and individual responsibility in reducing climate change.

In Study 3, participants in the *individual action* condition were significantly more supportive of prioritising the environment than were those in the *structural change* condition. It seems that an emphasis and higher agreement on the impact of individual action (Study 1) and receiving information on the importance of individual action compared to structural change (Study 3), significantly influenced participants' agreement that the environment should be prioritised. Also notable for Study 3 is that participants in both conditions (*individual action* and *structural change*) were significantly and marginally significantly (respectively) in higher agreement that individual citizens should do more to reduce climate change (*individual responsibility*), than participants in the *control* condition. The correlations showed that the more participants agreed that individual action is crucial to reduce climate change, the more they were supportive of prioritising the environment (marginally), structural and individual level actors' responsibility and the higher were their intentions to engage in political action and individual behaviour change. Further, the more participants agreed that structural change is crucial to reduce climate change, the higher they scored on all dependent variables. The only exceptions to this were the dependent variables which related to the individual level (i.e. participants had marginally higher individual behaviour change intentions, but there was no significant correlation with individual responsibility).

The results of these studies seem to suggest that participants viewed individual actions to be quite beneficial in reducing climate change, as in Study 2 participants agreed more that individual behaviour change has a large impact rather than very little impact. Past research from one survey showed that the more concerned respondents (of a nationally representative sample in the USA) believed that: "… if the actions they are personally taking were widely adopted throughout the modern industrialized world, it would significantly reduce global warming" (Maibach, Roser-Renouf & Leiserowitz, 2009, p. 13). Additionally, highlighting the value of individual behaviour change made participants more supportive of prioritising the environment than did highlighting the value of structural level change (Study 3). Further, participants' estimate of the impact of a particular action was noteworthy, as they viewed, for example, a person's increased recycling to have more impact than a person's reduction in taking flights (Study 1).

In the above studies there was little support for the prediction that focusing on the benefits of individual behaviour change would reduce support for structural level change, when compared to presenting individual behaviour change as ineffective or compared to the positive framing of structural level change. However, this could be due to the design of the studies, rather than a lack of the existence of such a pattern, since the manipulation might not have been successful in inducing a particular focus on one form of change over the other, or the dependent variables might not have been adequate for testing support for structural level change (as further discussed below).

It could be that the present findings were influenced by participants' general environmental values, whereby participants who were more concerned about climate change might simply have been more supportive of any kind of action (irrespective of the individual or structural level). Past research has found that anthropogenic climate change denial and scepticism tends to be higher in more right-wing compared to more left-wing leaning people (Dunlap & McCright, 2008; Klein, 2014; McCright & Dunlap, 2011a; McCright & Dunlap, 2011b). Therefore, those who are more pro-environmental may not only be more supportive of individual behaviour change (e.g., recycling more), but also more supportive of structural level changes (reforms in line with left-wing ideas). Thus, in the present research, it would have been beneficial to control for participants' prior environmental and political views.

A possible explanation for the findings that participants were overall favourable towards individual behaviour change and showed widespread agreement that it has a large impact, could be that it is due to participants' general exposure to positive messages in society about individual behaviour change. Alternatively, people may be motivated to retain a view of the effectiveness or impact of individual action in order to maintain a sense of 'agency' or 'power'. As Norgaard (2011) suggested, people do not only experience helplessness in regards to their own ability to reduce emissions, but also experience "a lack of confidence in the political system" (p. 191) to successfully reduce emissions. If people are sceptical about the ability and effectiveness of the political system, then it could be more reassuring to hold on to a belief in individual level impact.

Although these studies set out to examine the broader question of whether focusing on individual behaviour change may divert attention and support away from structural level change and government responsibility (Kent, 2009; Shove, 2010; Webb,

2012), it is questionable whether this can be achieved in one (or even several) studies. The expectation that one block of information may change people's views is questionable, especially given that the individualised approach is not just present in specific behaviour change campaigns, but constitutes a broader culture, long-term societal processes and continual exposure to certain messages (as discussed in the introduction), which is difficult to mimic or manipulate in a simple experimental study. Another limitation of all three studies is that one of the dependent variables juxtaposes the economy and the environment as two separate issues, with one needing to be prioritised over the other. This is a problematic framing which mirrors that of political public discourse where spending questions are commonly framed as 'either' / 'or' debates. This kind of presentation obscures the fact that environmental and economic decisions are entwined and that they can be addressed together, rather than requiring a choice of priority. For example, Klein (2014) has argued that restructuring the economic system and modes of production could occur in tandem with the reduction of greenhouse gases, whereby social and environmental well-being could be enhanced. Therefore, future studies would be advised to use dependent variables that do not pit the economy against the environment. Moreover, the dependent variables might not have successfully tapped into views on structural change or governmental action.

Kent (2009), Shove (2010) and Webb (2012) amongst others, have argued that individual behaviour change campaigns lay the responsibility for addressing climate change on the individual. Future research could investigate how the use of individualism in behaviour change campaigns influences attention towards government responsibility and support for structural level change. Future research could also investigate whether people who believe more strongly in the impact of individual behaviour change are supportive of certain types of structural change, as opposed to others. They may support governmental change which enables individual behaviour change: for example, by increasing the availability of recycling banks or public transport. Participants may not be thinking of structural level change in terms of taxes to corporations or even more fundamental changes to the economic system, such as moving away from a growth-based economy.

Future research could also try to unpack questions raised from the current findings, such as examining why certain behaviour changes are seen as more impactful. For example, are participants more likely to judge the behaviours they engage in

themselves to be more impactful than those behaviours they do not engage in? Under what circumstances do people become more supportive of structural level change and how does it relate to individual behaviour change? Is it, for example, the case that participants who hold stronger pro-environmental values are simply more supportive of both individual and structural change?

In conclusion, although these studies found little support for the notion that individual behaviour change framings distract attention from, or reduce support for, structural level change, this could be due to the design of the research. Questions still remain as to the kinds of discourse and policy agendas that an individual behaviour change approach reproduces. The emphasis here is not to propagate a continuation of high consuming or wasteful lifestyles in Western countries, but instead a reassessment of effective mitigation strategies. This will necessitate a critical look at the structural context.

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- Chapter 4 -

"It never rains in California": Understanding of drought as a natural and social phenomenon

Abstract

Since 2012 California has been experiencing an exceptionally severe drought resulting in a variety of social impacts. In response to suggestions that inaction on climate change is due to its temporal and spatial distance from 'the West', I examine how people in an industrialised country responded to the local expression of climate change in the case of the California drought. During ten weeks of fieldwork in late 2015 I conducted 77 interviews with people in urban and rural areas of the state. In this chapter the analysis focused on how people experienced the drought, in isolation of views on climate change. The first three themes that were discussed related to people's understanding of the drought as physical changes in 'nature', which varied depending on their conceptions of normality, on the location and on their emotional responses. Theme four examined how some people interpreted the drought as a social and political phenomenon (not as a purely physical one) for example in terms of water issues being related to financial motives. The fifth and final theme explored experiences of the drought that have been marginalised. Examining perceptions of drought (even if the focus is not on climate change narratives) can enhance our understanding of how people relate to changes in their environment and how this may influence views on climate change.

It never rains in California – there is even a song about it. Words to this effect were uttered by one Californian, indicating that lack of rain and drought conditions were not so unusual (as the song by Albert Hammond was taken to suggest), but others disagreed. In this chapter I examine how some people in California experienced the drought at the end of 2015.

Water is the essence of life. How do people, who have been living in a land built on dreams of individual liberty, abundance and pushing back limits, react when they are confronted with discussions indicating the threat of water scarcity? The case of California is especially noteworthy because of the cultural context in which the drought is occurring. The USA - and California in particular - has been constructed as a place where everything is possible, where there are few limits (natural or social). As Reisner (1986) examined in *Cadillac Desert*, several towns and cities in the south-western United States were built in deserts, in direct defiance of nature's hostility. Given this setting the drought in California presents a reminder of a lack of water in that region and of humans' dependence on their natural environment.

One reason sometimes given for inaction on climate change mitigation is the idea that the effects of climate change are (supposedly) distant in time and location (presumably from 'the West') and are therefore not tangible and immediate (Giddens, 2011; Swim et al., 2009[26]; Weber, 2006). This assumption has stimulated research into how people's beliefs about climate change are affected by personal experience of floods and droughts (e.g., Capstick et al., 2015; Leiserowitz, Maibach, Roser-Renouf & Hmielowski, 2012) and into their mitigation and adaptation behaviours (e.g., Blennow, Persson, Tomé & Hanewinkel, 2012; Whitmarsh, 2008).

Leiserowitz et al. (2012) found that 69% of a nationally representative sample in the United States (and 71% of those living in the western US) somewhat agreed or strongly agreed that global warming was affecting the weather in the United States. Further, Leiserowitz, Feinberg, Howe and Rosenthal (2013) showed that 55% of their Californian sample agreed that they had personally experienced the consequences of

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[26] The authors concretely stated: "The likelihood of seriously and noticeably adverse events as the result [sic] global warming is bound to be small for the foreseeable future for many regions of the world" (p. 22).

global warming and 19% said global warming would cause a great deal of harm to them personally.

However, a Gallup poll in the USA in 2010, showed that 67% of the sample, maintained that climate change would not seriously threaten them or their way of life in their lifetime (while 32% thought it would [Newport, 2010]). In light of this Ruddell, Harlan, Grossman-Clarke and Chowell (2012) proposed that:

> This sentiment may suggest that in a wealthy, industrialized, and urban society, most people who respond to telephone surveys are buffered from the immediate and severe effects of climate change by technological adaptations in the built environment (e.g., indoor heating and cooling systems, food storage capacity). (p. 583)

The authors examined whether urban residents in Phoenix showed sensitivity to climatic change and whether their experience-based knowledge overcame other factors, such as influences from social networks, institutions, ideology and campaigns, in informing their opinions of climate change. They found that different social demographic characteristics predicted perceptions, whereby women, minorities, politically liberal, older people and long-term residents were more likely to report that the temperature was getting a lot hotter over time in Phoenix. Further, temperature in a given neighbourhood showed a modest correlation with the mean neighbourhood perception of temperature change. Ruddell et al. (2012) concluded that participants were sensitive to temperature change and that experience-based knowledge closely matched scientific evidence of local temperatures. Most importantly, however, at the neighbourhood scale the strongest predictor of perceived relative temperature was the neighbourhood's temperature, while social demographic characteristics were not significant. This suggests that at a more local scale, factors such as ideology, gender or age are trumped by the personal experience of temperature change. Similarly, Evans et al. (2015) examined the relationship between the occurrence of drought and the public's views on water supply and climate change-related water issues in the southern United States. Survey responses were spatio-temporally matched to short and long-term drought events. The authors found that local conditions of drought significantly predicted participants' concern about water supply and climate change in relation to water. Specifically, long-term drought conditions influenced concern over current and future water supply as well as future drought likelihood, while short-term drought conditions predicted opinions about future drought likelihood and global warming related precipitation changes.

Similarly, Armah et al. (2015) found that coastal Tanzanian people's perception of temperature increase matched the scientific time series for the same period and the authors suggested that in the case of incomplete or absent meteorological records, local climatic change perceptions could be employed to supplement scientific evidence. Notably, the authors found differences in perceptions depending on demographic variables, such as age, location and education. For example, older people who lived in rural parts of Tanga were more likely to report temperature to be cooling rather than warming, compared to younger respondents living in urban parts of Dar es Salaam. Due to differences across locations Armah et al. (2015) recommended increasingly orienting climate policy locally. The authors concluded their findings by challenging the notion that climate change is not relevant to daily life:

> It is often suggested that achieving public engagement with climate change is difficult because it is not a matter that is relevant to people's daily lives or concerns. The results of this study challenge this assertion. During the past decade, climate change has become much more than an environmental issue. It is a global challenge whose repercussions are felt in all facets of our society. (p. 148)

In line with this suggestion, Capstick et al. (2015) found that after the Winter 2013/2014 floods in the UK, 26% of respondents (of a nationally representative sample living in flood affected areas) indicated that their level of concern over climate change had increased over the last 12 months. Sixty-nine percent of respondents reported their concern remained about the same and 4% said it had decreased. Amongst the most common reasons stated by those with increased concern were directly observable occurrences, such as reference to heavy rain and/or floods (26%), as well as changed weather patterns and extreme weather (25%).

Despite the increase in research on local climatic change perceptions, there has been less qualitative work, especially in affluent countries such as the USA. Affluent countries arguably have a larger responsibility to reduce emissions, given both their historical and current contributions to emissions and the unequal distribution of effects between more and less affluent countries (Klein, 2014; Norgaard, 2011). These circumstances are also acknowledged by the conferences of the parties' (COP) adoption of the principle of "common but differentiated responsibility" (Koch, 2011, p. 146). Therefore, studying US citizens' experience of climate change is particularly relevant given that (a) perceptions and experience have been argued to influence concern about

and action on climate change (Armah et al., 2015; Blennow et al., 2012; Swim et al., 2009) and (b) the USA, as one of the (historically and currently) highest per capita carbon emitters, also holds more responsibility to reduce emissions.

Qualitative research may extend insight into people's experience of local climatic change by focusing in-depth on individuals' perceptions and responses. Several qualitative studies of drought experience have been conducted in Australia (e.g., Alston, 2006; Anderson, 2009; Pearce, Willis, Wadham & Binks, 2010), while the present research was conducted in the US.

In this chapter I focus on Californians' understanding and experience of the drought. This approach is similar to the approach taken by Pearce et al. (2010) who studied people's perceptions, attitudes, emotions and related responses to drought in outback south Australia. In the next chapter I will look at how the experience of drought related to people's views on anthropogenic climate change.

The case of the Californian drought

Since 2012 California has been experiencing an exceptionally severe drought (Griffin & Anchukaitis, 2014). There are various definitions of drought depending on whether one's approach is for example hydrological, meteorological, agricultural or socioeconomic (Wilhite & Glantz, 1985). One definition drawn upon by Mann and Gleick (2015) which took into account that societal factors interact with physical factors suggested that:

> In the most general sense, drought originates from a deficiency of precipitation over an extended period of time--usually a season or more--resulting in a water shortage for some activity, group, or environmental sector. Its impacts result from the interplay between the natural event (less precipitation than expected) and the demand people place on water supply, and human activities can exacerbate the impacts of drought. Because drought cannot be viewed solely as a physical phenomenon, it is usually defined both conceptually and operationally. (National Drought Mitigation Center, n.d.)

Although the supply of water is contingent on social, political and economic decisions about its use and distribution, there are nonetheless noteworthy physical changes in California, as detailed below.

This drought is driven by simultaneous low precipitation and extreme[27] high temperatures (AghaKouchak, Cheng, Mazdiyasni & Farahmand, 2014) and is unprecedented in at least the past 1200 years (Griffin & Anchukaitis, 2014). In particular, 2014 and 2015 were the warmest years on record in California (NOAA, n.d.). Unique circumstances in the modern history of California resulted from the combination of increased demand and diminished surface water availability due to reduced snowpack, streamflows and reservoir levels (Griffin & Anchukaitis, 2014). Further, the observed drying (Damberg & AghaKouchak, 2014) was predicted to continue with drier and warmer climate trends in the future (Cayan et al., 2010). Cook, Ault and Smerdon (2015) also suggested that risk of extreme drought, influenced mainly by heightened temperatures, was increasing in the western United States, irrespective of precipitation trends.

It is important to note that California is a characteristically dry state and that droughts are: "… a fundamental feature of the climate of western North America" (Griffin & Anchukaitis, 2014, p. 9017). Over the 20th century parts of the western United States witnessed extended dry episodes, yet the 2012 – 2014 period surpassed the previous droughts in the mid-1970s and late-1980s (Griffin & Anchukaitis, 2014).

There is evidence that the present drought is linked to anthropogenic climate change (Cook et al., 2015; Diffenbaugh, Swain & Touma, 2015; Mann & Gleick, 2015) and California's Governor Brown has publicly acknowledged this evidence (Knowles & Durisin, 2015). As a consequence of news coverage, for some members of the public there will be an awareness of a link between drought and climate change, or if they remain sceptical, at least the presence of a debate. Further, the drought has had significant impacts, as noted in the Governor's executive order:

> … the severe drought conditions continue to present urgent challenges including: drinking water shortages in communities across the state, diminished water for agricultural production, degraded habitat for many fish and wildlife species, increased wildfire risk, and the threat of saltwater contamination to

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[27] Extreme weather events and extreme climate events (for ease referred to jointly as climate extremes) have been defined as: "The occurrence of a value of a weather or climate variable above (or below) a threshold value near the upper (or lower) ends of the range of observed values of the variable." (SREX, cited in Leonard et al., 2014, p.116).

fresh water supplies in the Sacramento-San Joaquin Bay Delta … (Executive order B-29-15, Brown, 2015, p. 1)

On 1st April 2015 Governor Brown issued an executive order enforcing state-wide mandatory reductions in urban potable water use by 25% (State Water Resources Control Board [SWRCB], n.d.). The timeframe for reductions was originally set from June 2015 through February 2016 relative to the water used in the same months in 2013. Since California continued to experience severe drought in January 2016 the emergency regulations were extended through October 2016 (SWRCB, 2016). Each water district had autonomy over how to achieve this cut and districts' reduction rates were adapted according to the existing residential per capita usage. Thereby, districts with lower usage had to reduce their consumption less and districts with higher usage had to reduce it more (with cuts ranging between 8-36%). The mandate prohibited, for example, the application of potable water to driveways and sidewalks, to outdoor landscapes if it caused runoff or within 48 hours of rainfall, to clean vehicles (unless using a shut-off device) and restaurants could only serve water upon customer request (SWRCB, n.d.). Regarding residential indoor usage, the state's "Save Our Water" campaign provided various reduction recommendations such as shorter showers, using washing machines only for a full load and recycling dishwater for use on houseplants (Save Our Water, n.d.). Even if these changes do not sound significant, they pose a relatively contrasting relationship with water than that of the more common abundance and wastefulness in Western societies.

Why drought narratives matter

Nisbet (2009) highlighted the importance of the framing of climate change and making it relevant to people's existing worldviews for it to result in public engagement. Abbott and Wilson (2015) suggested that an understanding of societal reactions to the notion and reality of climate change was necessary and would be enabled by the examination of lived experience. Further, they argued that people's communication about their experience (for example in an interview) was not just a process of reflection, but that the articulation of experiences was part of the meaning making process and became part of the experience itself: "We are the product of the stories we tell about ourselves and how these may or may not be modified through communication and engagement with others" (p. 5). Thus the representation of drought, how people

conceptualise, talk and feel about it is important in order to understand how people are experiencing and producing the meaning of extreme climate events.

Abbott and Wilson (2015) also highlighted the variety of experiences between rich and poor people and between affluent and less affluent countries in relation to extreme weather events. Taking the example of hurricane Katrina they illustrated the extent to which the context of economic, social and cultural factors influenced people's experience. They pointed towards the intersection between social and environmental vulnerability, so that: "… even if you live in the richest country on the planet, insecure livelihoods, weak education and poor housing combine to make greater the negative impacts of extreme weather events" (p. 7). Historical and current power imbalances evidenced in a variety of social injustices form the societal structure in which people face anthropogenic climate change. This points towards the importance of examining predominant narratives and the factors that influence and mediate people's understanding and experience of extreme weather events.

Drawing on three case studies Alston (2006) highlighted women farm-workers' experiences of drought in Australia in 2003 and drew attention to the way in which they were particularly affected by drought and by the government's lack of financial support. The author criticised the prevailing presentation of drought being focused on the impact it had on the landscape and the decrease in agricultural production, while failing to acknowledge - and therefore intervene in - the hardships faced by farm-working families and especially women. Further, Alston (2006) noted that women farm-workers took on responsibility and feelings of guilt for the lack of well-being in the family. Thus, the research highlighted the role that dominant narratives and presentations of drought played in shaping understanding and responsibility, as well as individual and political responses to drought. The author drew on Foucault's work (1980, cited in Alston, 2006) to argue that "discourses help construct reality and hence shape relations of power" (p. 157).

Apart from the differences in who is affected, there is a question relating to the extent to which the drought is perceived as normal (because of previous droughts) or whether, due to its extremity and imposition of mandatory water cuts, it is perceived as disruptive. Given that in affluent countries people (at least of the middle and upper classes) are more used to discourses of abundance and growth than to discourses of scarcity, there is arguably the potential for a disruption of everyday life. Habermas

(1984, cited in Abbott & Wilson, 2015) in discussing the question of what makes us human, pointed towards the importance of our ability to both labour, reflect on and (most importantly) challenge and shape society. The ability to labour referred to the manipulation of the material conditions under which we live, such as "our ability to transform our physical environment or 'nature' for productive use" (p. 181). The second point of challenging and shaping society, is particularly relevant in the face of climate change. To what extent may physical disruptions and discussions about the drought facilitate a communicative rationality that can lead to challenging the social and economic system?

Beck's (1992) theory on risk society may be helpful in understanding how risk is perceived and mediated by science. Beck (1992) defined risks as usually invisible radioactivity, toxins or pollutants that often induce irreversible harm on plants, animals and people. Risks are established through causal interpretations and are therefore open to interpretation:

> They can thus be changed, magnified, dramatized or minimized within knowledge, and to that extent they are particularly *open to social definition and construction*. Hence the mass media and the scientific and legal professions in charge of defining risks become key social and political positions. (p. 23)

It is only through science that many people know about anthropogenic climate change. With the exception of numerous indigenous communities, lots of people do not rely on knowledge of their local environment in order to survive, which can increase reliance on Western science to perceive and learn about long-term shifts in climate. This gap between direct experience and scientific evidence creates the room for social and political contestation. Although the drought is more perceptible to direct experience (than for example sea level rise) it is still mediated by other factors such as understanding of science and presentation in the media. Within this gap a variety of understandings and explanations for the drought can emerge and are worth examining.

In this chapter I therefore scrutinise how people understood, interpreted and experienced the drought. I investigate what kind of changes people noticed and what their experiences of those changes were. The key research questions were: What does drought mean to people living in California? What are some of the factors that influence their experience?

Method

From 25th September to 8th December 2015 I conducted fieldwork on the drought in California. For reasons of anonymity I will not mention the names of smaller places and have changed people's names. I visited a range of places from large coastal cities to smaller towns in the north, south and east of California, as well as in the Central Valley. In total I interviewed 77 people (using a voice recorder) who I had contacted either by e-mail or approached on the street, in cafés, on the bus, in the library or other public spaces. Thus, the sample consisted of people to whom I had easy access. I asked people if they had time to talk about the drought and most of them were happy and willing to do so[28]. I used a semi-structured interview plan which I followed loosely from memory and adapted spontaneously according to the direction of the conversation. To begin, people were usually asked whether they thought there actually was a drought or not, and if so, whether it was affecting them. I tended to ask people what they thought was causing the drought, or whether it was related to climate change towards the end of the interview. The interviews lasted from anywhere between five minutes to one hour. Apart from the voice recorded interviews I had many off-the-record conversations about drought and other topics that offered a glimpse into the daily lives of people living in California. Additionally, I kept a field diary to record observations and followed news coverage of the drought in the period of my visit. By e-mail I contacted people who worked in water-related jobs, such as water utilities or fire fighters. Overall I spoke to people of many different professions, including teachers, street cleaners and gardeners. I did not ask participants to report demographic information (such as age or race) because this would have seemed intrusive in the informal and conversational setting of the interviews. Occasionally participants made reference to such demographic information, for example mentioning their occupation, in which case I took note of it.

By conducting my research in another country to my own (the USA rather than England or Germany) I had the benefits of being an 'outsider', allowing me to observe

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[28] I acknowledge that this method of data collection was enabled by my appearance (that of being a white woman) which meant that people were largely open to engaging with me when I approached them in public spaces.

different cultural practices, taking fewer customs for granted and being able to ask 'naive' questions.

Analytic approach

All interviews were transcribed (by myself and three assistants) including false sentence starts, repetitions and most fillers like 'um', 'err', and 'you know', most of which were however removed from quotes reported in this chapter. The coding and data analysis were flexible and informed by, but not exclusive to, thematic analysis (Braun & Clarke, 2006). Employing a broadly contextualist method, I examined how individuals make sense of their experiences, while taking into account how these meanings and experiences relate to the larger social context (Braun & Clarke, 2006).

I coded the transcripts in NVivo to help me organize the data. Using an inductive approach, I was primarily driven by the data, rather than a pre-existing coding frame or theoretical preconceptions. Nonetheless my analysis will invariably have been influenced by my previous reading: "Categorising is … an interactive process in which priority is given to the data, but understanding is inevitably facilitated by previous understanding" (Elliott & Timulak, 2005, p. 154).

Reading and rereading the transcripts, I coded them into meaning units, which: "… are usually parts of the data that even if standing out of the context, would communicate sufficient information to provide a piece of meaning to the reader" (Elliott & Timulak, 2005, p. 153). The meaning units could range in length from a sentence to a paragraph. They were organised into themes and subthemes. Some text passages were double coded into various themes. I selected and combined themes that related to and complemented each other into separate chapters, although not all themes were incorporated. I acknowledge the active role I took as a researcher, in which I identified themes, selected which were of interest and presented them to the reader, i.e. themes did not passively 'emerge' (Braun & Clarke, 2006). Although I organised meaning units into themes, I did not discard quotes that were dissimilar to others. Distinctiveness was also important in guiding my analysis, in line with Elliott and Timulak's (2005) stance that:

> … no data should be left out in this step, because idiosyncratic aspects of the phenomenon can inform the study in interesting ways. After all, qualitative research is interested in the different aspects of the examined phenomenon;

therefore, it should not discard some of them just because they are infrequent. (p. 155)

To improve the validity of my results I triangulated, i.e. double checked and compared my findings across different sources and methods, such as media coverage, interviews and observations. In the following analysis the extracts I provide are illustrative examples. My description and interpretation of them is also informed by what other people said and by what I observed. However, it is up to each reader to decide whether my interpretation is convincing or not.

Results

It is important to note that the analysis presented in this chapter is primarily in relation to people's perception of drought, irrespective of views on climate change. The aim is to provide an insight into how people understood local changes, while in the next chapter I examine how people related local changes to climate change.

Themes are marked in bold and subthemes are indented. The use of three dots indicates that a passage from the interview has been removed and words in brackets explain what the participant meant.

Ideas of normality

One theme related to people's ideas of what is 'normal', concerning for example rain patterns, snowfall, lake and river levels. These ideas involved certain conceptions of nature, which often had to do with nature as non-human, i.e. as separate from humans. Nature was conceptualised as weather, the landscape such as lakes, trees and mountains, and contrasted to the human-built environment, such as cities. The idea of what constituted normality also had a temporal aspect, since people needed a comparison with what was 'normal' in the past, for example: "The mountains were barren and normally it should have been just packed and white" (Anna). Notions of time were also involved in claims about droughts as being natural and cyclical (recurring over time) and therefore 'normal'.

When I spoke to Jake who originally came from the East Coast, he noted that people in Los Angeles (LA) were used to not having water, that water had always been brought into the city from somewhere else and that therefore nothing had really changed with the drought.

> Jake: It's weird, when you talk to people that have lived here all their lives, they're kinda like, "yeah, whatever".
>
> Sarah: They're not bothered?
>
> Jake: Well, "we've never had water", so like, I guess they're kinda used to it … it just it never rains here, and they're used to that and they get their water from somewhere else and always have … if you look around there's nothing different, I mean, it's all watered plants down here so.

Establishing an idea of what is normal is necessary as a baseline comparison for noticing and outlining change both in terms of landscape and access to water. In the two examples above, Anna's comment presents her idea that previously and normally the mountains should have been covered in snow at that time of year. She noticed a change in landscape which she classified as unusual. In contrast Jake's response demonstrates that because Los Angeles "never had water" (i.e. it is brought in) the relative absence of the city's own water had become normal. Therefore the drought did not necessarily present a different state of affairs or cause for concern. People 'knowing' that the region was dry and their being used to it meant that the drought condition did not pose an 'abnormal' comparison.

Location: Inside versus outside of the city

As touched on above, location influenced the level of exposure to changes in weather and the landscape that people experienced, which in turn influenced feelings of the drought being 'real' or 'abstract'. People in cities sometimes noticed changes in weather, but overall people in rural areas tended to be more immediately surrounded by, and aware of, both changes in weather and landscape. Direct experience and the media served as sources of information on the drought.

The role of weather in cities. In the Bay Area some people commented on the weather being warmer, on changes in the timing of seasons, like the summer starting earlier and lasting longer and above all, they noted the absence of fog in San Francisco, which was described as feeling mysterious and being characteristic of the city. This illustrates how one of the ways city dwellers experienced 'nature' or 'the outdoors' was through weather. It suggested that the weather defined a place and how people related to it – giving the place a certain feeling and creating a 'place identity'. Further, weather and climate patterns are important to place identity because they influence what people can do, such as recreational activities. Agriculture is also weather dependent and plays a

big role in California. Anna described the noticeable changes in warmer weather, but suspected that people in her city did not feel the effects as much as people in other places.

> Sarah: So do you think people within San Francisco feel affected by the drought or not really?
>
> Anna: I mean, I feel like in a way yes, because the weather is so much nicer, I mean this kind of warmth that you've experienced day after day, after day, after day, is really unusual so, but, I don't know if people think it's the drought or if it's climate change, or if they just are like "well", they don't, they're just, they don't care. But I don't feel that we have this, like we have to (tighten) our belts as much as like southern California or maybe other places.

Observing changes in landscape. Other experiences of the drought related to observed changes in landscape. People who lived in rural areas or towns tended to describe changes in their immediate surroundings. One town in the north of California lay in a region that has historically had abundant water, as it was surrounded by mountains and lay at the source of springs and a river. People in this region had a close tie to water and mention of the pristine water source tended to come with a sense of pride and appreciation. The extract below illustrates an idea of what was normal in that area in the past.

> Rod: I mean here in this town, I don't know if you know the water system, but it comes out of the springs on the mountain and it never sees the light of day until the water comes out of the tap and there is no filtration and there is no chlorination and it is spring fed. I don't know if you've tasted it, but it's really good water, so we've had a really good deal here for a long, long time.

However, here too water was running low and people talked about the local springs running dry:

> Rod: So, for instance, we have the springs on the mountain, but then because there has been a drought the last four years, in the previous three years we have two wells and they had to turn the wells on, and last year the wells weren't, between the wells and the springs it barely kept up with demand.
>
> Thomas: We definitely see some of the springs that have shallow aquifers, they're starting to dry up seasonally. (One) spring which is just up here in the mountain, it's in a campground situation, it hasn't flowed for like the last two years. There's other ones, you know, which we could point out.

Since that particular town relied on some of these springs for its water supply, people living there were able to closely follow water running low. This was different from places like LA, where water is shipped in from further away and people were less

closely in touch with their water source. However, in that town in northern California people also still had water coming out of their taps, so although they knew of direct changes in their surrounding landscape, they were not experiencing water shortage themselves.

Drought as abstract: In the city people do not feel affected. People felt affected by the drought on differing levels depending on location. For example, in larger cities people were more likely to know about the drought from the media rather than from direct experience. Larissa in San Francisco said she only knew about the drought from the news and that she did not personally feel affected. She believed the news although she had no direct experience of the drought.

> Sarah: Do you think that there is a drought happening?
>
> Larissa: Umm, yes I do. But I only know that because, I read it in the paper and see it on the news.
>
> Sarah: Right. So it's not like you personally feel anything different?
>
> Larissa: I don't personally feel anything different. I mean, I believe it, you know, but like I said, it doesn't really, it hasn't really affected me so much.

A similar point was made by Geoffrey in the same city:

> Geoffrey: I'm thinking most people in the cities are only aware of it (drought) from the media, but they haven't faced any true dilemma … I think anyone whose livelihood depends on water, is gonna be more affected. Here, we've been asked to please stop using water.

Although people had been asked to reduce their water usage, it is noteworthy that some people in the city did not experience this mandate as a way in which the drought affected them. In the same city, Layla also stated that despite the water reduction measures, she sometimes forgot about the drought and that in the city people were "isolated" and did not understand the "seriousness".

> Layla: You know those measures are happening but I just feel like, even personally for me, like sometimes I forget there is a drought, and then there's a little bit of rain and I'm like "oh we need more" and then, I don't know, I think we are pretty isolated from like people who are actually experiencing drought, like people who really don't have water coming out of their tap … just places that really aren't the city. But yeah, I know that there are places that actually felt that, like, struggle and I feel like we are not a group of people who have actually really like experienced it, so we are not really understanding the seriousness of it at all.

Similarly, Deborah in LA described that there was an intellectual but not a practical awareness of the drought, and she suggested that one reason for this was because everyday life was still continuing as 'normal'. So not only were ideas of what constituted normal weather patterns or landscapes important, but ideas of normal daily life also shaped people's experience of the drought, pointing towards the influence of social cues on people's response. Because everyone else was continuing as usual, little disruption was experienced. Deborah outlined her perception of a disconnect from nature and the 'reality' of drought which was being reported.

> Deborah: We have been quite aware through the media of the drought issue, we don't feel any, we haven't seen any difference in terms of every day of our lives and so it's just an intellectual awareness but it's not a practical awareness. That's how it feels, that we're just hearing about it, they're scaring us about it but we are not, you know, it's not affecting like our everyday life. Which can be disconcerting because you kind of go on with your life like everything is normal and you know, at what point will we feel the impact, you know, that's the question.

Related to Deborah's question about when people would feel the impact, Arthur thought that it had to get to the point where water was not coming out of the taps anymore.

> Arthur: If you go outside the city … you can see it's just burnt up, everything is so brown and dry and hot and so you kinda see it when you leave the city … San Francisco people I think are aware and conscious and they, a little bit, try to do stuff to cut down on water but, I don't think people are making that big of a deal of it … because we turn on our taps, we get water (laughs) so you know, people don't want to change their behaviour I don't think, people don't want to, you know, deal with reality, you know that we have a very populated world and, overpopulated you could say, nobody ever thinks or talks about that, you know so, if things are inconvenient a lot of times, I think as Americans we just kinda turn a blind eye and do whatever we want and don't worry about the consequences to others so much maybe.

Arthur suggested that in San Francisco the drought is not 'a big deal', but that people do try and reduce their water use a little. People are not yet being inconvenienced so he argued they did not want to deal with 'reality', indicating that people held drought at a distance. He also implied that overpopulation was part of the problem, but that inconvenient topics were collectively ignored. Later, Arthur also commented that "people need to feel it before they react", indicating that the situation was not yet bad enough to cause more of a reaction.

Several of the above extracts highlight that some people said they did not feel affected by the drought because they still had water coming from their taps. This

suggests that they equated drought with water shortage. Since they did not experience direct water shortage, they took it to mean that they were not affected by the drought. However, the institutional definitions of drought (mentioned in the introduction and by Chleo who worked for a water utility company [discussed later]) do not suggest that residents will necessarily experience running out of water.

Because of the way water infrastructure is organised, Tom argued that people have water until it runs out completely. The implication is that people do not feel impacted because they do not experience a gradual decline in water availability.

> Sarah: Do you feel like the drought has personally affected you?
>
> Tom: No, it's living in a city … (the water is) all piped down here, so we have been living, the city has been living unnaturally since the beginning so, as long as there is enough water in the reservoir, and the reservoir is low, but you know the way the system is set up is that you either have water or you don't, it's not really a question of degree.

In the following interview with Kyle, who ran a hostel in a recreation area in eastern California, he mentioned that the drought in general had affected tourism because of the lack of snow throughout the years.

> Kyle: Everything tourist related, restaurants, accommodation, rentals, tour guiding … really everybody, and everybody knows somebody who works in that business, so if it didn't affect them directly, it's also, in turn, I don't have, well, hypothetically, I don't have as much money, because I'm not making money here, so I can't spend it on other things in town. So it affects the entire economy.

Yet, even in this area, Kyle later stated that people (including himself) weren't being directly affected. I had asked him whether people talked about the drought.

> Kyle: It's talked about a lot, but it's also ignored a lot. It's the sort of thing that, it doesn't always interest people that much, because it doesn't affect them directly, so it'll be put, just like you know all other dilemmas in the world, on Facebook and things like that, and in the paper and in the media, but really when it comes to like, I have never had a conversation with someone this lengthy at the hostel and thousands of people come here every year. So I mean, it's not something that is affecting me so directly that it needs to be discussed all the time, yet, if you listen to people who are really talking about it and discussing the facts, it is pretty dire, in a lot of situations, certain counties, certain cities, and if it persists the way it is, it'll be, you know, it'll affect lots of people drastically … But, I don't know, for the time being people just kind of see what happens, just kind of wait it out, I guess.

Kyle's comments might at first seem slightly contradictory, but they indicate that the drought is strangely present as well as ignored (people talked about it a lot and also ignored it; people were and were not affected). People posted about the drought on Facebook, but did not talk about it in lengthy conversations. In other interviews as well, there was sometimes the sense that the drought was affecting other places (Kyle said "certain counties, certain cities") or at least, that it was worse elsewhere and might get worse in the future. So, although people knew about drought to an extent, and even if their local area was being affected, some people still seemed to experience drought at a distance.

Tom commented that climate change and drought is "too big an issue to connect with", implying that drought remains intangible even when people are surrounded by it.

> Tom: Climate change is so huge … it's too big an issue to connect with, even drought, you know, I mean drought I guess you could say "oh I can have shorter showers" and everything, and in that way you can connect with it, but beyond that.

One person also mentioned the role of science as a mediator of people's interaction with the world and as contributing to people not feeling so affected.

> Lennard: We feel like we are untouchable, totally, "it won't affect us" … and the reason we've been able to feel that way is 'cos of science, and now when science tells us we have to change people want to, you know, not do it.

There was a sense that people in cities only noticed the drought when they left the city, e.g., through seeing changes in landscape. This suggests that people did not view the urban environment as natural, almost as though being in a city cut them off from 'reality'.

Emotional responses

Seeing the changes in the natural environment evoked different emotional responses, especially fear. Changes in 'normal' landscape and weather patterns were widely perceived as scary. However, there were also attempts to remain optimistic and hopeful by seeing positive sides to the drought.

Fear. Several people responded emotionally to the drought, describing the changes they were seeing for example as being "scary". Anna discussed a visit to her friend in a mountainous region in eastern California.

> Anna: A couple of years ago I went to see my friend in the east of California, and I think it was the first winter that it was really warm and not much snow and we were, we did something and I just looked at the mountains, we couldn't go skiing because it wasn't enough, and we just like went for a walk or something, and I just was like "wow this is really scary" because the mountains were barren and normally it should have been just packed and white and, so yeah it's, it makes me scared at least for this area of California.

The absence of snow felt "scary" to Anna, suggesting that when she saw the changes in landscape there was not just an intellectual understanding of the drought. Anna went on to describe a more recent experience of the same area.

> Anna: When I went up to see her, you know a week ago, it had rained, you know that all day Saturday and then the next day we went for a walk and she was like "Oh wow" we walked by the river and she was like "Oh the river's actually kind of flowing again" which she was happy about, she was like "Oh", 'cos I guess it hadn't really been flowing, so … and I was like "wow, that's kind of crazy".

In this instance going for a walk was one way in which Anna described noticing the drought through interacting with and experiencing her surroundings. Realising that the river had stopped flowing seemed "crazy" to her, language which again suggested that it was something out of the ordinary. Seeing the river flow again was a surprise and source of happiness for her friend (a sort of nostalgic happiness, which compared the current state of the river to past states of the river).

Willow described the drying of a lake which she noticed on a car journey from San Francisco up through northern California.

> Willow: So there is most definitely a drought happening. Today on the drive up I passed Lake Shasta, Lake Shasta is not a lake anymore. We have seen a decrease over the last couple of years, but this is, it basically looked like a dried up meadow with a tiny, tiny stream coming to it. There is barely any water there at all, there is most, most definitely a drought. Rain is such a rare occurrence, I think it's only really happened a few times since I've lived here, like a bit of drizzle sure, but like actual rain, rain doesn't, doesn't really happen very often. And it feels very miserable and scary actually, yeah.

Willow also expressed her emotional responses, stating that the lack of rain felt "miserable and scary", comparable to words used by Anna. This extract illustrates how people use their direct personal experience of seeing, for example, a dry lake bed or the lack of rain, to inform and confirm their understanding of the occurrence of a drought (the certainty of which appears to be reinforced by Willow's emotional reaction). This points towards the difference between cognitive and emotional forms of knowledge.

Concern was also raised specifically in relation to the future. For example, Lennard in the Bay Area mentioned his concern over future water issues.

> Lennard: It kind of scares me, that's like the future, like water's going to be a real big deal out here.

Tom (also in the Bay Area) described that there was a widespread sense of foreboding, indicating that fear and worry were common rather than isolated experiences. In response to my question whether people were feeling impinged in their freedom in relation to the mandated water reductions Tom answered:

> I haven't heard that, I mean I think people generally, there's a sense of foreboding around here, like this isn't right, and this is a real concern, and things could get worse and we are all very worried about it.

Optimism[29]**.** While several people referred to the changes as "scary", Thomas, who worked for the Forest Service (so was a government employee) in a northern Californian town, weighed up the pros and cons of the drought.

> Thomas: On the positive side, there's more recreational opportunities in terms of camping, hiking, that sort of thing. On the downside, skiing has really suffered … (One ski resort) had a very limited season this last year, they only opened for I think like two or three weeks and that is a big wintertime economic boom to the community … it has a domino effect where they're not making money, their employees are not making money, all the little businesses in town like especially the restaurants, not so much the grocery stores, but the restaurants, they're not making money, we've actually seen a few that have closed up, which is unfortunate. So there is an economic effect from the drought … But, on the positive side, the town didn't have to spend any money on snow removal (laughing). And nobody here had to shovel snow for the first time in a long time, which is back breaking intensive work when you're trying to shovel out your driveways and stuff … So there's positives and negatives, is what I would say.

One question is to what extent his weighing up of the pros and cons is an attempt at being balanced and neutral in his views on the drought - a kind of scientific approach often appealed to in Western democratic values. Thomas' cost-benefit analysis and level

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[29] Optimism is not necessarily classed as an emotion here, but it is a contrasting reaction to the otherwise unpleasant emotional responses such as fear. Optimism could be argued to be an emotion management strategy in order not to experience an unpleasant emotion. Norgaard (2011) examined optimism as an attempt to manage information and uncertainty: "… I described how too much information evoked community members' feelings of uncertainty, and so the information was carefully managed. The strategy of controlling one's exposure to information reflected the emotion norm of optimism. Educators and activists themselves had to be careful not to become overwhelmed in order to continue their work" (p. 127).

of optimism is striking, given that he described the local economy as being seriously affected, as well as previously mentioning nearby springs running seasonally dry. Despite these effects he is still able to be fairly nonchalant about the drought and to see positive sides to it. He did not remark on any unpleasant emotions, which may be partly due to the perceived benefits he outlined.

Understanding the drought as a social and political phenomenon

Despite the majority of people stating that they believed there was a drought, there were some people who thought there was more to the drought than just a lack of water due to physical changes in nature. Their contestation varied from the argument that there was no drought at all, to milder versions suggesting that there was also a political side to the drought. This highlighted that people did not understand the drought purely in terms of natural and physical changes, but also pointed to a social component, concerning the demand and distribution of water. This understanding of drought is in line with the definition mentioned in the introduction (which acknowledged social factors).

As discussed above, in some cases the notion that there was still water and that life continued as 'normal' meant that people only had an "intellectual awareness" of the drought. However, in other cases the absence of a direct water shortage led people to conclude that there was actually no drought. A woman who worked for a water utility company in eastern California voiced her frustration at people not believing in the drought because they confused water shortage with drought.

> Chleo: Because one of my biggest frustrations this summer up here is, there has been people in this community who have said multiple times throughout the summer that we are not in a drought … and I just want to scream because you don't know what the definition of drought is then (laughs) because … one of the things I'll tell you is that we are not in a situation of a water shortage. We have a very stable water supply, and ah, so that a lot of people up here they know that … and they confuse water shortage with drought. It's like, well, they are often related but they are not the same ... But if the drought continues then we probably will be looking at a water shortage.

One person in LA argued that there was no drought because LA was being supplied by the Colorado River which he said was not about to run out and that California had always been dry. He suggested that there were political motives for creating the, in his opinion, fictive drought in order to make money (as water would become more valuable).

Several other people suggested that the drought was exaggerated and used by politicians for ulterior motives and that "it's being exploited" (Rod), although they did not argue that the drought was being 'made up'.

A similar line of argument has been followed for climate change more generally, suggesting that it is used to further certain political agendas. Specifically, it has been argued that climate change is a left-wing attempt to increase government intervention and regulation of corporations and individual freedom (Klein, 2014). One Republican Party member made this point very explicitly.

> Martin: For the advocates of extreme response to global warming the grabbing of a drought to further their, I'll call it political agenda is contrary to science … people will try to draw that connection (between drought and climate change) … but it's for a, what I'll call political purpose to get to cause action on the part of people. It's not because of a rational, you know, intellectually constructed logic (laughing) … there is an undercurrent of ideological political thought that would like more governmental control … over people … it's the government using this CO_2 emissions thing to determine where people are gonna live and how they're gonna drive and what kinda house they're gonna live in … So, it's an intrusion of the government into personal liberty.

Another example of people contesting the political nature of the drought was highlighted by signs along the roads in the Central Valley (the agricultural centre of California). The highways were lined with signs that were critical of Governor Brown's approach to the drought. They were visible to anyone who drove through California and their presence was common knowledge. Rose referred to the signs as implying that the water crisis was being created by the government (although she personally did not agree with this interpretation).

> Rose: I'm trying to remember exactly what the signs say, but they imply that politicians have created the water crisis and that we need to get them to stop it. And there are signs that, quite a few of them up and down the freeway, right, because that's where there's a lot of agriculture, right by the freeway, and there will just be these signs posted "government caused water crisis" you know, "stop", you know, "water equals jobs", all through, so somebody is putting up those signs, more than one person.

This contention around the drought and water distribution may well be more extreme in the agricultural epicentre because of the larger amounts of water required for agriculture and because of possible differences between some Republican farmers and the Democratic governor.

However, the political handling of water allocation was also criticised from a more left-wing perspective by Rod who worked for a water related non-profit organisation.

> Rod: Consumptive water rights claims are five times more than the available water supply in a normal water year … what that means is that California is in a perpetual drought, regardless of how much it rains, there is always a claim for more water than exists, so if we build more dams and reservoirs they are going to be empty in the fourth year of drought, just like all the other reservoirs, because the claims are so great, and so until California does an accounting of how much water is actually available and who is entitled to it, there is always going to be a demand for more water than exists and we are always going to be living beyond our means.

Rod in particular had a lot of knowledge about water issues, due to his work, and was very critical of the State government's handling of water, including a specific measure the state was funding. When I asked him why that was happening he replied:

> Rod: Because of money, because politicians are owned by the big corporations, for instance, there's a big, very wealthy people, Stewart and Lynda Resnick, they live in Beverly Hills, they are billionaires, you've heard of POM International? … the Resnick's have the largest citrus and pistachio farms in the state … Californians in the cities were told to cut their water consumption on average of 25% because of the drought, (but) the state is allowing people like the Resnick's and others to continue to plant permanent crops like almonds in areas with poisoned ground, over-drafted groundwater, where the ground is actually sinking because they are pumping so much water … and there's no constraints, they've put no controls on, or no prohibition in … And again it's a classic example of the corporations and the wealthy people buying the politicians and the common person does not have the resources to the politicians or the courts to change this. It's a very, very corrupt system and it's very discouraging.

Although Rod's knowledge is very particular, this extract illustrates the awareness that some Californians had of large scale water use and the state's involvement with 'big' agriculture. Some people in cities were also sceptical of the political handling of the drought. Felicia (Bay Area) told me that her water prices had increased and wondered what the actual figures of water availability were at the reservoir that supplied her area, since it was one of the largest.

> Felicia: We have the largest water supply … I think there's some political … agendas involved, yes, I do. I used to believe, oh yes, we're in a major drought, but I think that it's more than that … I do, now, what are my bases for that? I mean, my water rates have increased 30% … my question is, I never see the numbers that are being used at (the water reservoir). We have the largest water source right here … so I am wary of the political sense of what is happening.

Others thought it was implausible that the drought was literally being created by politicians or corporations, but agreed that they might use the situation for profit.

> Betty: It's not raining, we know it isn't. It isn't a scam from the government that it's not raining … I don't think corporations are that smart. I think, if the rain stops they're like "ok, maybe we can raise rates". They're sort of, they're the jackal of what's happening outside, but they're not the cause of it.

How the drought is understood is important because narratives and interpretations influence people's view on the appropriate response. One example of this is how different water interests were sometimes constructed as opposite and mutually exclusive. For example, there was the pitting of environmentalists (and 'the fish') against the interests of farmers and the interests of cities. In response to the question of what he thought should be done to better prepare for droughts in the future, Martin proposed increasing storage capacity, but said that this would conflict with environmentalists.

> Martin: And that (increasing storage) runs into the environmentalists who really want to restore pristine valleys and not be as concerned about people … We've got this inherent conflict between agriculture and the cities and the environment, whether you help the fish … and let the rivers run free in order to help the fish, or whether you hold them back and help the people and of what you hold back, how much goes to the cities and how much goes to the farmers, so it's really that three-fold argument.

Martin's assumption was that there is not enough water for everyone (water scarcity) and therefore he saw an 'inherent conflict' in water distribution. He was in favour of prioritising farmers and cities and increased storage, which would damage the free flow of rivers and thereby fish. The different understandings of the natural and social aspects of the drought had consequences because they led to different proposals for solutions, ranging from increased storage, e.g., dams, across desalination and restructuring of water allocation, to reducing the influx of people, i.e. immigration. These contrasting claims concerning the cause of, and solutions to the drought highlighted the political nature of what is sometimes framed and understood as a merely physical phenomenon.

Finally, another example of contestation of the handling of the drought related to the individualised approach of water conservation. Willow suggested that individuals were being targeted as the culprits for bad water practices when she thought that fracking and 'big' agriculture made the real difference (as also mentioned above by Rod). This point illustrated that even if people did not see the drought as created by

politicians, there was sometimes an awareness of the individualisation of water conservation (similar to the individualised approach to climate change mitigation discussed in previous chapters).

> Willow: When you drive around highways in California it's really common to see signs saying like "we're in a drought - conserve water", you know "turn that tap off when you brush your teeth" really basic kind of suggestions which imply that individual people are the main cause for bad water practices, for unsustainable water practices is another way of saying it, and so, this kind of information is promoting the idea that all you have to do is change your habits and daily life and then we won't be in this problem, which completely disregards the fact that farmers, and agriculture, are the biggest industry that is utilising most of the water in California, and then things like fracking, you know, there's so many big industrial causes, I think would need to change. People are very much being targeted to kind of imply that that's the root cause and that they have kind of autonomy over that, which is just such an illusion.

Marginalised experiences of the drought

There were effects and experiences of the drought which were not commonly acknowledged or mentioned. There were some people who were being affected more severely, but with whom I had little contact and whose predicament seemed to receive little attention. For example, there were low-income, mostly Latino/a, farm-working communities in the Central Valley who had actually run out of water. This raised questions over sources of information, such as news coverage of water-related issues in California. Two women working for a water utility company in a coastal city mentioned the water problems in the Central Valley, which existed prior to, but were exacerbated by the drought. Lucy pointed towards the land and water usage in agriculture, thereby highlighting that lack of water was not purely due to physical fluctuations in nature, but depended on social practices.

> Lucy: In the Central Valley people don't have access to safe drinking water … their groundwater is contaminated … people have to drink bottled water. They don't have the luxury of going to their tap to drink … California, one of the most developed economies of the world … people don't have access to safe drinking water … it goes back to how water has been used, land uses.

Further, one of the springs that was going dry seasonally (mentioned by Thomas) is a sacred site for one of the Native American tribes (personal communication, Norgaard, 2016). Another example in the way in which Native Americans were impacted by the drought was the decline in salmon populations due to low water levels and water management practices by the state. One person mentioned this aspect.

> Rod: On the Trinity and Klamath rivers we have Indian tribes over there that have rights to catch half of the fish, so if those fish go extinct, you're talking a cultural change to those tribes.

Longstanding rituals and daily practices are not buffered or mediated by taps (i.e. town and city infrastructure) but this aspect was rarely mentioned by participants. Factors such as location, infrastructure, social status and sources of information influenced how people were affected by and understood the drought.

Discussion

In this chapter I have examined people's understanding of environmental change. The recent drought in California was used as an example of how people experienced and interpreted local expressions of anthropogenic climate change. People understood the drought in California both as a physical change in nature (e.g., less rain) as well as related to the social and political organisation of water. An idea of normality was important to understand change: people compared the drought to what they regarded as normal weather, water and landscape conditions. While people in cities were able to perceive a change in weather, they were more removed from changes in landscape. Furthermore, because the drought was less visible and there was still water coming out of the taps, people in larger cities tended to describe that they had an intellectual, but not a practical awareness of the drought. There were also some emotional responses to the changes: fear, for example. In addition, various people were suspicious regarding the political handling of the drought, showing how the drought was socially contested. Finally, there were certain narratives and impacts of the drought which were not widely mentioned or reported, such as the exacerbation of water availability in the Central Valley for farm-working communities and the effects on Native people's livelihood.

Ideas of normality

Ideas of normality and perceptions of time are especially relevant since the time scales on which long-term changes in climate take place may be outside of the timespan perceivable to many humans. The passage of time can influence people's interpretation of what is normal, such as older people having experienced previous droughts and therefore potentially being less inclined to see those droughts as unusual (see chapter 5). In relation to perceptions of time Norgaard (2011) noted that:

> Although there are many reasons why thinking about the consequences of climate change is not part of daily life in Bygdaby [code name for a town in Norway] one of them is clearly the disjuncture between the sense of time necessary to observe climate change or make its consequences seem 'real'. Although this experience of the world appears and feels 'natural' or 'inevitable', perceptions of time are in fact socially produced. (p. 114)

For example, she mentioned environmentalists' critique of Western societies' short-term thinking as partially responsible for long-term environmental risks, such as in the case of nuclear waste. She contrasted this with the Iroquois Nations' reputation for basing decisions on how they would impact people seven generations down the line.

Perceptions of normality and change depended on location. On the one hand some people described changes in landscape compared with what it was like 'normally', indicating that people perceived a shift in their surroundings, in which drought constituted the 'not normal'. On the other hand, some had been socialized into knowing that (especially the south of) California was dry and that there was little water, i.e. normalising the absence of water. Consequently, there was a narrative in certain places, such as LA, that made the absence of water seem normal. The idea of normality had already been constructed to adapt to dry conditions in California. At the same time and contrary to the narrative of California as dry, people experienced water coming out of their taps and sometimes saw green, watered landscapes. Thus, it could be argued that the way cities are built renders the lack of water and dryness invisible. This is in line with Ruddell et al.'s (2012) suggestion (quoted in the introduction) that some people are buffered from the direct impacts of climate change through the built environment. The combination of city infrastructure and narratives that rendered California's dryness to be normal, seem to result in a situation where people can continue to have and see water without feeling threatened by a discourse of lack of water.

In relation to Habermas' (1984, cited in Abbott & Wilson, 2015) theory of communicative rationality it would appear that drought and related social impacts are sufficiently buffered and normalized in particular parts of the state, to circumvent a significant disruption of everyday life or challenges to the social system. Despite the state-wide reduction in urban potable water use by 23.9% compared to 2013 levels (Kostyrko, 2016) this research indicated that several Californians did not register a severe interruption in daily life.

Location and perceived distance of drought

In some areas of California people observed changes in their immediate environment, for example in weather patterns and the landscape. Almost everyone agreed that in the last few years there had been noticeable changes, which ranged from the loss of 'luxury' recreational activities (such as skiing), to the loss of water sources (springs and wells running dry). These findings are in line with research showing that people in various parts of the world, including the USA, were sensitive to changes in their environment, such as in temperature (Armah et al., 2015; Evans et al., 2015; Ruddell et al., 2012). Several previous studies have also noted the importance of location in influencing perceptions of drought and other local environmental changes (Armah et al., 2015; Pearce et al., 2010; Pearce et al., 2012).

Consistent with Armah et al. (2015), the present findings challenge the suggestion that inaction on climate change is due to its distance in time and location[30]. Climate change is not inherently far off or distant (in time and space) but perceptions of distance are socially created (Gamson, 1992; Zerubavel, 1997, cited in Norgaard, 2011). For example, one participant noted that people did not want to deal with reality, because they did not want to change their behaviour and thus turned a blind eye. This is in line with suggestions by Norgaard (2011) and Zerubavel (2006) that collective silence and ignoring occur on the societal, not just individual level. Norgaard (2011) suggested that this was an active process: "… holding information at a distance is actually an active strategy for people as they negotiate their relationship with climate change" (p. 121).

Even the more local, i.e. 'close' example of drought was not consistently perceived as close, relevant and real because these perceptions were mediated by other factors. Several aspects were mentioned as to why some people only experienced the drought intellectually and did not feel affected (such as cities' water infrastructure). These findings stand in contrast to suggestions by Evans et al. (2015) that:

> It is, for example, logical that those respondents who live in areas with lower levels of annual precipitation would tend to express greater worries about water supply, as the water supply in drier regions tends to be more complicated, expensive, and insecure than in areas with plentiful rainfall. (p. 203)

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[30] For example, Weber and Stern (2011) stated: "The main causes of climate change (greenhouse gases) are invisible, its impacts are geographically and temporally distant for most Americans, and, as discussed below, its signals are hard to detect (Moser, 2009; National Research Council, 2009)" (p. 317). Although there is likely some validity to this argument, it is important to also acknowledge the social production of distance, concern and threat.

Despite surrounding dryness, people in LA, for example, still had access to water and did not report being more concerned about the drought than did people elsewhere. Accordingly, precipitation and temperature changes do not appear to be linearly related to concern about drought or access to water, but are mediated for example by infrastructure and ideas of 'the normal'. Norgaard (2006) found that although people in a town in Norway were aware of global warming and were experiencing changes in climate: "… global warming was an abstract concept that was not integrated into everyday life" (p. 373).

Perceptions of risk

Apart from some Californians noticing changes in their immediate environment and linking them to climate change (see chapter 5) there are also examples of individuals and societies acting despite there being a distance to a perceived risk, both in the case of climate change (Isenhour, 2013), distant wars or future health concerns. This means it is crucial to examine the social production of distance and of what constitutes a risk in society (Beck, 1992; Zerubavel, 2006), a prime example being the attention given to terrorism. 'Distance' does not seem to define level of threat, *per se*, and does not necessarily define action or inaction. It is socially influenced perceptions of risk which render a potentially distant or not distant phenomenon into a concern. This relates to Beck's (1992) theory on risk society, as there is a high reliance on science as mediator of phenomena, such as climate change. This creates a disconnection between claims made as a result of scientific discovery and direct experience, which for example often cannot establish causality (Beck, 1992). This gap in turn leaves room for social and political interpretation of a phenomenon, such as defining the level of risk. The social contestation of drought and climate change is one such example.

Emotions

Experiential learning is associated with holistic, affective responses that are quick, intuitive and automatic (Slovic, Finucane, Peters & MacGregor, 2004). Abstract and technical information such as statistical accounts, in contrast, involve more cognitive effort and are less compelling (Epstein, 2008). More recently the role of emotions has gained attention in research on climate change communication and risk perception, affirming that emotions are important for practical and moral decision making (Roeser, 2012).

In line with previous research on emotional reactions to environmental change, some participants described emotional responses to the drought (Ford, 2016; Norgaard, 2006, 2011; Pearce et al., 2010; Petrasek MacDonald, Harper, Cunsolo Willox, Edge & Rigolet Inuit Community Government, 2013). For example, there was some indication that people reacted emotionally to the visual experience of a changing landscape, which served as confirmation of what they already 'knew' about the drought from the news.

Norgaard's (2011) work in Norway showed that there were a variety of emotion management strategies that people used to regulate and control unpleasant emotions towards climate change while failing to produce serious action. Maintaining optimism while facing local snow depletion, seasonally dry springs and negative effects on the local economy, may be an example of such emotion management strategies.

While some climate change messaging has used fear as a way of trying to move people towards engagement, O'Neill and Nicholson-Cole (2009) found that although fearful representations of climate change may attract attention, they are ineffective in generating motivation for action. Instead the authors suggested that imagery which is not threatening and that relates to people's daily emotions and preoccupations is a more engaging strategy. However, people cannot be protected from an unpleasant emotional response when they personally notice changes in their natural environment. The question remains whether fear is similarly ineffective in spawning engagement when it occurs in this real world setting, or whether it may after all become a motivator for action.

Sources of information

Several people mentioned knowing about the drought through media coverage, highlighting that people not only relied on their direct experience, but also on media to gain understanding of the drought. Gamson (1992) examined the influence of experiential knowledge (e.g., personal experiences and those of close others), popular wisdom (e.g., shared knowledge in a particular subculture) and media discourse, on people's constructions of proximity and meaning of an issue. In some cases all three factors were present to influence Californians' perceptions of drought. Gamson (1992) described that whether or not an issue touches people's daily lives is not an intrinsic property of the issue, but depends on the meaning the issue has for people. He argued that personal relevance of an issue varied with the context. People living in a city who

neither personally saw the changes in landscape, nor felt personally affected, described feeling "isolated" from the drought. Hearing about it on the news did not necessarily suffice to make it 'real' or 'close'. This illustrates how if only one of Gamson's (1992) factors applied it was not enough to make a given phenomenon feel close or real, although people still reported believing it on an intellectual level.

Social construction of scarcity and environmental issues

Some people defined the drought in part as a political and social phenomenon, rather than a purely environmental one. This relates to Selby and Hoffmann's (2014) critique of the dominant presentation of water 'scarcity' as arising out of either overpopulation or as a result of economic goods being inherently scarce. Although the authors were not discussing the case of California, some of their points were consistent with topics raised by several Californians. Some Californians did suggest water scarcity was linked to an increasing population. But others questioned how scarce water in California really was, and how water was being used and distributed (as opposed to assuming that water was inherently scarce).

In line with some people's suspicions about how the drought might be exploited by politicians for their own political aims, Lubell (2014) stated: "… perhaps the most interesting aspect of drought politics is how it stimulates political and policy change … And California politicians have a tradition of using drought as a political tool for pushing favored policies" (para. 9). The findings regarding the social contestation of water management and some Californians' awareness about the influence of political decisions on water availability, is in line with the notion that water management is inherently political (Mollinga, 2008). Discourses of natural scarcity may be one way of depoliticizing and naturalizing a conflict, rather than looking at its social and political origins (such as power relations which influence access to resources and distribution). As some participants suggested, there are social and political practices, including water storage, allocation and usage (e.g., agriculture) which affect water availability.

The way in which drought was framed was important because it influenced how it was responded to, publicly and politically. Gamson (1992) noted the impact of omissions on the framing of an issue: "Systematic omissions make certain ways of framing issues extremely unlikely" (p. 6). For example, not many people (only those who worked with water-related or environmental organisations) seemed to know about,

or mention, low-income farm-working communities' water problems or the effects of water practices on Native communities. This is particularly relevant in line with Zerubavel's (2006) work examining collective silence and omissions, since attention influences perceptions of relevance and response.

Limitations

One limitation of this research is that I did not interview any Native American communities and only a few people in the Central Valley. However, I did not make this a central aspect of my research. The focus was not on the impact of the drought, but rather at how people with relatively more resources and power responded to it and how it would affect their views on climate change. Another limitation is that because of the way I divided up my chapters (which draw on the same fieldwork), I separated the understanding of drought (chapter 4) from the analysis of its relationship to views on climate change (chapter 5). This decision may have created a deceptive representation of a lack of talk about climate change in the present chapter. It should therefore be noted that in the interviews climate change was also discussed and these findings are presented in relation to drought in the following chapter.

Future research

Future research could investigate how certain communities are being affected by drought more so than others, because of how the drought interacts with social inequalities and what consequences this has for political action. Additionally, it could be worth investigating how perceptions of drought influence people's water usage. There are questions relating to how information and knowledge that come from news and scientists, supplement people's lived realities and behaviour. Future research could also examine the relationship between gender and emotional responses to extreme climatic events. Some emerging research indicates that risk perceptions, including climate risk, are gendered, such that women generally are slightly more concerned about climate change than are men (Brody, Zahran, Vedlitz & Grover, 2008; McCright, 2010). Norgaard (2006) also noted that although emotion management strategies seemed to be employed across the community, she found these techniques more commonly used by educators, men and public figures.

I have presented here some of the ways in which some people in California made sense of the environmental change occurring around them in the form of the recent drought. The drought was understood both as physical changes in nature and as related to the social and political organisation of water. Further, it was evident that certain narratives and impacts were less known, such as those concerning Native people and low-income Latino/a communities. Location and media coverage influenced how people interpreted the drought and those different interpretations had consequences in terms of the solutions that were proposed and supported.

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- Chapter 5 -

No drought about it? The influence of personal experience on views of climate change

Abstract

The research reported here examined how people (n = 77) living in California experienced the drought in late 2015 and to what extent they thought it was linked to climate change. Interviews were conducted in different parts of California, including large northern and southern coastal cities as well as rural areas. The reasoning common to people who believed that there was a link between the drought and climate change ranged from relating it, for example, to an increase in temperatures, to reduced rainfall or to science. In contrast, people who did not believe that there was a link between the drought and climate change tended to draw on past droughts and cyclical climate patterns as well as invoking science. Participants did not say that the drought brought about a change of mind about climate change; rather it seemed that people either already did or did not believe in climate change and accommodated the drought into their existing worldviews. Future research could examine how perceptions of drought and climate change relate to adaptation and mitigation approaches.

Both lay and academic explanations for inaction on climate change[31] have raised the notion that its consequences are distant in time and space. It is argued that the causes and impacts of climate change are intangible and lack immediacy and therefore fail to stimulate understanding, concern and action (for further discussion see e.g., Giddens, 2011; Moser, 2010; Weber & Stern, 2011). While this explanation may be partially helpful in understanding public and political inaction on climate change, there are some shortcomings to this way of thinking: other crucial factors also need to be taken into account. Firstly, both poorer and richer countries in many parts of the world are already being affected by the consequences of climate change (IPCC, 2012, 2014). However, it is important to acknowledge that people will be affected to different degrees by, and have different levels of defense against, the effects of climate change and extreme weather events due to socio-economic factors. As the IPCC (2012) pointed out: "Individuals and communities are differentially exposed and vulnerable based on inequalities expressed through levels of wealth and education, disability, and health status, as well as gender, age, class, and other social and cultural characteristics" (p. 7). Secondly, perceptions of distance to climate change are socially created (Norgaard, 2006, 2011). Thirdly, beliefs about and action on climate change are highly politicized (Klein, 2014; McCright & Dunlap, 2011a, 2011b).

Anthropogenic climate change and extreme climate events

Ungar (2000) outlined the cultural production of scientific understanding, concern and response to different topics, such as comparing the ozone hole to climate change. The author argued that the ozone hole presented more of a "hot crisis" (providing an immediate and concrete sense of risk, p. 298) than does climate change, partly due to the future long-term effects of climate change. However, this raises the question of why extreme weather events that occur now, do not engender a similar hot crisis situation. Ungar (2000) proposed that one reason for this was that a global average increase of a few degrees can appear insignificant compared to the fluctuations in temperature people experience on a daily basis: "Climate change is a risk 'buried' in

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[31] "Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems" (IPCC, 2014, p. 2).

familiar natural processes such as temperature change and weather fluctuations" (Whitmarsh, 2008, p. 4).

Another debate relates to the difficulty of attributing single extreme climate events (such as floods, hurricanes, heatwaves or droughts) to anthropogenic climate change: "Attribution of single extreme events to anthropogenic climate change is challenging" (IPCC, 2012, p. 9). The caution that many scientists have shown in linking the two has been supported by sparse reporting in the media (Ungar, 2000) and may contribute to public uncertainty about the link between extreme weather events and climate change.

Two studies found that 97% of scientists in the field agreed that anthropogenic factors were increasing average global temperatures and were changing the climate (Anderegg, Prall, Harold & Schneider, 2010; Cook et al., 2016). Other studies have suggested there has been an increase in concurrent extremes in climate and that the combination and interaction of climate variables have produced extreme impacts (Hao, AghaKouchak & Phillips, 2013; Leonard et al., 2014). There is also evidence that global warming and the related rise in extreme temperatures has considerably increased the probability of extreme events such as heatwaves and droughts (AghaKouchak, Cheng, Mazdiyasni & Farahmand, 2014). The IPCC (2012) reported that: "There is evidence that some extremes have changed as a result of anthropogenic influences, including increases in atmospheric concentrations of greenhouse gases" (p. 9). Thus, human activity (mostly in the global North) has changed the climate to such an extent that extreme climate events are more likely.

Anthropogenic climate change and the case of the California drought

The subsequent question is whether or not the California drought in particular can be linked to anthropogenic climate change. While contentions have been raised over a link between the recent California drought and long-term warming trends (Funk, Hoell & Stone, 2014; Wang & Schubert, 2014) these studies focused on the incoming flow of water, such as precipitation. Patterns of precipitation are anomalously low, but not unprecedented in the past seven hundred years and still within 1.5 standard deviations of the mean (Griffin & Anchukaitis, 2014). However, other research has indicated that there *is* a link between an anthropogenic influence on the climate and the recent drought in California. The latter research pointed towards the importance of the co-occurrence

of higher temperatures (changing the outgoing flow of water via evaporation and transpiration) and low precipitation (Diffenbaugh, Swain & Touma, 2015; Mann & Gleick, 2015). Further, with projections for significantly drier conditions in the future, these trends are expected to continue and increase drought severity in coming decades (Cook, Ault & Smerdon, 2015). Griffin and Anchukaitis (2014) also concluded that: "Future severe droughts are expected to be in part driven by anthropogenic influences and temperatures outside the range of the last millennium" (p. 9022).

Impacts of the drought in California

Low river levels are endangering salmon migration to the point that the California Fish and Wildlife Service is transporting young salmon to the ocean in the hope of re-establishing future reproduction (Barkham, 2014). Salmon, such as the Chinook salmon, is listed as threatened and in danger of extinction (California Department of Fish and Wildlife, n.d.). The decline in salmon population impacts especially Native American people, such as the Karuk tribe, whose subsistence, culture and religion depends on salmon and is already being harmed as a result of capitalist production and related degradation of the natural environment (Hormel & Norgaard, 2009).

The pumping of groundwater, increased owing to the drought, has caused the subsidence of the ground in the San Joaquin Valley (a more arid southern part of the agricultural Central Valley) amounting to almost 2 inches (5 centimetres) per month in some areas (Farr, Jones & Liu, 2015; NASA, 2015). Subsidence in turn puts infrastructure at risk, because it can damage pipelines, bridges, and drainage and may also adversely affect the replenishment of groundwater aquifers as the soil is being compacted. Although a groundwater management bill was signed by Governor Brown in autumn 2014 (Siders, 2014), the deadline for establishing the rules to track and regulate groundwater in California is not until 2020 in most places (Kasler, Sabalow & Reese, 2015).

Drought is contributing to the struggle for clean water in the Central Valley, where polluted and dry wells especially affect low-income Latino/Latina farm-working communities (Belk, 2016; see also Community Water Center, n.d.). The impact of the 2015 drought on the agricultural sector was estimated at a total of 21,000 job losses and $2.7 billion of economic impact (Howitt, MacEwan, Medellín-Azuara, Lund & Sumner,

2015). On 1st April 2015 Governor Brown introduced state-wide restrictions of 25% on urban potable water use, relative to the usage in the same months in 2013 (State Water Resources Control Board [SWRCB], n.d., 2016). Although these are only some of the impacts of the drought, they represent reasons people could be concerned about the drought and potentially therefore about climate change.

Experiences of extreme weather events and views on climate change

Drought is only one of the possible hazards that climate change poses. Thinking in terms of solely one impact could lead to an underestimation of the total risk of climate change: "Unlike a heat wave or a hurricane, climate change is not a single hazard" (Weber & Stern, 2011, p. 317). However, it is still worthwhile making the link between extreme weather events and climate change, since the experience of the former may increase concern and action on the latter, as the research reviewed below suggests.

Some environmental issues manifested at the local level have been found to influence beliefs and actions regarding climate change to varying degrees. For example, Whitmarsh's (2008) work in the UK showed that people who experienced flooding differed only slightly from people who had not experienced flooding in their knowledge of and reaction to climate change. In contrast, people who claimed their health had been impacted by air pollution (compared to those who did not) were more likely to perceive climate change as a risk and this was related to believing that human activity influenced climate change as well as to taking: "… action specifically out of concern for climate change" (p. 369). The author suggested that: "Evidently flood victims view climate change and flooding as largely separate issues" (p. 368). She explained these findings in terms of people's perceived efficacy to act, because communities could reduce flood risk through local flood management, but: "… personal action to mitigate climate change could not produce any such tangible, local gain" (p. 368). However, Spence, Poortinga, Butler and Pidgeon (2011) found that participants who reported experience of flooding showed greater concern over climate change, as well as expressing a greater willingness to reduce energy consumption in order to mitigate climate change.

In another study Brody, Zahran, Vedlitz and Grover (2008) suggested that physical vulnerability differently affected perceptions of climate change in the USA. Specifically, they found that, on the one hand, living closer to the coastline and in relatively low elevation (thus being more susceptible to sea level rise) was significantly

correlated with higher climate change risk perception. On the other hand, temperature trends and exposure to natural hazards did not significantly correlate with climate change risk perception (except for fatalities associated with natural hazards). In contrast, Ruddell, Harlan, Grossman-Clarke and Chowell (2012) found that during an extreme heat period, metropolitan area residents in Phoenix, Arizona, were sensitive to changes in temperature. Concretely, they demonstrated that on the neighbourhood scale, people's perception of temperature significantly correlated with temperature simulations for that area. In line with these findings, Armah et al. (2015) showed that a large percentage of respondents in coastal areas of Tanzania perceived an increase in temperatures which matched the time series for the same period. The authors suggested that personal experience of climate change might shift public views on the subject and assist adaptation efforts and at the same time increase individual engagement in mitigation and policy support.

Importantly, climate change perceptions and actions have not only been found to be related to personal experience of local changes, but also to the experience of the impacts of policies. Niles, Lubell and Haden (2013) showed that farmers were more likely to believe in climate change if they had positive experiences of previous environmental policies (assessed through a farmer's view on four past policies, concerning pesticide use reporting, rice straw burning, a water quality conditional waiver program and stationary diesel emissions). Furthermore, the experience of these policies was more significant in predicting climate change belief than personal experience of climate change impacts (based on a farmers' perception of change in local water availability over the course of their career).

It would appear that experiencing drought does not consistently heighten concern over climate change. For example, Pearce, Willis, Wadham and Binks (2010) interviewed people in outback south Australia to examine their responses to drought, with the result that the authors identified the acceptance of drought as one key theme. They found that for pastoralists, some of whom had experienced previous droughts, there were mixed responses in relation to climate change: "For some, the drought was a sign of the cycle of weather patterns and very little to do with climate change, for others climate change was a clear and present risk" (p. 365). But according to Anderson (2008), periods of drought can pose a crucial spur for reflection and change in beliefs. The author examined the experience of drought and climate change in Australia (in the

Mallee), 2004 – 2007, and noted: "… significant moments of reflection and self-reflexivity, marked in public discourse by a pronounced shift in beliefs on drought and climate change" (p. 68). Evans et al. (2015) proposed that events such as drought presented an opportunity for public outreach to be successful in swaying opinions and behaviour.

Beliefs about climate change

One recent study in the US reported that 63% of its sample thought global warming was occurring, whereas 18% thought it was not. Thirty-two percent indicated that if global warming were happening, it was mostly down to natural changes, while 52% attributed it predominantly to human causes (Leiserowitz, Maibach, Roser-Renouf, Feinberg & Rosenthal, 2015). In contrast, another study reported that in California 79% of the sample believed global warming was occurring (11% did not). Further, 58% attributed global warming mostly to human causes, while 23% thought it was mainly due to natural changes. Importantly, 55% of the sample stated that they had personally experienced the impacts of global warming. Of those who did believe global warming was occurring, 84% indicated that it was at least moderately exacerbating heatwaves and 77% thought it had at least moderately influenced droughts (Leiserowitz, Feinberg, Howe & Rosenthal, 2013).

It is crucial to allow for both natural and social science studies to understand the implications of climate change. Alves (2014) suggested that it was: "… not possible to understand CC [climate change] without identifying the relationships that are established between nature, society and its culture" (para. 2). Social factors are crucial because climate change affects human communities and also because human actions caused climate change and shape the response to it (Alves, 2014).

The present study

Information is often shared through conversation (Ungar, 2000), and interviews - even if directed by certain questions - are likely to somewhat reflect the existing narratives about drought and climate change. In this study I draw on the case of the California drought in 2015 and examine people's experiences thereof in relation to their views on climate change. The context of these views is that countries in the West have been amongst the highest contributors to per capita carbon emissions (see e.g., Clark,

2011; Goldenberg, 2014; Kanemoto, Moran, Lenzen & Geschke, 2014). Divergences in climate change responsibility and vulnerability are related to historical relations, whereby Western countries built their wealth on colonialism and capitalist production based on the exploitation of 'resources' and labour (Clark & York, 2005; Klein, 2014; Merchant, 2005; Norgaard, 2011, Parks & Roberts, 2006; Stoddart, Tindall & Greenfield, 2012): "European capitalism expanded through the establishment of colonies in the Western and Southern Hemispheres that supplied both the natural resources and cheap labor that extracted them from the earth" (Merchant, 2005, p. 32). Further, as Stoddart et al. (2012) stated: "While the wealthier nations of the global North bear the greatest historical responsibility for contributing to the problem, many of the poorest countries of the global South will likely be the most vulnerable to flooding, drought, food shortages, and other environmental risks" (p. 43).

Past research on the experience of climate change in industrialised countries has relied mostly on quantitative surveys and few qualitative studies have been conducted in the USA. Using interview data I examined the following research questions: What effects is the experience of drought having on people living in California in terms of their beliefs about climate change? How do people experience drought and what makes them think that it is linked to climate change or not? To what extent do people think that the drought has or has not changed their views on climate change?

Method

Two and a half months of fieldwork were conducted in California (25th September – 8th December 2015). A variety of regions were visited such as Los Angeles (LA) and the Bay Area, as well as smaller cities and towns in northern, eastern and central parts of the state. For anonymity, people's names were changed and place names were mainly reported for larger cities. In total 77 interviews were voice recorded using a Dictaphone. Many other conversations were conducted off-the-record and I also followed news coverage of the drought, both of which were recorded in my field notes and influenced my analysis. Participants were primarily approached in public spaces, such as parks, cafés, buses and the streets. Some people who worked in water-related jobs, such as for water utility companies or fire fighters, were contacted by e-mail. This resulted in a sample of people from different professions, ranging from teachers, street cleaners and health professionals to radio presenters. A semi-structured interview plan

was followed from memory and adapted according to the direction of the conversation. I opened the conversation by saying I was interested in people's experiences and views of the drought. Towards the end I closed the conversation by asking about people's views on possible causes of the drought and about climate change (if it had not been discussed already). Interviews ranged between 5 - 60 minutes in length. Participants were not asked for their age, race, and country of origin, gender or occupation (unless they mentioned it of their own accord in which case I noted it), because it would have been intrusive in the informal setting and flow of the conversation. The sample was largely limited to people to whom I easily had access in public spaces. Not being a US national myself had several advantages, since I had more of an outsider's perspective, was able to ask 'naïve' questions and take fewer social practices for granted.

Interview Analysis

Interviews were transcribed by myself and three assistants. Repetitions, hesitations, 'ums' and 'errs', were included, but removed from the quotes reported in the final write-up. Thematic analysis (Braun & Clarke, 2006) methods were used to guide the coding and data analysis. The analysis was predominantly data-driven, following an inductive approach and thus not guided by an existing theory or coding structure, although some interpretations will have resulted from my previous readings on a topic. A contextualist method was used, to acknowledge: "… the ways individuals make meaning of their experience, and, in turn, the ways the broader social context impinges on those meanings …" (Braun & Clark, 2006, p. 9). Following an iterative process, transcripts were read and reread. The transcripts were broken down into smaller meaning units, i.e. passages which make sense by themselves (Elliott & Timulak, 2005). Topics which were repeatedly mentioned, or which were of particular interest to the research questions, informed the labelling of themes. Eventually all transcripts were coded into themes and subthemes using NVivo. Themes that were related were organised together. Differences and idiosyncrasies were also noted (Elliott & Timulak, 2005), since I was interested in the diverse experiences and views of drought. The analysis examined how themes related to each other, as well as to the bigger picture of how and why a certain discourse may be operating in society. My role as researcher was active, as themes did not emerge from the data, but were selected and interpreted by me (Braun & Clarke, 2006). Triangulation was ensured by comparing responses across people from different backgrounds, as well as with news reports and my observations of

daily life. The extracts provided in the results are illustrative examples and the interpretation was guided by the other responses and by my observations.

Results

In this section I discuss four themes pertaining to perceptions of the drought in California in relation to views on climate change.

Linking the drought to climate change

To begin I examine some of the responses from people who thought that there was a possible link between the drought and climate change. Most people who referred to climate change or global warming seemed to be making reference to anthropogenic climate change. The caution people took in linking drought and climate change was notable, even when they agreed that humans have had some impact on the climate. One man in a northern mountainous region of California was cautious in his response to link the drought to climate change, but listed some of the changes he had noted and deduced that "it's hard to imagine it's not" linked.

> Sarah: Do you think it is linked to climate change, like the drought getting worse?
>
> Rod: Oh yeah, well clearly the warmer weather has resulted in a significantly reduced snowpack. The snowpack in the mountains of California is our number one reservoir of water, last year the snowpack in the Sierra Nevada was 5% of the historic average … so yeah, we might get more rain, but if we don't get the snowpack, it's definitely going to affect California and it does appear that climate change may already be having an effect, you know, some people say it is, some say it isn't … it's hard to imagine it's not with the poor snow we've had the last few years here.
>
> Sarah: And you think that's more natural changes in terms of climate change, or also human induced?
>
> Rod: I think it's human induced.

A woman in the Bay Area similarly suspected that global warming had contributed to warmer temperatures and a lack of rain, although she was also careful and moderated her response with the word "probably" when asked what she thought was causing the drought.

> Betty: Probably global warming.
>
> Sarah: Yeah?

Betty: Probably. Well, we've always been in the desert, California's always very, been, tricky, but, global warming doesn't help. So. And the fact that we haven't had rain, it's something probably manmade (coughs) excuse me. Because we've never seen temperatures this high this late in the year … Well, I think it's pretty easy.

Larissa in San Francisco promptly responded that climate change was causing the drought.

Larissa: Climate change.

Sarah: Climate change?

Larissa: I mean, obviously, weather is going to be different from year to year, but I do believe that climate change is definitely behind the pervasive worsening of weather over time, that we've been experiencing.

Sarah: Do you think that climate change is caused by humans?

Larissa: I don't know that it's caused by humans, I do know, I mean I do think that it's exacerbated, that the rate at which we're losing you know, atmospheric cover and all of that, is definitely caused by humans.

Larissa was initially hesitant to use the notion of cause when talking about the role of humans in climate change, but conceded that humans had 'exacerbated' changes in climate, thereby implying a causal role of some sort. In another case, a young male in LA did not mention climate change of his own accord. At first he explained that "there's never been water" and referred to the artificiality of the city. However, when directly asked about climate change he was quick to affirm and also saw a potential link to humans.

Sarah: Yeah, and what do you think is causing the drought then, what do you think, how come it's gotten a bit worse?

Kristian: Because there's never been water here in the first place.

Sarah: Right, so it's just kind of gradually getting worse?

Kristian: Well if you create an artificial, I guess biosphere, there are certain conditions that need to be kept for that biosphere to perform ideally, right?

Sarah: Yeah, so do you think it's linked to climate change, or?

Kristian: Everything is linked to climate change, I mean we are in a bubble, if you fart in the bubble, you know, someone's gonna smell it. Right? (Both laughing). Like, realistically, that's a terrible way to put it, but like.

Sarah: So like man-made, human-caused emissions?

Kristian: Yeah, there's definitely some of that. It's gotten way, way, way warmer in recent years than it has always been.

The above people mentioned the warmer temperatures and reduction in rainfall they had noticed. One woman in particular, in a north-eastern mountainous area of California, first referred to past droughts, but concluded that more so than the drought, it was warmer temperatures that, for her, were evidence of climate change.

> Chleo: I mean, I'll tell you, I'm not a scientist, do I think that the drought is linked to climate change? Absolutely. I think that, also though, that California has historically had long periods of droughts if you go back even thousands of years, I mean we've had mega droughts that have lasted over a thousand years. But I don't think, to me, I don't feel that you can deny the fact that climate change is affecting California, or this area, because one of the things, you know, more so than the drought, one of the things that I've noticed, that I think is a direct link to climate change, is the increase in the temperatures in the Basin. So, we're experiencing warmer temperatures that, like this summer is pretty darn warm (laughs).

Note how Chleo moderated her answer by pointing out at the beginning that she is not a scientist, a theme which is discussed in more detail below.

In the Bay Area, Marie, suggested that Californians, who read the newspaper, might be more conscious of anthropogenic climate change because politicians were talking about it. The media was highlighted as a medium through which people learned about climate change. Further, the notion that Californians were more aware of climate change than were inhabitants of other states, was also discussed by other participants. Beyond feeling affected by the drought, Marie drew on the fact that California was a coastal state and that people might be more concerned about climate change because of sea level rise. Notably, Marie in contrast to some of the more cautious participants, was very certain about climate change, using the term "obviously". She was a member of an environmental activist group and engaged heavily with the topic of anthropogenic climate change.

> Sarah: Do you think that this drought is linked to climate change then?
>
> Marie: Yes, I think it obviously is linked to climate change (laughs). And actually I think, I don't know if the majority of people in California would say that. I would say the majority of people who read newspapers, and even our politicians would say that. So, and I do think that California has more awareness around climate change than most of the other states, partly because we've had politicians that have drawn attention to it. Maybe because we have a lot of coastline, which is being threatened, we have 2 airports right here … that will both be underwater, probably within the next 2 decades, so (laughs).

In the same region, a farmers' market organiser, Lennard, pointed towards the sinking of the ground in the Central Valley. He reflected on the severity of the drought and the

consequences this entailed to explain his view that there was a link between the drought and climate change and he also pointed towards science "just look at the science". At a later stage he mentioned the need to reduce emissions and switch to renewable energies, suggesting that his view was that human emissions had influenced changes in climate.

> Sarah: Do you think that the drought is being made worse by climate change or do you think they are not linked?
>
> Lennard: Oh personally I think it is.
>
> Sarah: Yeah?
>
> Lennard: But I mean the hotter it is the more water in California, you know, like the Central Valley is sinking 'cos they are pumping so much water, 'cos there's less water coming, we had terrible droughts through the winter and even if it rains, it's not cold enough for snow pack in our mountains, so it all kind of goes quickly, so our reserves aren't there, I don't think you can deny it, you know, just look at the science, so … I think some ideologues might have something against it, but I think for the most part it's, people are feeling it, I mean if you live in California and you deny climate change, I don't know how, I mean we have water restrictions here.

Another woman in the same region also maintained that there could be a link to anthropogenic climate change, while referring to other social practices, such as agriculture, as an important contributor to drought and climate change. Her reply connected the drought not only to changes in nature, but also related it to political decisions and social water practices – a point that was mentioned by other respondents as well (see chapter 4). She pointed towards the complexity of the issue and multifaceted links between social practices that exacerbated drought and caused climate change, while climate change also exacerbated the drought.

> Sarah: Do you think that it (drought) is linked to climate change or do you think it is just a dry area here?
>
> Willow: I think it's linked to climate change in that the amount of carbon dioxide of the greenhouse gases that are emitted, through just say, how the people are using cars, really, really bad agricultural practices that aren't sustainable, a lack of the ability of the earth to sequester carbon sufficiently enough, are all contributing to these things, but I guess in essence I think it is due to climate change. But I think the severity of the drought is probably as much to do with bad agricultural practices which kind of, yeah are still part, still part of the issue, still part of climate change, but just a complete disregard for sustainable practices when it comes to land management and the amount of agriculture that is going on and just done really, really badly and unsustainably.

The above extracts illustrate that although many opinions were expressed cautiously, there was a substantial awareness among people across different regions of California of

a possible link between the severity of the drought and climate change. People used a combination of media and science sources and their own experience of warmer temperatures and other changes to support their understanding of a link.

Uncertainty and emotion. It is also important to acknowledge that some people had not considered a link between drought and climate change. In the following extract it is interesting to note that Frank mentioned a gut response to the suggestion of a link, illustrating the kind of intuitive and spontaneous reactions people reported. He might have already been open to the idea of climate change, but this extract shows how people use emotions and potentially social cues, to guide their response.

> Sarah: Do you think it is that, do you think that there is a link to climate change?
>
> Frank: Linked to climate change and the drought? Let's think about that one. Is there any climate change and the drought? It's a tough question. It's a really good question ... Do I think there's a link between climate change and the drought? My gut tells me just to say yes. Not just to say it, but that it is yes.
>
> Sarah: That it is?
>
> Frank: Yeah that's just, you know, I don't think I have actual reason why, but does there need to be a reason why? I think yes or no is a good indication.

Rebecca, a young woman in LA identified the main problem as being an inadequate water source. Further, she mentioned that the topic of drought did not grab young people's attention and "hearts" (pointing to the role of emotions). This extract illustrates how she discussed the role of technology and innovation. Although she was open to the idea that the drought might be linked to climate change her main focus was on the necessity for more reliable and alternative water sources. She suggested introducing desalination projects, so that there would be no risk of running out of water, even if there were not a hard winter. At this point of the interview she was commenting on the fact that people were no longer automatically served water in restaurants because of the mandatory water restrictions, but instead had to explicitly ask for it.

> Rebecca: So in one aspect I understand, because we want to save our resources, but in another aspect, we have a lot of brilliant minds on the planet, so I think we should learn how to convert salt water or something, because I think it's a little ridiculous, and it definitely does affect us, you know, because we need water, our bodies are mostly made up of water … but in general, yeah, pop culture is the most popular thing and especially in the younger generation, unless it's something that really grabs our hearts, unlike recent killings, or something that grabs your heart, then everyone pays attention to it, but when it's something like a drought, people think it's just gonna fix itself …

Sarah: Do you personally think that it has anything to do with climate change?

Rebecca: Maybe about 30%, but in most I think, well, well maybe it does, now that I think about it, maybe it does, does climate change, but I think the water source is the problem, as well, the source where we get our water, cause I know, I read somewhere where we get our water from ice glaciers or something after they melt and we get, that's our source of water or something like that, I just think we need more of a different idea, of how to get it, you know, 'cos, what if it doesn't, the winter there isn't as, you know icy, you know, what if enough ice doesn't melt, or what if they don't have a strong winter, you know, you have to plan, that can't be your only source of water.

Drought is not linked to climate change

In this section I discuss the views held by people who mostly thought that the drought was unrelated to climate change. They tended to think that climate change was not caused by humans or was not occurring at all. There were two main ways in which people usually argued against a link between the drought and climate change. One had to do with identifying a different cause of the drought, such as inappropriate water management. The second line of reasoning had to do with California's dry climate and the knowledge of previous droughts, which led them to conclude that droughts were cyclical and natural. A public works director and reserve police officer in a small town in the Central Valley explained the drought through a lack in rainfall and the wasting of water.

Sarah: And do you think that the drought is at all linked to climate change? Because I heard the Governor Brown talk about that, but

Keith: No, I don't.

Sarah: You don't, right. It's more like a natural?

Keith: It's a result of, you know, less than adequate precipitation and it's also a result of, just wastefulness and over-pumping.

Sarah: Yeah, ok.

Keith: Water waste.

Keith's suggestion that drought occurred as a consequence of less than adequate precipitation left unclear why he thought that there might be less precipitation. Further, in his view the role of water waste and over-pumping pointed towards the drought as a consequence mostly of social practices (see chapter 4).

Another person in the Central Valley who was a wholesaler of drilling and well materials and whose business was enhanced by the drought, questioned - as did several

others - any potential link between climate change and the drought by referring to California's dry climate, past droughts and natural cycles.

> Mike: This is the third drought, I'm fifty-three and this is the third drought in California I've gone through, it's cyclical.

He did not acknowledge that anthropogenic climate change could have already been affecting California's climate over the past 50 years. Later he discredited other people's opinions by stating that they had less experience of the cyclical nature of rainfall because they lived in towns or cities.

> Sarah: Because you said that there's a lot of rain but I've also heard people saying that it hasn't actually been raining enough, so maybe even bigger dams wouldn't fill up because there isn't more rain …?

> Mike: I mean these people that are telling you, they're stupid, I mean the rains will come back, I mean we've already seen moisture this year, we've had droughts before, but you've got to remember a lot of the people you're talking to, I would imagine, they live in town, they don't, they haven't experienced it, whereas … I have lived this (my) whole life, having to deal with water.

He argued that what was causing water problems in California was not climate change but rather a lack of storage and too many people. Then he pointed towards his own experience of the fact that it had started snowing again in the east of California. He gave precedence to his own experience rather than trusting in meteorological science.

> Mike: I mean people that are feeding you that, I mean that's just, that's ignorance and you know, these meteorologists have yet to be able to predict stuff and I don't know how many times I've seen in my life time "oh it's an El Niño, oh it's an El Niño, it's this, it's that", they have no fucking, oh I'm sorry, they have no clue.

Another person, Martin, used El Niño to argue that droughts were not linked to climate change and were cyclical (in line with Mike). He responded to an e-mail of mine as a member of the Republican Party in a northern coastal city. In contrast to Mike, who was sceptical of meteorology, Martin later invoked science to back up his argument, also pointing towards California's dry climate and previous droughts.

> Martin: I don't know what usual is, we have one (drought) every, you know five or ten years, we live in a desert so it's common, this one has lasted maybe a year longer than frequent, but I don't think it's particularly unusual in the history of California … This drought is kind of in a mechanistic way it's driven by the El Niño cycle … I mean the fact is we're gonna have a good El Niño (this winter) and it's gonna you know dump us a whole lot of snow and rain on us and end this drought, does that mean that anything has happened in climate change? No, absolutely not.

Another person in the Silicon Valley area described how some years there was water and other years there was not and therefore saw water issues as being related to problems of storage.

> Charles: If you grow up here there's always been more or less of a desert, so we don't, (we're) frugal with our water, with your garden, what not, but in the last year, it's been really on Facebook, in the newspaper every now and then I'll read an article about the water, the shortage and pictures of dried up reservoirs. A couple of years ago we're full of boats and now we are full of dried up logs. There really is a storage problem, everything's empty, not everything but a lot of the above groundwater's dried up.

When I asked whether he thought there was a link between the drought and climate change he commented that he could not perceive sea-level rise and that he was sceptical and would not simply believe what others told him.

> Charles: Empirically my own experience, I can't tell, I don't see the seas going any higher than they have been, I mean I try to keep an open mind, I'm sceptical, but I listen … but just cause somebody tells me … the jury's out, who really knows … We are definitely in a drought, but these things do cycle here.

A woman who worked for a water utility service in an eastern mountainous town in California suggested that views on a link between drought and climate change varied depending on people's age, because older people had experienced previous droughts and were therefore more likely to treat it as cyclical (which is in line with Mike's above reference to his own age).

> Chleo: Well, you know, it's interesting I think to answer that question you have to kind of look at our community in terms of age groups (laughs). So we have a large older population here and then we have like a large younger population and what I've found is anyone in their, you know, probably in their 40's and younger is concerned about climate change, believes that it's happening and believes that a lot of the things that we're seeing are direct effects of climate change. Whereas a large part of the older population does not think that so much, because they've been alive long, to see us go through other periods of bad drought and dry winters and things like that so a lot of, I get the impression that a lot of people in the older age group view this as normal, cyclical you know normal cycles, normal weather cycles and less linked to climate change.

To summarise, some of the predominant reasoning used to suggest that the drought was not linked to climate change involved the notion that droughts were cyclical and natural because they have happened in the past. In relation to this point, the importance of location and personal history was mentioned, suggesting that because older people had experienced previous droughts they tended to be less convinced that the current drought

was linked to climate change. Other explanations that participants gave for the occurrence of drought related, for example, to issues of water storage, inadequate water sources and social practices, such as waste, as well as distrust of meteorological science and overpopulation. It should be noted that people who did see a link between drought and climate change also acknowledged the importance of social water practices and waste.

I'm definitely not a scientist but…

Some people excused themselves or downplayed their opinion or its validity by commenting: "I'm definitely not a scientist but …". People experience events, but not the causes of those events, in which case science is sometimes used to investigate causality. The caution that some people expressed, suggests that people might have felt that their experiences and opinions were less valid because they did not have scientific training or evidence to back them up.

For example, two men working on a pier in a smaller northern coastal city described elaborately the kinds of changes they had noted, such as warmer ocean temperatures, leading to higher acidic algae content, acidification of crabs and fish, which in turn affected the whole upward food chain and fishing industry.

> Mark: It's all the bait fish too, all the anchovies, all the little fish that eat, you know, all the algae
>
> Evan: So you'll see sick birds and
>
> Mark: … and then later on it works its way up the food chain and then you'll start seeing sick birds and maybe even sick sea lions down the road …
>
> Sarah: So it's not just that, so actually I misunderstood you, when you said that it's not that there are less crabs around, it's that the crabs are (inedible)
>
> Evan: Yeah, you just don't wanna eat them
>
> Mark: You don't wanna eat them, because you get sick

Despite their in-depth knowledge of local changes in the ocean, they ended up qualifying their answer by adding that they were not scientists.

> Sarah: Wow. And you think, you think that is linked to climate change?
>
> Mark: Oh yeah.
>
> Evan: It definitely could be, yeah.
>
> Mark: Definitely a possibility. We're not scientists but (laughing) …

Similarly when I asked Larissa whether she thought that more needed to be done to address climate change, her response implied that her opinion was not so important or valid because she was not a scientist.

> Larissa: Absolutely … You know, I'm definitely not a scientist but, you know, I mean if we know that there are certain issues that, are creating a very rapid deterioration, that they should be addressed immediately.

Dave's comment below illustrated an uncertainty about how to assess scientists' arguments. On the one hand he referred to scientists as much smarter than himself, but he did not quite know which side of the 'science' to believe.

> Dave: I kinda have my doubts on the climate change, if you look at the long time history there's always been spikes in the climate, and then it drops back down, and back up and back down. I'm not smart enough to figure it out (laugh) but I read a lot of stuff and I know it's happened and I'm not saying in the last 20 or 30 years, but there's been spikes in the temperature over the history and then it always regulates itself. So, it could be happening, I don't know … I've read where it's happening from scientists that are much smarter than me, and I've read from other scientists that say it's not happening, so who, which one do you believe?
>
> Sarah: Right, ok, so you don't think that climate change is necessarily happening or that it's, even if it were to be happening, that it's caused by human emissions?
>
> Dave: I'm kind of 50/50 on that (laughs) I just, you know, I don't, I try to get somewhere in the middle, where I don't completely believe the one's that say there is and I don't completely believe the one's that say they're not. So, who knows?

The extracts may represent cases where people do to not quite trust their own judgement and experience, because they are not scientists and some do not know who to believe. Although the statement 'I am not a scientist' could 'just' be a rhetoric device, this interpretation would still raise the question as to why such a rhetoric was being used. One disadvantage of the heavy reliance on science in modern Western societies may be that lay people's knowledge and everyday experience is not regarded as scientific and might therefore be considered less important. As a consequence lay people may not feel qualified to make judgements about climate change and refer any such judgements to 'people with knowledge' (i.e. experts, such as scientists and politicians) which simultaneously could lead to the displacement of responsibility.

Drought did not appear to change people's minds on climate change

One of the key questions of this research was to investigate to what extent personal experience of drought might influence a change in views on anthropogenic climate change. This question developed partly in response to the suggestion that Western countries are not taking more action on climate change mitigation because they are not (yet) affected. From the observations and interviews in California it appeared that this was not the case and I present some of the evidence for this below. I acknowledge that there is no straightforward way of testing this, let alone of establishing any causality, if there were such an effect. There are also difficulties in terms of how to study an omission, i.e. something that is not happening, changing or being said (Norgaard, 2011; Zerubavel, 2006). However, I noted that nobody I spoke to in the interviews or other conversations ever mentioned that the drought had changed their view on climate change. Several responses would seem to support the suggestion that people's views about climate change were not drastically changed by the experience of drought. Betty (living in a large northern coastal city) exemplified how someone who already believed in climate change only saw the drought as "proof".

> Sarah: So, do you think that experiencing the drought has changed your views on climate change?
>
> Betty: No, I always felt it was.
>
> Sarah: You always thought, yeah?
>
> Betty: Yeah, it's pretty, it's pretty, they've been warning about this for quite a while, good scientific studies always said, something terrible's about to happen. Why would I not believe that? …
>
> Sarah: So do you think, experiencing the drought, being here and living in the drought is making people think more about climate change?
>
> Betty: Maybe. I think it might, you know. But I think most of us, already have believed the scientific studies, saying that it's, yeah.
>
> Sarah: Right, so people already believed in it anyway?
>
> Betty: Right, right.
>
> Sarah: It's not like
>
> Betty: The drought is just proof. You know. We're like the first sufferers of climate change really.

Martin referred to his attitudinal background and replied that the drought was not linked to climate change. At the beginning of this extract he was disputing the link between emissions and anthropogenic climate change. Like people who maintained that there

was a causal link, he also claimed to draw on scientific evidence to back up his argument that there was no link between emissions and climate change.

> Martin: No doubt that that (CO_2) has a tendency to capture temperatures, but beyond that, the direct correlation of that to any, even longer term change in, in the temperature of the earth, the data is not as clear as the advocates would have you think and the source, the causation is not that clear and what's not at all clear, is the logic of, ok, so what can you do about it and what would that cost and what's the trade off? So people are, I think I'm speaking for a lot of people when I would say that, yes we should do what we can to stop, or to reduce CO_2 emissions, on the other hand, let's understand what really causes climate change and let's look at the total, global picture and what China does and what India does and not just commit suicide economically because it feels good. So kind of with that attitudinal background do I think the drought has much to do with climate change? The drought is a predictable, short-term you know set of weather conditions, the climate is a long-term, you know, circumstance driven by the other large factors, so I would say no. The governor (who is a Democrat) has said yes.
>
> Sarah: yeah
>
> Martin: I think he, I think contrary to the frequent politisation of things, I would like to say that Republicans are the Party of science, and I would say the science says no … there's really, you can't make that connection.

Martin suggested that carbon emissions do trap heat, but used science discourse to suggest that there was no evidence of emissions causing long-term increases in global temperatures. His emphasis, however, seemed to be on the question of how to respond to emissions. This highlights that the implications of how to respond to a situation are not given within science. Martin also referred to China and India as significant contributors to emissions, and suggested that emissions should be reduced to an extent. Both of these points seem to contradict his previous argument that the role of carbon emissions is not clear, since if the latter were the case, then China and India's emissions would not be of relevance. His ultimate concern seemed to be to avoid 'committing economic suicide' and it appears that, with this in mind, he drew on other factors (China's and India's emissions) and scientific 'uncertainty' to argue for the outcome that he supported.

A woman in the Bay Area who worked and volunteered for an environmental group commented regarding a link between drought and climate change:

> Rose: I don't see how people could escape thinking that it has to do with climate change, but, I don't know.
>
> Sarah: Yeah, but then, in your circles people already believe in climate change?

> Rose: Oh yeah, they already believe in it so, yeah … I think some people feel hopeless and then therefore I think that contributes to them not connecting the drought with climate change, because you think that it's already happening and there's nothing we can do about it.

The feeling of hopelessness and lack of efficacy were suggested as reasons why people might shy away from drawing a link. Later I asked Rose whether she had noticed a change in awareness, more interest or an increase in membership in her environmental group and she replied:

> Rose: I guess I would say I don't really know, but in some ways, I don't think so yet, like, I still think we are getting the people who cared anyway.

The conversations seem to suggest that experiencing the drought did not change people's mind on whether anthropogenic climate change was happening. None of the participants told me that they used to believe that anthropogenic climate change did not exist, but now they were convinced it did, or vice versa. Instead the drought either seemed to confirm people's views if they already believed in climate change, or if they did not, then the drought was explained in other ways.

Discussion

People who believed that there was a connection between the drought and climate change drew on their own experiences and also on science discourses. They pointed towards warmer temperatures, poor rain and snow conditions and suggested that CO_2 emissions brought about by humans were bound to have an effect at some point. However, they also acknowledged the role of water practices in affecting water availability. These findings are congruent with Armah et al. (2015) and Ruddell et al. (2012) who found that participants accurately perceived increases in temperature in their local surroundings.

In contrast, some of the predominant reasoning used to argue that the drought was not linked to climate change involved the notion that droughts are cyclical and natural because they have happened in the past. This reasoning has previously been noted in relation to climate change but is flawed, since just because something has happened before, it does not follow that the causes always remain the same:

> The most common fallacious argument is that current climate change must be natural because climate has changed naturally in the past. This myth commits the logical fallacy of jumping to conclusions. It's like finding a dead body with a

knife sticking out of its back, and arguing that the person must have died of natural causes because humans have died of natural causes in the past. The premise does not lead to the conclusion. (Cook, 2015, para. 6)

In relation to this point, the importance of demographics and personal history was mentioned by participants, suggesting that because older people have experienced previous droughts they tended to be less convinced that the current drought was linked to climate change.

Other reasons used to argue that the drought was not linked to climate change were inadequate water storage and sources, as well as bad water practices, such as waste. There was also mention of distrust of meteorological science and the suggestion that there was overpopulation. This line of reasoning was consistent with one discussed by Otto-Banaszak, Matczak, Wesseler and Wechsung (2011) who noted that in their interviews with adaptation experts in Europe: "The interviewees did not blame global warming for the increased frequency of climate extremes as such but more often attributed them to the way people have been managing land and other natural resources" (p. 220).

Thus it appears that even when people begin to experience some of the effects of climate change, they do not necessarily draw a connection to the latter, since previous understandings influence their interpretation of the events. The explanation of drought through natural cycles is also in line with Ungar (2000) and Whitmarsh's (2008) suggestions that changes are lost to people amongst the natural variation in temperature and occurrence of extreme weather events. But, as noted above, other participants did perceive there to be hotter temperatures and an increase in the severity of drought conditions and they linked these to climate change. The present results are in line with Pearce et al. (2010) who pointed out that some people in Australia interpreted drought as part of natural cyclical variations, whereas for others climate change was a present risk.

A dependence on scientific understanding was evident, as several participants qualified their responses, by saying that they were not scientists. This could be taken to imply that their opinion on the drought, its causes and consequences were less relevant, because they were not scientifically trained. The dominance of Western scientific claims to knowledge and the associated language used, points towards the potential marginalisation of other epistemologies, such as experiential, local and indigenous ways

of knowing (Agrawal, 2002). The present findings indicate how people relied on science to understand and define their surroundings and possible causes. As Beck (1992) suggested, many modern risks require science to track long-term effects and establish a cause:

> … presumptions of causality escape our perception. They must always be imagined, implied to be true, believed. In this sense too, risks are *in*visible. The implied causality always remains more or less uncertain and tentative. Thus we are dealing with a *theoretical* and hence a *scientized* consciousness, even in the everyday consciousness of risks. (p. 28)

One of the dominant way of discussing climate change is in scientised narratives, while the direct experience and tracking of changes noted by many indigenous communities (e.g., Alaskan native communities) has not received similar acknowledgement (Callison, 2014).

The side-comment 'I'm not a scientist' may seem insignificant, but I heard it repeatedly. It is noteworthy, as it was already evident that the people I asked were not scientists – I had not sought them out as scientific experts – I had asked about *their* experience and opinions. A consequence of this reliance on science to interpret the changes that people note around them, could be that definitions of risk are relegated to those with a certain level of authority and training, such as scientists. Moreover, Beck (2009) questioned: "… who decides what is and is not a risk?" (p. 24) highlighting that relations of definition are also relations of domination. As long as definitions and understandings of climate change are relegated and dominated by scientific experts and people in authority (e.g., politicians) the other experiences and changes noted, or opinions that are formed, might be given less importance.

The experience of drought in California did not appear to change people's minds on climate change. Either participants already believed in climate change in which case the drought reaffirmed their beliefs and added to their concern. Alternatively, if they did not think that climate change existed or was caused by humans, then they tended to interpret the drought as part of natural cyclical changes, or as a consequence of bad water practices. Seemingly, people interpreted the drought using their already existing frames of reference and accommodated the drought into their worldviews. This could be an example of biased assimilation, whereby people seek out and find more convincing information that supports their beliefs (Lord, Ross & Lepper, 1979; Whitmarsh, 2011).

Corner, Whitmarsh and Xenias (2012) showed that participants assessed the reliability and credibility of information on climate change in line with their pre-existing beliefs (sceptics were more convinced by the sceptical compared to the pro-climate change article, and vice-versa). In a longitudinal study in the United States, Myers, Maibach, Roser-Renouf, Akerlof and Leiserowitz (2013) demonstrated the presence of both experiential learning and motivated reasoning. Consistent with experiential learning, the self-reported perceived experience of global warming influenced the conviction that global warming was occurring. In line with motivated reasoning, it was also the case that prior beliefs influenced the perceived personal experience of global warming. Notably, those with lower global warming engagement were more likely to be influenced by perceived experience than by existing attitudes, while those who were more engaged in the topic of global warming (both for or against) were more likely to evaluate their perceived experience in alignment with their prior views.

Importantly, in the present study, people sometimes mentioned similar events or narratives such as past droughts or scientific evidence to back up different points of view. It appeared that 'evidence' was interpreted differently depending on existing beliefs. This is also consistent with research on cultural polarization, which suggested that: "People with different values draw different inferences from the same evidence" (Kahan, 2012, p. 255). Kahan, Jenkins-Smith and Braman (2011) showed a strong correlation between views on scientific consensus and individuals' cultural values. In an experimental study they found that participants were more likely to judge as expert, someone whose position on a risk-related topic (global warming, nuclear power or gun control) supported their views.

The findings of the present research suggested that existing beliefs about climate change were important in informing how people made sense of the drought. This finding is congruent with Whitmarsh (2011) who showed that prior environmental values and political views were the strongest predictors of beliefs in the reality and severity of climate change (those with more right-wing views and lower pro-environmental values were more sceptical of climate change). Education and self-reported knowledge were not significant predictors of uncertainty and scepticism about climate change. The author concluded that: "Critically, more information will not engage the most sceptical groups, since information will tend to be interpreted in

relation to existing views, and entrenched views are very hard to change" (p. 699). According to the present results a similar point seems to apply not only to 'information', but also to the processing of personal experience and interpretation of local climate change.

Consequently, it appears that information and events (whether they be in form of experiencing drought or news coverage) were interpreted in line with what suited existing worldviews. The member of the Republican Party, Martin, used various claims about scientific uncertainty regarding the causation of climate change from emissions, as well as other high-polluting countries, ultimately to argue that the economy should not be damaged by mitigation. Klein (2014) examined this line of reasoning in detail, proposing that 'the right' realised what it would mean for the economy, if they were to accept the evidence on anthropogenic climate change. She proposed that, given this realisation, people on the right had to disagree with the science, because otherwise it would have undermined and threatened their worldviews and the whole economic system that those views favoured.

Klein (2014) attended a conference on climate change by the Heartland Institute, a free-market solution oriented think-tank based in Chicago. In her examination of the conference she remarked: "Yes, there is a pretense that the delegates' rejection of climate science is rooted in serious disagreement about the data. And the organizers go to some lengths to mimic credible scientific conferences…" (p. 33). But, she went on to note, that the various theories presented were already debunked and that the delegates contradicted each other. One delegate questioned whether warming was even occurring, the other suggested there was warming but that it was not linked to greenhouse emissions and yet another conceded that there was warming due to CO_2 but argued that the impacts were minimal and required no further action. This is somewhat similar to Martin who used various lines of argument which seemed to contradict each other, such as that emissions do not cause climate change, but emissions should be reduced and China and India are also to blame. In line with the logic followed by Martin, Klein (2014) argued that underlying a rise in denial of climate change among staunch conservatives was that:

> …they have come to understand that as soon as they admit that climate change is real, they will lose the central ideological battle of our time—whether we need to plan and manage our societies to reflect our goals and values, or whether that task can be left to the magic of the market. (p. 40)

Similarly, McCright and Dunlap (2011b) found what they called a 'conservative white male effect', whereby the latter were more likely than other adults (of a nationally representative sample in the United States) to deny climate change, especially if they self-reported having a good understanding of global warming. One of the explanations the authors concluded with was that:

> … conservative white males have disproportionately occupied positions of power within our economic system. Given the expansive challenge that climate change poses to the industrial capitalist economic system, it should not be surprising that conservative white males' strong system-justifying attitudes would be triggered to deny climate change. (p. 1171)

Klein (2014) summarised: "In other words, it is always easier to deny reality than to allow our worldview to be shattered …" (p. 37) when, for example, confronted with inconvenient scientific evidence. She suggested that therefore conservatives: "… bridle before facts that call the dominant economic system into question…" (p. 37).

Another explanation as to why some people do not draw a link between drought and climate change, was offered by Rose, who speculated that it had to do with feelings of hopelessness and helplessness, whereby people felt there was nothing they could do about climate change (the importance of which was discussed by Norgaard, 2011). Perhaps helplessness is one of the reasons why people, despite knowing about climate change, do not seem to integrate this knowledge into their everyday lives: "Across many sectors of US society, people know facts about climate change that they believe to be true, but they live their lives without integrating this information into their decision making, political activities, or sense of daily reality" (Norgaard, 2011, p. 204).

One of the particular contributions of the present study was that it employed qualitative research to examine the complexity of interrelated beliefs and the reasoning that people used to support each set of beliefs. Many previous studies have relied on quantitative data. Although the current research does not provide a quantitative assessment of the prevalence or distribution of perceptions, it does illustrate some of the patterns and lines of argument to be found in relation to drought and climate change in California. The interpretation of drought seemed to depend upon a person's previous climate change beliefs. This suggests that attributing inaction on climate change mitigation, to the distance of impacts in Western countries, needs to acknowledge that lack of experience of climate change may not be one of the decisive factors. Instead it may be that political beliefs, personal biography, one's environment and social and

economic factors have a decisive influence on how the impacts of climate change are interpreted locally.

The explanation of inaction due to a lack of tangibility and immediacy has also been criticised for implying that climate action arises primarily out of self-interest (as a consequence of experiencing the negative consequences personally) and de-emphasises the concern over climate-justice which can also drive action on climate change (Isenhour, 2013). The explanation is further problematized by cases such as Sweden, where the experience of negative consequences of climate change is rated as low, but people are amongst the most concerned and pro-active (Isenhour, 2013).

The present research relied mostly on interview data and if they had not mentioned the topic already participants were prompted to reflect on the potential causes of the drought and on climate change specifically. More observational data and ethnographic research would have allowed a better judgement of the extent to which climate change occurred in everyday conversation and the degree to which it was mentioned in relation to drought. However, in the interviews climate change was sometimes mentioned without prompting and participants also referred to everyday conversations they had on the topic. It could also be of interest to follow interviews up at a later point in time.

Future studies could further investigate how the experience of climate change impacts on beliefs and especially on adaptation and mitigation behaviours. Further, a quantitative assessment of the moderating effects of previous climate change and other beliefs, on the interpretation of drought in California, would be useful. Future research could also examine more generally under what circumstances the experience of extreme weather events, or other climate change impacts, does lead to changes in concern over anthropogenic climate change (as Capstick et al., 2015 found), as well as to changes in behaviour.

In conclusion, those who thought that drought and climate change were linked, argued for example that there had been a noticeable rise in temperatures, drew on science and/or followed a general belief that humans impact the climate. Nonetheless, these participants also acknowledged the role of social water practices in water issues. In contrast, those who did not believe there to be a link between drought and climate change argued that droughts were natural and cyclical and/or that there was inadequate

water storage. Both sides sometimes used science narratives to support their argument. It did not appear that the experience of drought changed people's minds on climate change. People tended to interpret their experience of the drought according to their already existing opinions on climate change. If they previously believed that climate change was happening they were more likely to think that the drought in California might be linked to it, but otherwise they did not. The investigation of the relationship between the experience of climate impacts and changes in opinions and actual mitigation action merits further research.

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- Chapter 6 -

Discussion

In this thesis, through a combination of separate but inter-related chapters, I have examined how people relate to climate change. In the Introduction I laid out both my personal stance as to why I care, and my position on various scholarly debates. I described the context for my research, by outlining some literature on the relationship between capitalism and climate change, as well as how capitalism influences humans' thoughts and behaviour. I raised a variety of questions, such as how the current dominant economic system might express itself at the individual level.

One example of this, the case of pro-environmental individual behaviour change approaches, was examined in more detail (please refer to the research reported in chapters 2 and 3). This approach is one which largely locates the problem of, and solution to, excessive carbon emissions in the individual, but leaves unchecked political and economic factors (Kent, 2009; Maniates, 2001; Norgaard, 2011, 2017; Shove, 2010; Webb, 2012). In Webb's (2012) words: "Neo-liberal micro-economic governance, through behaviour change technology, offers limited and largely self-defeating means of transition to a sustainable society" (p. 121).

I went on to question the suggestion that the failure to reduce emissions in the West is due to climate change's future and distant (from the high-emitting Western countries) consequences. Although mentioned at the outset, I have, towards the end of my programme of research, increasingly come to realise the particular relevance to my research of the notions of 'omissions' and 'silence' (see Norgaard, 2011; Zerubavel, 2006). In the Introduction I also outlined my methodology and described my samples.

In the first two chapters I concentrated on people's views and responses to approaches to climate change mitigation. Chapter 2 consisted of an exploration of the different mitigation strategies which participants mentioned and their views on different actors' responsibility to reduce emissions, were examined. Talking about climate change mitigation necessarily involved conversations about understandings of climate change, such as whether it was even occurring and whether or not it was human-caused. Although this was not the focus of the research, it showed that for some people these questions were still open. The results also indicated that these participants (students in

the UK) were not perceiving climate change to be affecting them. The persisting doubt about the evidence on climate change, even amongst these university students, might be testament to the power of the denial industry (Oreskes & Conway, 2010). Notably, however, even the students who raised doubts about the existence - or about the anthropogenic nature - of climate change, nonetheless suggested several measures to reduce emissions. These measures were seen as positive for several other reasons, such as the reduction of air pollution or (in the case of cycling, for example) the benefits to people's health. This supports the approach taken by research and campaigns which have suggested shifting towards an emphasis on viewing climate change mitigation as conducive to quality of life, rather than as involving personal sacrifices (see also Klein, 2014).

The results from chapter 2 also showed that individuals, the UK government and corporations were all, to some extent, seen as having responsibility for reducing emissions, but different interests and power relations were suspected of impeding these actors' willingness to respond accordingly. Issues were also raised concerning distrust of government and corporations and the extent to which they are committed to change, as opposed to being geared towards economic growth and profit. The actual changes that participants suggested for the individual, governmental and corporate level of mitigation strategies, were also of interest because of the possibilities that were not mentioned. Regarding the individual level, participants mentioned for example recycling more, turning off unused devices, using more public transport, walking and cycling more. These findings were consistent with those described by Maniates (2001) who mentioned that among the most popular 'solutions' which students suggested to global environmental issues were planting a tree, recycling and riding a bike instead of driving a car. In the present findings there was little mention of engaging in political activities such as protesting and pressuring politicians, energy companies or other businesses.

The UK government was seen as having responsibility to reduce emissions, for example by providing better information and education to the public, investing in renewable energy and by regulating high polluting industries. However, several participants were sceptical whether this would happen, due to the level of collusion between government, corporations and industries, consistent with Kent's (2009) proposal that:

… people also understand global degradation as symptomatic of weak political action (Räthzel & Uzzell 2009, p. 329), so not only do individuals perceive an unacceptable level of action from governments on climate change mitigation they are also cynical that governments are genuinely serious about climate change as it is understood to be against their economic interests (Darnton 2006, p.24; Accountability and Consumers International 2007). (p. 143)

Participants also viewed corporations as having responsibility to reduce emissions, for example by reducing waste and recycling 'what they can'. However, several participants were again sceptical about the likelihood of corporations changing, given their profit motive. This indicates that there was some awareness of corporations' economic concerns and the framing of climate change mitigation as a threat to capitalist organisation.

Several participants raised the notion that there was a clash between environmental and corporate interests. They saw a dichotomy between corporations' profit and growth motive and environmental well-being. One recurring attempt to resolve this opposition was the suggestion of win-win solutions, whereby corporations somehow needed to be incentivized to reduce emissions, but would still be able to continue making a profit. The profit motive itself often remained unquestioned. The win-win approach is in line with larger societal discourses and approaches which seek market mechanisms to address environmental destruction (Maniates, 2001). These findings seem to support the suggestion by Norgaard (2011) that people are somewhat sceptical and disillusioned about the political system's ability to take action and reduce emissions. However, this does not seem to have led to a challenging of the values, norms and assumptions that dominate society (e.g., profit) or the resolution of taking matters into one's own hands (beyond recycling).

When protest and more fundamental structural level changes were raised, they were supported, but seen as unrealistic and unlikely. This again was in line with Maniates' (2001) findings that:

> When we asked our students … why, after thirteen weeks of intensive study of environmental problems, they were so reluctant to consider as "solutions" broader changes in policy and institutions, they shrugged. Sure, we remember studying these kinds of approaches in class, they said, but such measures were, well, fuzzy, mysterious, messy, and "idealistic." (p. 36)

This underlines that one crucial factor in the motivation for action and change, is the feeling and belief that something can be done (Gamson, 1992; Norgaard, 2011, citing

research by Immerwahr, 1999). In the research reported in chapter 2, when giving reasons for inertia, participants explained for example, that people did not know enough (see also Maniates, 2001) or were lazy because the behaviour changes were seen as inconvenient or less important compared to 'daily worries'. Importantly, the notion was raised that people were not being affected enough to begin to care and act more towards climate change mitigation, which partly informed the idea for my qualitative research in California. The implication of this is that several participants viewed humans in general as self-interested, only willing to act when they were personally affected, which might indicate one assumption that some people have internalised about human nature.

To my knowledge this study is the first one to examine qualitatively what a sample of UK citizens think should be done to mitigate climate change. This is important because understanding what the public thinks should be done to mitigate climate change can inform policy approaches to be in line with public opinion and therefore receive public support. Further, understanding what people think should be done to mitigate climate change also elucidates which kind of mitigation strategies the public are aware of, which ones have been successfully disseminated and which ones have not. Campaigns can then be developed and targeted more specifically at broadening the public's understanding of a variety of possibilities for climate change mitigation. Further, the study has contributed to research by examining some of the underlying assumptions that some people in the public make, for example corporate profit is taken for granted in win-win approaches to the reduction of carbon emissions. The study reported in chapter 2 also expands existing research by examining the relationship that people see between different levels of action. This combines an exploration of both personal and individual responsibility for action as well as how it relates to the responsibility of structural level actors, such as government and corporations. This means that beyond exploring psychological and individual level barriers to climate change mitigation (such as laziness as mentioned by some participants or the dominance of issues that are perceived as more immediate and pressing [Gifford, 2011]) participants explored some of the barriers of action on climate change mitigation posed by infrastructure, political and corporate imperatives. For example, they discussed how the profit motive and need for economic growth is contrary to environmental well-being and climate change mitigation.

Using an experimental design, chapter 3 focused on the relationship between messaging about individual behaviour change and support for structural level change. Overall, the hypotheses that individual behaviour change framings would reduce support for structural level changes (compared to when a lack of impact of individual behaviour change or possible structural level changes were emphasised) were not supported. However, the literature which criticises the individualised approach to climate change mitigation, discusses long-term societal processes which influence attention, opinions and behaviour. The influence of these long-term processes were unlikely to be changed through the provision of a short information paragraph. It was expected that positive presentations of individual behaviour change detract *attention* and support from structural level change. The studies did show that many participants viewed individual behaviour change as impactful and effective (study 2). Highlighting the impact of individual behaviour change seemed to increase support for prioritising the environment over the economy compared to when the only option was behaviour change versus no behaviour change (study 1). In combination these studies suggest that participants viewed individual behaviour change favourably and as effective.

The main contribution of these studies has been to examine the relationship between messaging concerning individual and structural level mitigation approaches. They have contributed to broadening the discussion of climate change mitigation beyond the need to encourage individual behaviour change to including a wider stance on the need for structural level changes. This is important given that a heavy focus on individual responsibility and behaviour change may limit approaches to climate change mitigation and obscure the need for infrastructure and policy changes which enable and mandate change for businesses and corporations as well. Given that climate change mitigation will require change on many levels of society, it is also necessary for the discipline of Psychology to expand research approaches beyond focusing on individuals to an approach that takes into account wider structural constraints and how views and behaviour relate to societal contexts.

Chapters 2 and 3 raised the debate over a renegotiation of the role of responsibility in climate change mitigation across different levels of action. Future research could further investigate topics touched upon in chapters 2 and 3, by examining how alternative approaches to climate change mitigation might be supported. Webb (2012) suggested closer examination of: "…the circumstances which could

enable subordinated or shadow understandings to develop substantively, to be acknowledged and to be acted on systematically" (p. 122).

The last two research-based chapters referred to fieldwork conducted in California, taken as a case study for the occurrence of climate change in form of drought, in a Western industrialised part of the world. Chapter 4 unpacked Californians' understanding of drought: specifically what changes were perceived and how the drought was seen as related to social dimensions of water practices. The aim of chapter 4 was to examine to what extent people were aware of climate change locally, by focusing on their experience of drought itself (i.e. the focus was not on views of climate change). Californians in many parts of the state were noticing changes. In the cities these changes were less noticeable, but when they were mentioned they related predominantly to the weather. In more rural areas Californians described wider-reaching changes, such as lower lake and river levels and lack of snow. Importantly, living in a larger city shielded people from the effects of drought and people often described learning about drought predominately from the news, rather than from direct experience. They sometimes described that they felt they only had an 'intellectual' awareness of the drought and that it felt distant. Californians' varied interpretations further highlighted the role of different forms of knowing and experiencing, through both direct and embodied experiences and indirect sources. In both cases the media, scientists' and politicians' narratives, as well as infrastructure and location, could influence how people conceptualised the drought. Several people also described experiencing unpleasant emotions in response to noticing changes in their natural environment, which often seemed to back up their understanding of the occurrence of drought. These findings are consistent with Norgaard's suggestion (2011, drawing on Zerubavel, 1997; see also Gamson, 1992) that perceptions of distance are socially created and do not necessarily depend on physical space or time:

> If climate change is felt to be an "abstract" issue in the community, this fact reflects a disjuncture between the local sense of time and place … and the sense of time and place that would be needed to conceptualize climate change for it to seem "real". (p. 76)

A comparable point applies to the understanding of drought in California, where many people even experienced the more local and concrete expression of climate change (in the form of drought) as distant.

Notably, the drought was not just conceptualised as changes in 'nature' (e.g., affecting rivers, lakes and snow) but also as pertaining to social practices of water management which influenced the availability of water and could create or exacerbate drought. Agriculture was named as one of the major offenders in terms of intensive water usage and ensuing shortage. In addition, some Californians suspected profit motives behind the discussion of water scarcity and drought. Finally, there were several effects of the drought which gained little mention and mainstream attention, such as the effects on the Central Valley, where several farm-working communities were already struggling for clean drinking water, and on salmon populations, affecting for example Native American communities.

Chapter 4 highlights how local perceptions of climate change are mediated, for example, by architecture (water infrastructure provides water from taps even in times of drought), by location and by media coverage. Indeed, the importance of the social organisation of attention (which informed the research for chapters 2 and 3) also became apparent in chapter 4. For example, certain experiences and consequences of drought were mentioned more frequently while others remained less acknowledged. Further, people's attention was shifted towards saving water on a personal level rather than talking about the role of 'big agriculture' and fracking or water bottling companies in the state. Moreover, the drought did not mean the same thing to one person as to another, in line with Callison's (2014) statement that: "The communal life of facts matters in explicit and implicit ways—it matters in terms of directing attention (and attentional rest)…" (p. 244) which had important impacts because it influenced people's responses.

Chapter 5 investigated to what extent people viewed the drought as linked to climate change and which reasons they gave for their views. Those who saw a link between the drought and climate change had already believed in climate change prior to the drought and argued that they could see the changes. Those who did not see a connection between the drought and climate change referred, for example, to previous droughts as providing evidence that droughts were natural and cyclical. Previous changes in climate and political views impacted on how people interpreted the drought. One implication of the absence of any reported change in beliefs is that experiencing climate change does not necessarily convince people of its occurrence. This could be because people experience the symptoms and interpret them differently from each other,

rather than experiencing a cause (Beck, 1992). That is, even if people were to notice changes in climate they would not readily be able to attribute them to the emission of greenhouse gases. Further, changes in climate are hidden in everyday fluctuations of weather and temperature (Ungar, 2000; Whitmarsh, 2008). Importantly, these findings cast doubt on approaches which suggest that inaction on climate change is due to the long-term and 'distant' consequences of climate change.

In California, drought was not always talked about as part of climate change and the way people made sense of local changes depended on many factors. The absence of scientific terminology such as 'climate change' does not always imply that there is a disconnection between people's perceptions of local and global events. For example, Cochran (the former international chair of the Inuit Circumpolar Council [ICC], interviewed in Callison, 2014) described that the everyday language used in different communities across the Alaskan Arctic tended to focus on symptomatic changes:

> Certainly, when our elders talk about climate change and global warming, those are not the words that anybody would ever hear coming from an elder's mouth or anybody else … But if you were to ask elders about the changes in ice conditions, and what they have seen in their lifetime, changes in ice? Well, that would be a three-month conversation. (p. 45)

This underscores Callison's (2014) argument about how the meaning of climate change is different across contexts and people. Accordingly, it is not that the labelling of local changes as 'climate change' is always crucial. Instead what might matter is how local changes are connected or disconnected from a larger picture and what implications the different interpretations bring. The research in California suggests that belief in climate change involves much more than just 'experiencing climate change' since changes are interpreted in the local context, e.g., of previous droughts and general dryness, and because people are shielded from drought through the water infrastructure which still provides water. Additionally, people adapt their interpretation of drought to their existing beliefs. Further research would be required to explore the relationship between the experience of climate change and action on mitigation.

The research in California contributes to existing literature in several ways. To my knowledge it is one of the first studies using qualitative methods to explore how climate change, in the form of drought, is experienced in the USA. This is important because climate change does not and will not only affect developing nations now and in the future, but also industrialised countries and will affect people within these countries

differently (Abbott & Wilson, 2015). Further, given the West's higher historical and present emissions, it is crucial to examine how the consequences of these emissions are now experienced. An understanding of how climate change is perceived locally could be employed as a basis for researching how behaviour change might begin to occur as a result of experiencing environmental change. So far only relatively little research has used qualitative methods to examine the experience of drought and/or climate change in Western countries, such as in Australia and Norway (Alston, 2006; Anderson, 2008, 2009; Norgaard, 2011; Pearce, Willis, Wadham & Binks, 2010). Further, it has been suggested that there has not been more action to mitigate climate change (e.g. Giddens, 2011; Moser, 2010) at least partly due to its future and distant consequences. However, this research has shown that even in the case where climate change is having an impact now, such as is the case with the drought in California, there are in fact several other factors which influence the interpretation of the perceived environmental changes. This suggests that whether climate change is perceived as a threat or not, as distant or not, and as requiring immediate and high emission reductions, is not primarily a result of its future consequences, but is rather related to how the issue is framed and acted upon within our societal context.

These chapters interconnect in several ways. Participants interviewed in the UK (chapter 2) viewed their own role in reducing emissions primarily in terms of individual lifestyle changes, rather than in terms of political action. The focus on individual lifestyle changes in conjunction with the sociological literature (Kent, 2009; Maniates, 2001; Norgaard, 2011; Shove, 2010; Webb, 2012) helped formulate the rationale and hypotheses used in all three experimental studies (chapter 3). Further, participants in the interviews from chapter 2 also repeatedly mentioned the idea that 'nothing will change until people really feel the consequences'. Or, as one participant put it succinctly: "…when shit goes down basically, I think maybe people will change and there will be a change in mind set in the general, like, population" (Martin, interviewed for the research reported in chapter 2). This seemed to echo the idea existent in some academic literature (e.g., Giddens, 2011; Moser, 2010; Swim et al., 2009; Weber & Stern, 2011) that inaction on climate change mitigation relates, at least in part, to its 'distant' consequences.

When I arrived in California, I met with similar explanations as to why people were not 'doing more'. That is, several Californians implied that the drought (or the

effects of the drought) were not yet bad enough to bring about more considerable reactions. So even where drought or 'climate change' (even if not conceptualised as such) was being experienced, and despite the introduction of a mandatory 25% reduction in water usage, some people were still pointing towards the notion that people would only change their behaviour once circumstances got worse. This raises new questions as to what degree of 'catastrophe' or change people think is (or actually is) required before more people are propelled into some kind of action. And whether by that point mitigation might be secondary to the need for adaptation and immediate survival (although mitigation might be essential for long-term survival)? Puzzling is the predominance of the idea that many humans in the West will not act until they experience the impacts of their way of life. If the Easter Island example is anything to go by, then people could continue, for example, with deforestation (i.e. deplete their own environment) to the point of cutting down the last tree. That is, people sometimes seem capable of ignoring even the most direct experience of approaching catastrophe and self-destruction (Welzer, 2012).

Future analyses based on the same California fieldwork could examine the relationship between views of the drought and ensuing reported changes in water usage, or lack thereof. In California I asked questions about changes in water practices, but rarely about climate change mitigation. This was because enough intrusive questions had been put to strangers in public spaces, without wanting to open up another door that might make participants feel uneasy, by asking "So what are you doing about climate change?". Upon reflection this shows that even within the research setting, certain questions were avoided, because they were potentially uncomfortable, disturbing and also might not have seemed relevant to the topic of drought. Additionally, there was the difficulty of measuring or observing changes in behaviour, although self-reported changes could have been just as interesting. Nonetheless, in the conversations conducted in California (possibly due to the questions I asked), there seemed to be more of a focus on adaptation, rather than mitigation, as people reported their own water-saving strategies. The relationship between the experience of climate change impacts and changes in behaviour remains to be pursued in future analyses and research.

Parallels between the individualisation of mitigation approaches (discussed in chapters 2 and 3) and the individualisation of adaptation approaches in California, in terms of water saving measures, were noticeable. In both cases, people are being asked

to recycle their waste to reduce emissions or to recycle their water to reduce waste. Even though water-saving practices are desirable, it is notable that fracking is allowed to continue in California (contributing both to emissions and requiring vast amounts of water) (Goldenberg, 2014; Onishi, 2014). The individualisation of responses found both in attempts towards climate change mitigation and adaptation is indicative of a larger underlying culture, which reproduces thinking and action in terms of individualised responsibility. This seems to support arguments that we do not need more information or technological fixes to help resolve climate change, but that a shift in moral values and thinking is required (Callison, 2014; Klein, 2014).

In combination these chapters have numerous implications. They have highlighted that overall the people sampled did know and care about climate change. They were supportive of climate change mitigation on various levels and believed in the effectiveness of individual action (chapter 3), pointing towards the importance of beliefs in agency. However, although people 'know' and 'care' to some degree, ideas for and engagement with mitigation measures beyond individual behaviour change seemed few and far between. A serious consideration of the underlying assumptions, norms and values that have created this climate 'crisis' and the failure of existing approaches to remedy it, are necessary. This could enable alternative ways of thinking and acting to emerge or develop. Although we can learn from previous shifts in values and actions (such as the abolition of slavery) and how they occurred, the case of climate change exists in a new era and context, in which capitalism and consumerism appear to have a tight grip on our values and actions (Klein, 2014). Mitigating climate change requires more than merely understanding attitudes towards it: it necessitates a fundamental shift in how we organise and co-exist in society.

From the interviews in chapter 2 the implications are that more public discussion as well as working examples of infrastructural changes could help promote public imagination and support for wider-ranging climate change mitigation strategies. But beyond mere infrastructural changes there may also be value in moving away from the stance that accepts our economic system as the only way things can be. Imagination and flexibility, inspiring visions on a hereto unknown scale, are required in order to implement political and economic alternatives (Maniates, 2001).

Omissions

As mentioned at the outset of this discussion, the relevance to my research of the concept of silence and omissions (Zerubavel, 2006) has increasingly dawned on me. Studying omissions may pose different challenges than other fields of research, as there are difficulties concerning how to study something that is not occurring. Research which examines the failure to reduce emissions studies something that is *not* happening, the absence of a phenomenon - whether that be critical engagement with capitalism, protests, large-scale infrastructure and social change - or other attempts to mitigate climate change. Zerubavel (2006) succinctly summarised the difficulties of studying conspiracies of silence in this way:

> … they typically consist of nonoccurrences, which, by definition, are rather difficult to observe. After all, it is much easier to study what people do discuss than what they do not (not to mention the difficulty of telling the difference between simply not talking about something and specifically avoiding it). (p. 13)

The overall failure of the 'knowledge' of, and discussions about, climate change to result in a large scale public outcry and reductions in emissions is a testament to the fact that, we might to some extent, be living in denial. As explored by Norgaard (2011) and supported by the findings on Californians' perception of the drought, one factor may relate to the social production of distance and individualism:

> In the absence of a well-developed sociological imagination that connects individuals to society and the local to the global, private or local troubles look merely personal rather than political, and their consequences seem less significant. Although such constructions of the local feel natural, they are a way of "not seeing" that has powerful implications for social action. (p. 100)

Some people in California did notice changes, felt emotional reactions and reported changes in behaviour. But others did not feel that drought impinged upon their own life and it felt as yet 'abstract'. Thus, in some cases, it is not only that people keep climate change at a distance, but also experience climate change's more local expression in the form of drought, as distant.

The findings from all the research reported here highlight the extent to which climate change is a social issue. This is both because emissions are caused by human activities (such as industrial production) and because the responses to climate change are social in nature. Different responses towards climate change mitigation were highlighted in chapter 2. The variety of social responses was also exemplified in the different ways in which the meaning of drought and climate change was interpreted in California (chapters 4 and 5). This emphasis on the social factors surrounding climate

change is relevant, given that there has been criticism of a lack of integration between the social and natural sciences and climate change related institutions:

> … neither the IPCC nor the ACC [America's Climate Choices] reports consider the importance of the myriad other aspects of social organization and culture: governance, power structures, political activism, labor policies, the countless drivers of consumption, the force of social routines and expectations, systems of global production, cultural values, and a range of other sociological factors that shape and constrain mitigation opportunities apart from technologically focused solutions. (Ehrhardt-Martinez, Rudel, Norgaard & Broadbent, 2015)

Worldviews, values and belief systems

Believing in the evidence of climate change is far more than one particular belief. Chapters 2, 4 and 5 highlighted in different ways that beliefs about climate change are part of a whole range of worldviews and belief systems. This recognition was especially striking in California. There were particular cultural beliefs, values and norms which were mentioned when explaining attitudes towards both the drought and climate change, which highlighted the importance of frameworks of reference, such as a faith in God's greater plan or belief in conspiracy theories. It showed how people's views of the world are already so completely different from each other, that people are unlikely to be convinced by scientists with whom they may share few other beliefs about how the world works. Different worldviews (unrelated to climate change) mean that people may have such different explanations of how and why things happen in the world, that they have too little in common to agree on one way of understanding climate change (see also Callison, 2014; Hulme, 2009).

The importance of our worldviews in influencing how we understand climate change, is in line with the present findings on people's different perceptions of the drought. Similarly, Cochran (former chair of the ICC, interviewed in Callison, 2014) discussed the importance of different ways of talking about the world and worldviews:

> I don't mean different Native languages, but the way we use common everyday language. And then the other piece of that is the Native worldview. All things are connected, and so to take one piece of a problem and not connect it to the rest of the world and the environment around? It just logically makes no sense. How can we talk about changes in weather without talking about changes in vegetation or the air or the people or the animals, as all of those things are part of a natural mix. All things are connected in our universe. (p. 46)

The above quote about worldviews also relates back to the relevance of conceptions of nature which treat humans and the environment as separate (Ingold, 2000). Some

examples of this appeared in chapter 2 where human and economic interests were discussed as separate from environmental protection. A short-term priority given to the economy, however, fails to acknowledge that climate change would ultimately affect the economy.

Values were also discussed by Beck (1992) in relation to definitions of risk and understanding of science. He pointed towards the role of values in defining acceptable levels of risk and in prioritisation. Klein (2014) drew a comparison to the change in values during the abolition of slavery (although there are differences which she acknowledged): "As the historian David Brion Davis writes, abolitionists understood that their role was not merely to ban an abhorrent practice but to try to change the deeply entrenched values that had made slavery acceptable in the first place" (p. 463). Climate change may require a major transformation in moral perception, or as Klein (2014) formulated it:

> … any attempt to rise to the climate challenge will be fruitless unless it is understood as part of a much broader battle of worldviews, a process of rebuilding and reinventing the very idea of the collective, the communal, the commons, the civil, and the civic after so many decades of attack and neglect. (p. 460)

Reflections on the research method

I became very aware of how the research process that I chose for the California fieldwork was dependent on me being a white woman, because approaching strangers in the street and asking them to engage could have been more difficult if I was a person of colour. The responses and people I got to engage with me will have been influenced by my socio-demographic background.

The qualitative research had an impact on me and maybe on my participants. For me, it was interesting to interview people about the drought and many participants also thanked me for an interesting conversation, sometimes adding their intention to further think about certain questions. Similarly, for the interviews reported in chapter 2, people around me were invited to discuss what should be done about climate change, in line with Callison's (2014) proposal that: "For wider publics, what flows from the "so what" question is a drive to know and understand more, to do something, to adopt a position, to be part of discussions about what *ought* to be done" (p. 246).

Reflections on the role of the researcher

My role as the researcher was to establish what research there is on people's responses to climate change in order to examine where there may be gaps and how, specifically, research on reactions to climate change in the discipline of Psychology could be expanded. I began by asking what would need doing to seriously mitigate climate change. Questions of how to significantly reduce carbon emissions led me back to issues of how we organise the economy and modes of production, since emissions and economic processes are closely entwined (Clark & York, 2005; Ockwell, 2008). Further, the existing growth-based economic model influences consumption and lifestyle decisions, which are often the focus of psychological research on the relationship between human behaviour and environmental issues. Swim et al. (2009) suggested: "…characteristics of individuals that influence their ability and motivation to engage in consumption including many psychological constructs related to environmental consciousness, such as attitudes and values, have been the focus of much research on predictors of environmentally responsible behaviors" (p. 35). Economic and larger political structures' influence on cognition and behaviour are rarely considered in the psychological literature. For example, the recent American Psychological Association's task force report on climate change (Swim et al., 2009) mentioned capitalism just once and that was in reference to a paper by Kasser, Cohn, Kanner and Ryan (2007) in which the authors criticised Psychology's lack of engagement with economic structures. Instead the report asked: "What are the human behavioral contributions to climate change and the psychological and contextual drivers of these contributions?" (p. 29) and, in response, discussed mainly population and consumption issues. Psychology's remit of response to the issue of climate change was identified predominantly as relating to the topics of increased population and consumption.

When I set out to conduct the research for my PhD I questioned how to combine psychological research with the bigger picture of economics and societal structures. The critiques emerging in some sociological literature regarding individual behaviour change in consumption and lifestyle (discussed in more detail in chapters 1, 2 and 3) posed one such possibility, as that literature discusses the relationship between individuals and surrounding societal structures. My role as the researcher was influenced by my personal political interests in trying to understand the bigger picture and to examine and address the root causes of problems. In light of a currently somewhat depoliticised psychological academic approach to climate change research,

which is 'biased' in the sense that it continues to tread the line of the status quo, there seemed to be a particular need for a more critical and politically aware approach to research.

My research in California developed out of some of the explanations for inaction on climate change that I had come across both in my first set of interviews in England and from academic readings. It was being suggested that people needed to be exposed to the effects of climate change for serious emission reduction efforts to begin. When I came across the news reports on the recent California drought, some of which were reporting the drought as linked to climate change, this sparked the idea of examining people's experience of the drought and their views on climate change in California as a case study of what happens when people live through a local impact of climate change. Further, when I started looking into the existing literature I realised that there was mainly survey research on this topic, while there were only a few examples of interviews with or ethnographies of people living in areas affected by climate change, especially in industrialised countries. Here again, my political interests in social and environmental justice led me to read academic literature discussing how countries in the global North are mostly responsible for large quantities of past and present carbon emissions, while countries in the global South would feel the consequences and have less potential to mitigate climate change and fewer resources to adapt to climate change (Byrne, Martinez & Glover, 2002; Klein, 2014; Norgaard, 2011; Parks & Roberts, 2006; Stoddart, Tindall & Greenfield, 2012). With greater responsibility for climate change and greater potential to reduce emissions in the global North, it seemed particularly pertinent to study perceptions of climate change that might lead to a change in behaviour or politics in an industrialised country such as the USA. So in the research for all my chapters my personal interests in left-wing politics influenced the academic literature that I read, research questions and research design that I developed.

In terms of data collection I tried not to let my political views become apparent in the interview questions and interviews, so as to encourage the participants to feel they could speak freely. I tried to remain open and friendly and to create a space in which the participants could voice their views honestly. I had the impression that this worked, since I gathered a range of opinions both in the interviews in England (reported in chapter 2) and during the interviews in California (reported in chapters 4 and 5). I did not get the impression that people were just telling me what they might have expected

me to 'want to hear'. However, there will have been certain questions, such as asking what, if anything, participants thought should be done to address climate change, which will have implied, that I as a researcher assumed climate change to exist. Further, it is likely to have implied to participants that I as a researcher believe that something should be done. But these were 'assumptions' I was conscious of and willing to make and bring into my research, since climate change does exist (as outlined in chapter 1). Additionally the interview question was formulated as follows: "What do you think should be done in order to reduce the degree of climate change, *if anything*?" to leave the option open for participants to discuss if and why they did not think anything needed doing to mitigate climate change.

Further, in my research in California I tried to interview people from different backgrounds and with different opinions. For example, I asked people in different locations, such as parks, cafés, bus stops and did indeed interview a range of people, such as teachers, gardeners, fire fighters, unemployed people, homeless people, and youth workers. I acknowledge that my political leanings and my personal characteristics (e.g., being a white middle-class woman) are still likely to have influenced how people interacted with me and what kind of responses they might have given. Nonetheless, I spoke to people of different political leanings to myself and was at least just as curious and open to hearing what they would say, as to any of the other participants. Participants often gave lengthy and very different answers from what I might say or 'want to hear'.

In the way that my political views influenced the research questions and design and the actual interview questions, they will also have influenced the data analysis, since this also links back to the research questions, i.e. data analysis occurs partly in light of the research questions and interview questions asked. Further, my particular interests in questions about the role of the economic system of capitalism will also have influenced my data analysis, such as examining what kinds of critiques participants voiced of corporations and the profit motive. Nonetheless, I would argue that my interests did not bias data analysis apart from highlighting particular themes, since the extracts presented were present in the data and my aim was to present the data accurately. Moreover, throughout my work I have been transparent on the approaches and readings that have influenced my work and on the views I hold, which are relevant

to my work and might have influenced it. The reader can therefore engage with and assess my work and the presentation of my data, as well as the analysis.

Strengths and weaknesses of different methodological decisions

Chapter 2 presents a study drawing on interviews which followed a semi-structured interview schedule and all interviews were held in a private study room in a university library. The methodological decision of employing interviews for data collection was key to the design of this study, since the aim was to explore in depth how participants talked about different actors' responsibility and different possibilities for climate change mitigation. Interviews made the most sense to achieve this research aim, since I wanted to examine what kind of suggestions came to participants' minds, thus requiring an open-ended technique and precluding any form of multiple choice questionnaire procedure. Further, I wanted to be able to follow up on what participants had said, therefore the semi-structured approach was well-suited. Additionally, part of the data analysis focused on how people talked about certain topics and what kind of assumptions were taken for granted, which also required qualitative interviews rather than questionnaires with pre-existing response options. One of the methodological weaknesses of this study was that of using two different researchers to interview participants. The research assistant who helped me by conducting several interviews was unsurprisingly not as involved in the research literature, design and aims of the study as I was. This meant, for example, that the research assistant did not follow up with questions as extensively as I would have if I had been the interviewer.

For the studies reported in chapter 3, it could be argued that one of the methodological weaknesses was to employ experimental methods. This is because the nature of some of the sociological literature's critique (e.g. Brulle, 2010; Shove, 2010), which these studies were based on, also pertains to methodological issues in Psychology, such as experimental methods and survey methods (like that used for Theory of Planned Behaviour research) and assumptions about measurable predictors and outcomes. Shove (2010) argued that the: "… interpretation both of the problem (one of consumer behaviour and choice) and of potential policy responses (influencing choice) structures the meaning and the method of useful social science" (p. 1280). The author argued that certain theoretical approaches underlying different methods of research do not combine well for synthesis:

> On all the counts that matter, social theories of practice on the one hand, and of behaviour on the other, are like chalk and cheese. Whereas social theories of practice emphasise endogenous and emergent dynamics, social theories of behaviour focus on causal factors and external drivers. Likewise, people figure in the first case as carriers of practice and in the second as autonomous agents of choice and change. It is useful to be clear about the incommensurability of these contrasting paradigms, and hence about the impossibility of merger and incorporation. (p. 1279)

The critique of individual behaviour change theories is that they are based on psychological theories, such as the theory of planned behaviour which treat people as rational processors in which behaviour can be quantified and theorised as the outcome of a formula taking account of beliefs, attitudes, intentions and some variation of another variable. Shove (2010) criticized this approach for compartmentalizing and decontextualizing attitudes and behaviours, which she argued occurs in such behavioural theories and equally in studies using quantitative methods that are based on them. Therefore, using experimental methods, which are part of the critique that Shove (2010) voiced about individual behaviour change approaches to environmental problems, is arguably to miss the point. Other methodologies, such as ethnographies would have been better suited to examine a research question and study based on these sociological critiques to the individual behaviour change approaches. A large part of the reason why I used experimental methods had to do with the fact that these were the methods available to me, as they are what I had learned and what is common and accepted within Psychology. I had little knowledge or experience of ethnographies. In line with this I did not know how to design a study using ethnographic methods to empirically examine the critiques mentioned by the likes of Brulle (2010), Kent (2009), Maniates (2001), Shove (2010) and Webb (2012). However, I acknowledge the flaw of using experimental methods for such an investigation and future research could explore the possibilities of examining the extent to which individual behaviour change messages detract attention and support from structural level changes using other methods.

For the research in California I again employed semi-structured interviews, however, this time I adapted the questions more flexibly than the semi-structured interview schedule reported in chapter 2. This was because I approached the interviews more conversationally, as they occurred in different settings in public spaces and therefore I had to adapt them to the situation and the length of time that I thought I would have to engage with each participant. Further, the setting was different for each

participant which meant the place where each interview took place was less formal than for the interviews reported in chapter 2, which all took place in a similar looking room and a quiet, private space in a university library. Being flexible with the setting and the interview questions meant that I could more easily adapt to and use more opportunities of interviewing people in various spaces. It also meant that I could access a greater range of people spontaneously when it suited them in their own time and space. Further, interviews were easier to conduct than an ethnography, which might have provided a more extensive insight into the research topic, but which would have required more training and time on my part and was therefore beyond the means of my PhD. Interviews were more suited to examining the research questions than closed or even open-ended survey questions would have been, since I wanted to be able to follow up in more depth on the responses participants gave.

Overall, these methodological considerations will influence the work I conduct in future as I have become more aware of the benefits and disadvantages of different methods to examine various research interests and I will continue to reflect on how to best work with my political leanings in academic and research contexts.

Reflections on the role of science

In her examination of the meaning-making process of climate change across different groups, Callison (2014) noted that: "Climate change provides exemplary insight into how scientists *and* journalists are negotiating professional detachment and distance…" (p. 3). The negotiation of detachment is especially relevant in the context of climate change debates where advocates are frequently attacked by climate change sceptics and lobbying think-tanks as to the veracity of their claims and accused of alarmism (Callison, 2014). Oreskes (2004) suggested that many scientists responded by trying to deliver the necessary evidence or 'proof'. The author argued that this response was misguided, as it was rarely scientific proof which was at stake in a disputed environmental issue (Oreskes, 2004).

The underlying assumption of efforts to persuade people about climate change using science narratives, is that the objective, detached facts speak for themselves and will necessitate action or transformation of society (Callison, 2014). But as the present research highlighted, there are many other factors which moderate how the evidence and relevance of climate change are interpreted. The gap left by the scientific process,

differences in the latter and inherent uncertainty, will be capitalised on, if the results have religious, economic or political consequences (Oreskes, 2004). Therefore, it seems that to communicate the reality and relevance of climate change and to encourage climate change mitigation will require more than the presentation of scientific facts. As highlighted by the present research the role of socially dominant narratives and 'solutions', beliefs, emotions and worldviews are also relevant. Since scientific 'facts' about climate change do not speak for themselves (Callison, 2014) specific interpretations and courses of action require articulation.

Academics can continuously double check and question the assumptions, topics, methods and approaches used in order not to perpetuate a silence around currently less favoured alternatives to climate change mitigation. This is consistent with Zerubavel's (2006) suggestion that: "As one might expect, what we ignore or avoid socially is often also ignored or avoided academically, and conspiracies of silence are therefore still a somewhat undertheorized as well as understudied phenomenon" (p. 13). In the context of the destructive status quo of industrial production, adding daily to greenhouse gas emissions, the relevance of 'sins of omission' is highlighted. It seems that threats are often conceptualised as arising from a harmful action, i.e. the notion of 'sins of commission', but in this case it is inaction, or business as usual, that poses a danger (which is an understatement).

Higher Education

If researchers are pressured to produce 'realistic' policy-focused and impact-oriented research, are we in danger of toeing the dominant line, although it is precisely that which is in need of questioning and undermining? How can we develop research questions, designs, and findings which contradict the actions of government and corporations, when we increasingly depend upon them for our funding? One of the first decisions Theresa May made when she became prime-minister was to abolish the Department for Energy and Climate Change and reallocate responsibility for climate change to the new Department for Business, Energy & Industrial Strategy (Johnston, 2016). Producing more policy advice for such politicians or governments does not seem particularly useful in terms of climate change mitigation. There is ample scientific evidence on the reality of climate change, communication literature on how to communicate about climate change and the technology to reduce emissions, but in the

absence of a political will or force to base actions on this knowledge, efforts towards change (e.g., through reform and government) seem futile.

Closing thoughts

Since starting my research, I no longer view climate change just as an idea that is interpreted differently (according to the suggestion by Hulme, 2009). Instead, I have come to see it as a *form of life*, as proposed by Callison (2014), because climate change has involved and will involve physical and social changes that impact on how people live.

Studies exist concerning the public lack of understanding, lack of concern, lack of action, but there is little indication as to what action is absent, i.e. to imagine and describe the omissions. My research has indicated that more alternative strategies to mitigate climate change require formulating and discussing in public (chapters 2 and 3). Additionally, drought and climate change are experienced and viewed differently depending on various factors, which need taking into account when discussing climate change mitigation, such as the influence of previous beliefs (chapters 4 and 5). Climate change mitigation hinges on questions of what ought to be done. Ultimately, the aim of convincing people about climate change is to persuade them to take action: But what form should that action take? What would a reasonable or effective response to climate change look like? And what are we ourselves doing? There seems to be little articulation of what action on climate change should look like or constitute and perhaps this is exactly the imagination (Norgaard, 2017) or formulation of responses that needs to be ignited. Some hope may be derived from already existing social movements, as Klein (2014) suggested:

> Climate change does not need some shiny new movement that will magically succeed where others failed. Rather, as the furthest-reaching crisis created by the extractivist worldview, and one that puts humanity on a firm and unyielding deadline, climate change can be the force—the grand push—that will bring together all of these still living movements. (p. 459)

Mitigating climate change might require many people to start imagining that another world is possible and to begin creating it.

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Appendix A

Semi-structured interview schedule for research reported in chapter 2.

What do you think should be done in order to reduce the degree of climate change, if anything? (If answer not clear or too abstract ask How? Examples? Please specify.)

Depending on the answer different follow up questions:

a) Why not?

b) What impact do you think that will have?

c) To what extent do you think that will be sufficient to reduce the degree of climate change? If not, what else do you think needs doing?

d) To what extent do you think you yourself should be doing these things that you have suggested? /What do you think your role is? (If nothing, ask why not) / What is stopping you from doing some of those things (beyond the ones that you may already be doing)?

e) What do you think other people should be doing? (For example friends, family, colleagues)

f) How does one get people to do those things you have suggested? What ideas do you have?

g) What role do you think the British government should play in reducing the degree of climate change?

h) What role do you think governments across the world should play in reducing the degree of climate change?

i) What role do you think corporations should play in reducing the degree of climate change?

j) Do you think that the suggestions you have made will be "enough" to "significantly" reduce the degree of climate change? If not, what else do you think needs doing to reduce the degree of climate change?

k) How can it be done? By whom?

What is your age? Occupation? Gender?

Appendix B

Attitudes and beliefs 2015 - *Study 1*

Introduction

You are being invited to take part in a research study investigating attitudes and beliefs in early 2015. The data from the study will be used by you as part of your practical assignment on the C8035 'Social Psychology' module. It will also contribute to a PhD research project.

It is entirely up to you whether or not you take part in this research. Clicking the continue button below indicates that you consent to participating in the study.

(If you don't wish to take part, you will be given a hard copy of the questionnaire to look through, so that you can familiarize yourself with the questionnaire items.)

If you take part, you will be asked about your attitude towards a topical issue and a number of related questions. This should take no more than 20-25 minutes to complete. Once everyone in the class has completed the questionnaire, there will be a discussion of the key features of the questionnaire.

The questionnaire is completed anonymously (your name is not required). All the information that you provide will be kept strictly confidential and will be treated in accordance with the Data Protection Act (1998). Any identifying information such as age and gender will be removed from the datafile that will be given to students.

Prior to completion of the questionnaire you can withdraw from the study by closing the browser.

This short study has been approved through the Sciences and Technology Cross-Schools Research Ethics Committee (C-REC approval ER/HAFD4/13), which can be contacted directly via email (c-recpsysci@sussex.ac.uk). If you have any other concerns about the research, please contact me at p.sparks@sussex.ac.uk.

At the beginning of the questionnaire there was a section of questions based on the theory of planned behaviour, the results of which will be reported elsewhere.

Action impact condition

30. If a person turns down their thermostat where they live, how much impact do you think that particular action will have in reducing climate change?

- ○ no impact at all
- ○ negligible impact
- ○ very little impact
- ○ little impact

○ a lot of impact
○ a huge impact

This same response scale was used for questions 31 - 40.

31. If a person switches off appliances that aren't in use where they live, how much impact do you think that particular action will have in reducing climate change?

32. If a person switches to a renewable energy provider where they live, how much impact do you think that particular action will have in reducing climate change?

33. If a person eats little or no meat from now on, how much impact do you think that particular action will have in reducing climate change?

34. If a person eats few or no dairy products from now on, how much impact do you think that particular action will have in reducing climate change?

35. If a person buys and cooks only what is needed to avoid food waste from now on, how much impact do you think that particular action will have in reducing climate change?

36. If a person reuses, recycles, repairs or borrows more often (rather than buying new) from now on, how much impact do you think that particular action will have in reducing climate change?

37. If a person flies less often from now on, how much impact do you think that particular action will have in reducing climate change?

38. If a person cycles more often from now on, how much impact do you think that particular action will have in reducing climate change?

39. If a person takes public transport more often from now on, how much impact do you think that particular action will have in reducing climate change?

40. If a person buys 'local' food more often from now on, how much impact do you think that particular action will have in reducing climate change?

Beneficial individual action condition

Which one of each of the following pairs of behaviours is better for a person to engage in in order to reduce climate change? (tick either 'A' or 'B' for each pairing)

30. ○ A. Turning down the thermostat where they live
○ B. Not turning down the thermostat where they live

31. ○ A. Switching off appliances that aren't in use where they live
○ B. Not switching off appliances that aren't in use where they live

32. ○ A. Switching to a renewable energy provider
○ B. Not switching to a renewable energy provider

33. ○ A. Eating little or no meat
○ B. Not eating little or no meat

34. ○ A. Eating few or no dairy products
○ B. Not eating few or no dairy products

35. ○ A. Buying and cooking only what is needed to avoid food waste
○ B. Not buying and cooking only what is needed to avoid food waste

36. ○ A. Reusing, recycling, repairing or borrowing more often (rather than buying new)
○ B. Not reusing, repairing or borrowing more often (instead buying new)

37. ○ A. Flying less often
○ B. Not flying less often

38. ○ A. Cycling more often
○ B. Not cycling more often

39. ○ A. Taking public transport more often
○ B. Not taking public transport more often

40. ○ A. Buying 'local' food more often
○ B. Not buying 'local' food more often

Control condition - no manipulation statement

Dependent variables

To what extent do you agree or disagree with the following statements?

41. "Protection of the environment should be given priority, even at the risk of curbing economic growth"

○ Very strongly disagree
○ Strongly disagree
○ Slightly disagree
○ Neither disagree nor agree
○ Slightly agree
○ Strongly agree
○ Very strongly agree

The same response scale was used for questions 42 - 58.

42. "Economic growth should be given priority, even if the environment suffers to some extent"

43. "The government's main priority should be to focus on growing global economic problems"

44. "The government's main priority should be to focus on growing environmental problems"

45. "The government should introduce green taxes to discourage actions that harm the environment"

46. "The government should introduce measures such as green taxes now"

47. "In its search for continuous growth, the current economic system is increasingly becoming a destructive force that is stimulating climate change, resource scarcity, growing inequality, and biodiversity loss on an epic scale"

To what extent do you agree or disagree that the following should do more to reduce climate change?

48. Your local council should do more to reduce climate change

49. Your member of parliament should do more to reduce climate change

50. Corporations and industry should do more to reduce climate change

51. The UK government should do more to reduce climate change

52. Individual citizens should do more to reduce climate change

53. I intend to vote for pro-environmental candidates.

54. I intend to sign petitions supporting environmental protection.

55. I intend to write to politicians/newspapers in support of environmental protection.

56. I intend to donate to environmental organizations.

57. I intend to join environmental/political groups.

58. I intend to take part in a protest or demonstration about an environmental issue.

59. What is your gender? (Please note that this information will not appear on the data file that you and other students will have access to.)

60. What is your age? (Please note that this information will not appear on the data file that you and other students will have access to.)

61. What is your nationality? (If you have dual nationality and would prefer to mention both nationalities please specify them below.)

Thank you for participating in this study.

Appendix C

Views on Current Topics - *Study 2*

Similar demographic information as in Study 1 was also obtained in study 2. Participants were provided with information on the study at the outset and asked for their consent. At the end of the study they were thanked.

Large impact condition

Please read the following information carefully and then answer the questions that follow it:

There are many ways in which people can help reduce climate change: for example by recycling, turning down their thermostat, driving and flying less and buying local food produce. These kinds of behaviour changes have been shown to have a large impact in reducing national carbon emissions.

4. I have read the above information carefully. (You will be asked questions relating to this).
○ No
○ Yes

Very little impact condition

Please read the following information carefully and then answer the questions that follow it:

There are not many ways in which people can help reduce climate change; it is not as simple as recycling, turning down their thermostat, driving and flying less and buying local food produce. These kinds of behaviour changes have been shown to have very little impact in reducing national carbon emissions.

4. I have read the above information carefully. (You will be asked questions relating to this).
○ No
○ Yes

Control condition - no manipulation statement

Additional dependent variables *(only those not used and already reported for Study 1):*

Please indicate to what extent you would oppose or support the introduction of the following measures in the UK:

5. Increased government spending on improving public transport within towns and cities
○ Very strongly oppose

○ Strongly oppose
○ Slightly oppose
○ Neither oppose nor support
○ Slightly support
○ Strongly support
○ Very strongly support

The same response scale was used for questions 6 - 17.

6. A reduction in government spending on the military

7. Cheaper public transport through increased government subsidies

8. An immediate removal of all government subsidies to the fossil fuel industry

9. The introduction of a tax on airline fuel

10. Government subsidies for improving the insulation of homes

11. The introduction of a complete ban on coal mining

12. Charging companies and industries that are environmentally damaging (e.g., in the form of a pollution tax)

13. Government legislation to prevent airport expansion

14. The introduction of a complete ban on oil drilling

15. Introducing further government subsidies for renewable energy production

16. Government legislation to prevent road expansion

17. A complete ban on fracking (the extraction of oil and natural gas through hydraulic fracturing)

To what extent do you disagree or agree with the following statements?

18. "I believe the economic system needs to change in order to reduce climate change."
○ Very strongly disagree
○ Strongly disagree
○ Slightly disagree
○ Neither disagree nor agree
○ Slightly agree
○ Strongly agree
○ Very strongly agree

The same response scale was used for questions 19 – 57 and 59.

19. "I think fundamental changes to the political system need to be made in order to reduce climate change."

20. "I think that climate change can be reduced by shifting away from economic growth towards an economy based on everyone's needs."

21. "I think that existing power relations need to change in order to address climate change."

22. "I consider the profit-oriented economy to be greatly responsible for causing excessive carbon emissions."

To what extent do you disagree or agree with the following statements?

23. "I believe that economic, social and environmental problems can be addressed together."
24. "I think that the well-being of the natural environment can be achieved without economic growth."

25. "I think that social well-being can be achieved without economic growth."

26. "I believe that environmental and social justice are interrelated."

To what extent do you disagree or agree that you intend to engage in the following actions in the future?

46. I intend to improve the insulation where I live.

47. I intend to turn down the thermostat where I live.

48. I intend to switch off appliances when they are not in use.

49. I intend to switch to a renewable energy provider.

50. I intend to eat less or no meat.

51. I intend to eat less or no dairy products.

52. I intend to buy only what is needed to avoid food waste.

53. I intend to reuse, recycle and repair rather than buying new goods.

54. I intend to fly less often.

55. I intend to cycle more often.

56. I intend to take public transport more often.

57. I intend to buy local food more often.

58. Did the information you read at the beginning of the study indicate that individual people's behaviour change has a large impact or very little impact in reducing national carbon emissions?

○ A large impact
○ Very little impact

59. To what extent do you disagree or agree with the following statement? "There are not many ways in which people can help reduce climate change; it is not as simple as recycling, turning down their thermostat, driving and flying less and buying local food produce. These kinds of behaviour changes have been shown to have very little impact in reducing national carbon emissions."

Appendix D

Attitudes and beliefs 2016 - *Study 3*

Similar demographic information as that obtained in Studies 1 and 2 was also recorded in Study 3. Participants were also provided with information, asked for their consent at the beginning of the study and thanked at the end.

Structural change condition

Climate researchers maintain that structural changes are crucial in making the difference to reducing climate change. These kinds of transformations include government investment in renewable energy production while reducing fossil fuel extraction, cheaper and improved public transport and funding for insulated housing. For example, for the first time this summer renewables made up over a quarter of the UK's power mix. All the clean technology being built meant renewables became the second largest electricity source.

4. I have read the above information carefully. (You will be asked questions relating to this).
○ No
○ Yes

Individual action condition

Climate researchers maintain that people engaging in pro-environmental actions is crucial in making the difference to reducing climate change. These kinds of actions include recycling, turning down thermostats and switching off unused devices, using less electricity, eating less meat, and flying and driving less. For example, figures show that 8% of the total electricity used in UK homes comes from appliances left on standby, which is the equivalent of around two power stations' worth of electricity each year.

4. I have read the above information carefully. (You will be asked questions relating to this).
○ No
○ Yes

Control condition - no manipulation statement

The dependent variables consisted of an adaptation of those provided in Studies 1 and 2.

Appendix E

Interview schedule for the research reported in chapters 4 and 5.

This is a semi-structured interview schedule and follow up questions varied depending on the participants' responses.

Section 1: Experiences of drought and water regulation

1. To what extent have you perceived there to be a drought occurring in California (specify exact region)? For how long?

2. To what extent have you felt affected by the drought?

3. Have you changed any of your water usage practices/habits?

4. Have you heard of and what do you think about the introduction of the 25% water reduction in urban areas?

5. To what extent have you been affected by these new regulations introduced in June 2015?

6. What do you think the local government should be doing to address the drought/water shortage?

Section 2: Opinions on climate change

1. Do you think that climate change is occurring? Do you think it is caused by human emissions? Why/Why not?

2. To what extent do you think the current drought is linked to climate change?

3. If yes to some extent: When/How did you first come to think that there is a link (e.g., read a news report?)

4. If yes: To what extent do you think that you are personally being affected by climate change?

5. Do you think that the experience of the drought has changed your opinions of climate change? If so, how?

6. What do you think is driving current emissions? What do you think would need to change in order to reduce emissions and thereby climate change?

7. To what extent do you think the economic system (growth, profit motive, free trade) plays a role in climate change?